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MESSAGE FROM THE CHAIRPERSONS

Dear IEEE SENSORS 2015 participants, welcome to Busan, South Korea!

On behalf of the Organizing committee of the 14th IEEE SENSORS Conference, it is a great honor and pleasure to welcome you to the Republic of Korea and to the city of Busan, the 2nd-largest city and the #1 trading port in Korea. For the conference venue we have selected BEXCO, a world class conference & exhibition center.

IEEE SENSORS 2015 is honored to have as a technical co-sponsor the Korean Sensor Society (KSS), under the leadership of Shinwon Kang. The partnership with KSS began with the 2012 submission of a bid package to the IEEE Sensors Council for the 2015 SENSORS conference. The selection of KSS and Busan, South Korea started a long partnership, the highlight of which is the IEEE 2015 SENSORS conference.

The Korean Sensors Society is a non-profit, non-political, and learned society in the ROK with a 24-year history that supports scientific activities in sensor- and actuator-related sciences including readout and control circuit technologies. KSS supports an annual national conference and symposium, and publishes *Journal of Sensor Science and Technology* published in Korean and English, respectively.

2015 is a year of firsts for IEEE SENSORS, with several exciting additions to the conference: (1) a full-day Industry Program organized by Industry committee chairs Chae Deok Lee and Sri Chandrasekaran; (2) live sensor demonstrations under the leadership of Sandro Carrara; (3) technical tours on Thursday following the conference, organized by committee chair Seok Jin Yoon and local chair Wan-Young Chung; and (4) extensive Social Media communications led by social media chair Frederick Livingston. Following the success of recent years, a Young Professionals reception will again be held on Monday afternoon, hosted by Sensors Council Young Professionals Rep Sinead O'Keefe and other Council leaders. If you are within 15 years of your first degree please join us for this networking event.

The number of abstract submissions, 950++, is close to the all-time record of 1092 (2009). The acceptance rate is <60%. Of the 533 accepted papers, 272 will be presented in oral and 261 in poster sessions. Poster and oral paper submissions went through identical peer reviews. The papers are presented as a poster or paper depending on where the paper best fits into the technical program.

The success of a conference depends not only on the technical program but also on the social program. The highlights of this year's social program will be the welcome reception at the Paradise hotel on the beautiful Haeundae Beach. The BEXCO Center was chosen for the exceptional banquet facilities accommodating the large number of dinner guests, and the live entertainment stage and sound equipment. Banquet entertainment includes a local mix of three Korean performances; Lion Dance, Korean traditional performance with 4 different musical instruments and also mixture of Korean traditional songs and dance with b-boying.

Thanks to all the volunteers who contributed! The technical core of the conference excels because of the authors who are sharing their technical research and knowledge with the professional community. However, the reality of IEEE SENSORS 2015 is due to the dedication of more than 270 volunteers that have worked for years to bring this conference to kick off in Busan. The Technical Program Committee (TPC) alone consisted of 220 volunteers. We especially appreciate the efforts of our Technical Program Chairs: Srinivas Tadigadapa and Junghoon Lee. Please review the following pages to see the list of other significant contributors, including 26 track chairs, chairs of Tutorials, Special Sessions, Publicity, Exhibits, Student Paper Awards, Publications, and Fundraising, as well as the Conference Treasurers and Secretary.

We wish to recognize and sincerely thank our esteemed Keynote Speakers: Dr. Suntae Jung of Samsung Electronics, Korea; Prof. Uwe D. Hanebeck of Karlsruhe Institute of Technology, Germany; and Prof. Andrew Cleland of University of Chicago, USA; whose participation in this conference is invaluable. We appreciate their expertise and willingness to share their time with us in Busan, and look forward to their stimulating visionary talks with great anticipation.

We also wish to thank the professional conference organizers of Conference Catalysts, LLC, under the leadership of Chris Dyer. Lauren Pasquarelli served as the Conference Catalysts lead for this conference, and everyone involved appreciates her focus and determination to keep this conference on schedule and within budget.

IEEE has more than 426,000 members in more than 160 countries worldwide, more than 117,000 student members. IEEE has 39 societies and six technical councils representing the wide range of IEEE Technical interests. IEEE SENSORS conference is sponsored by the IEEE Sensors Council, which has 26 member IEEE Societies. The Council is a multidisciplinary technical area of mutual interest, which promotes the sensors field primarily through conferences and publications.

IEEE SENSORS is the flagship conference of the IEEE Sensors Council. The international location rotates geographically on a three year cycle; 1. Asia/Pacific, 2. Americas, 3. Europe/Africa. Next year, IEEE SENSORS will be held in Orlando, FL, USA, 3 to 6 November 2016. In 2017, IEEE SENSORS will be held in Glasgow Scotland.
We hope to see you in Orlando & Glasgow!

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General Co-Chair

Srinivas Tadigadapa
Technical Program Co-Chair

Junghoon Lee
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GENERAL INFORMATION

Registration & Information Desk
The Registration and Information Desk is located in the 1F lobby. Registration hours:

Sunday, November 1	7:30 -18:00
Monday, November 2	7:30 -18:00
Tuesday, November 3	8:00 -18:00
Wednesday, November 4	8:00 -17:30

Meeting Room Locations
Concurrent Sessions A: Room 201
Concurrent Sessions B: Room 202
Concurrent Sessions C: Room 203
Concurrent Sessions D: Room 204
Concurrent Sessions E: Room 206
Concurrent Sessions F: Room 207
Concurrent Sessions G: Room 208
Poster Sessions: Rooms 101-110

Name Badges
Name badges are required for access to all Conference events.

Electronic Proceedings
One copy of the electronic proceedings will be provided to each attendee on a flash drive. Additional copies may be purchased at the Conference registration desk. The purchase price of the electronic proceedings will increase after the Conference, so be sure to order your additional copies in advance. In addition to the proceedings on the flash drive, a download option is also available to attendees during the week of the Conference.

Message and Job Market Board
The Message and Job Market Board will be located near the Conference registration desk. Posting is allowed by job seekers. Recruiters are not allowed to post.

Conference Attire
Attire during the duration of the Conference is business casual.

Coffee Breaks
Coffee and light snacks are available each morning and afternoon to registered attendees. Conference breaks are located in the 2F lobby.

Lunches
Lunch is provided each day to Conference registrants in the 3F Grand Ballroom. Tickets are provided in attendee badges. Attendees are required to remit a valid lunch ticket for entrance.

Cellular Phones
As a courtesy to fellow attendees, please silence electronic devices.

WiFi
WiFi access is available to attendees. Login information is available at registration.

GENERAL INFORMATION

Local Information
The Busan Tourism Organization and Korea Tourism Organization booths are located on the 1F and will be open during registration hours.

Smoking
BEXCO is a non-smoking facility. Please use designated smoking areas outside the building.

Restrooms
Restrooms are located on each floor. Refer to the venue map for additional information.

Social Media
Capture the spirit of IEEE SENSORS 2015 in a Tweet using #IEEESENSORS for the chance to win a set of Sony – EX Series Earbud Headphones. Two prizes available daily.

Conference App
Download the IEEE SENSORS 2015 app to enhance your Conference experience. The app is available for Android, iOS, Windows Phone and Amazon Kindle Fire. Search for “Conference4Me” to download the app then sync the IEEE SENSORS 2015 schedule.

Exhibits
Exhibits are located in the 2F Lobby. Exhibit hours:
Monday, November 2 – 08:30-18:00
Tuesday, November 3 – 08:30-17:30
Wednesday, November 4 – 08:30-16:00

SOCIAL PROGRAM

SUNDAY, NOVEMBER 1

Event: Tutorial Lunch
Time: 13:10-14:10
Location: BEXCO Room 202
**Available to tutorial registrants only*

Event: Welcome Reception
Time: 18:00-20:00
Location: Paradise Hotel Busan

The Paradise Hotel Busan is located in Busan's Haeundae Beach area, where the skies and ocean meet. Attendees will have the opportunity to enjoy the outdoor area (weather permitting) so please dress accordingly. Please note that transportation is not provided. Directions are included in the attendee bag.

MONDAY, NOVEMBER 2

Event: Conference Lunch
Time: 11:30-12:30
Location: BEXCO Grand Ballroom

Event: Young Professionals Reception
Time: 18:00-19:00
Location: BEXCO 211-212

Young Professionals are defined as post-Student members who are within 15 years of receiving their first professional degree. Join us for refreshments, hors d'oeuvres and networking.

TUESDAY, NOVEMBER 3

Event: Conference Lunch & Awards
Time: 11:30-12:30
Location: BEXCO Grand Ballroom

Event: Banquet Dinner
Time: 18:30-22:00
Location: BEXCO Grand Ballroom

IEEE SENSORS 2015 will host a Conference Banquet on Tuesday, November 3. The Banquet will be held at BEXCO and will feature local entertainment and cuisine. Entertainment will be provided by the well-known performance group Namsannorimadang. They will perform three traditional dances including Saja-chum, Poongmul-Pangood, and modern combination of hiphop and Poongmul.

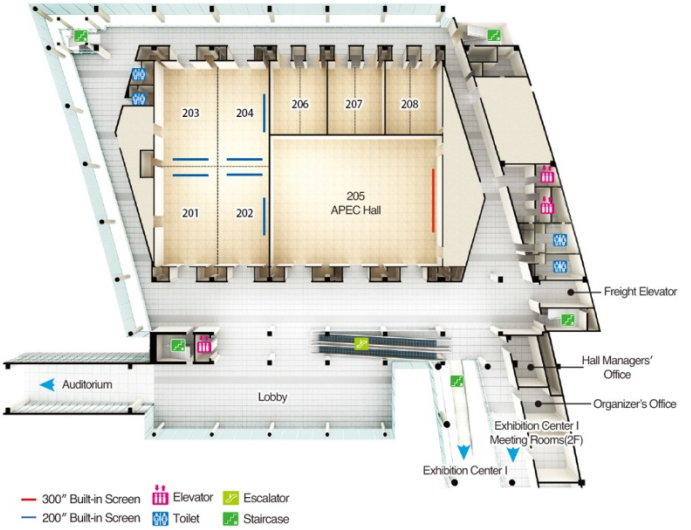
Your paid registration fee includes one banquet ticket. Guest tickets can be purchased for $80.00 USD each at the Registration Desk.

WEDNESDAY, NOVEMBER 4

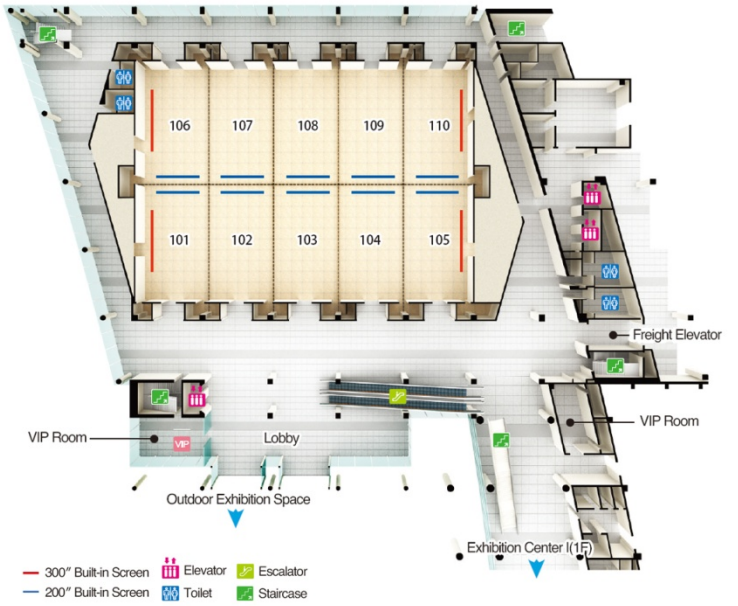
Event: Conference Lunch
Time: 11:30-12:30
Location: BEXCO Grand Ballroom

BEXCO FLOOR PLAN

1st Floor

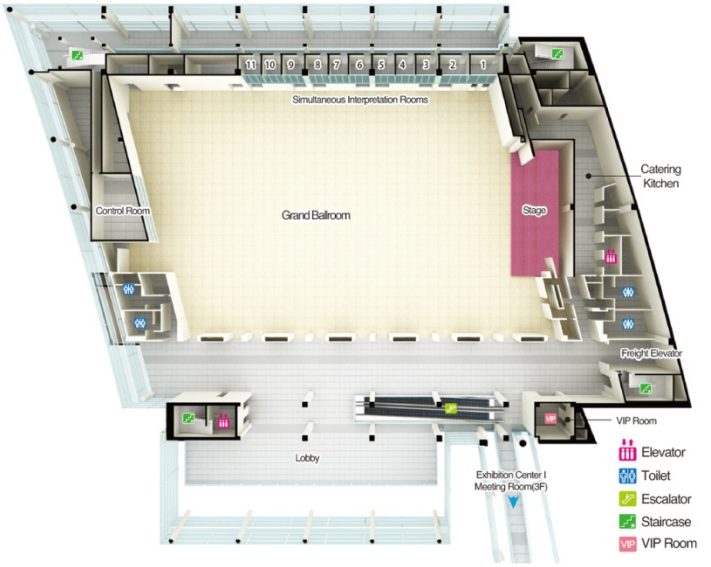


2nd Floor



BEXCO FLOOR PLAN

3rd Floor



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http://www.lg.com/

http://samyoungsnc.com/

EXHIBITORS

http://www.evgroup.com/en/

http://www.ibule.com/en/NDT_Sensor.php

http://iot.ieee.org/

http://www.ieee-sensors.org/

http://logtech.org/

Picodeon

http://www.picodeon.com/

PIEZO TECH
Piezoelectric Technology Co., Ltd.

http://www.piezo-tech.com/

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http://www.visitkorea.or.kr/intro.html

bto 부산관광공사
BUSAN TOURISM ORGANIZATION

http://www.bto.or.kr/eng/main/main.php

TECHNICAL PROGRAM INFORMATION

The technical program consists of three Keynote Sessions, six parallel Lecture/Special Sessions of contributed papers, and three Poster Sessions.

Guide to Understanding Session Numbering
Each session in the technical program is assigned a unique number, which clearly indicates when and where the session is presented. The number of each session is shown before the session title. A typical number is shown below:

Typical Session Number*****: **B2L-A**

The first character (i.e., B) indicates the day of the Conference:

A = Monday; **B** = Tuesday; **C** = Wednesday

The second character (i.e., 2) indicates the session time:

1 = morning; **2** = mid-morning; **3** = afternoon; **4** = late-afternoon

The third character (i.e., L) indicates what type of paper the session is:

L = Lecture Session **P** = Poster Session

The fourth character (i.e., A) indicates which room the session is held in:

A= Room 201
B= Room 202
C= Room 203
D= Room 204
E= Room 206
F= Room 207
G= Room 208

TECHNICAL PROGRAM - POSTER INFORMATION

Three poster sessions will be held in rooms 101-110 after the lunch each day on Monday, Tuesday, and Wednesday. Posters will be on display for the duration of the conference and authors will be available for questions during their appointed time. All poster papers are listed in this program on the day that they are presented.

Each poster in the technical program is assigned a unique number, which clearly indicates the paper track and where the poster is presented. The number of each poster is shown on the left-hand side, before the title. A typical number is shown below:

1-35
Paper Title

The first number indicates the paper track:

1	Phenomena, Modeling and Evaluation
2	Chemical and Gas Sensors
3	Biosensors
4	Optical Sensors
5	Mechanical, Magnetic, and Physical Sensors
6	Sensor/Actuator Systems
7	Sensor Networks
8	Applications
9	Other Sensor Topics - Materials, Processes, Circuits, Signals & Interfaces, etc.
13	Late News
15	Open Poster

The second number indicates the board location. Please refer to the poster board layout handout in the attendee bag.

SENSORS JOURNAL

The *IEEE Sensors Journal* is a peer-reviewed scientific journal covering research on sensors and sensing phenomena. It is published monthly on-line and bi-monthly in print by the IEEE Sensors Council. According to the Journal Citation Reports, the *IEEE Sensors Journal* has a 2014 impact factor of 1.852. The average time for making an editorial decision on regular papers is just below 2 months.

The topics of interest of the *IEEE Sensors Journal* include:
"all types of sensing: mechanical, thermal, optical, magnetic, radiation, microwave, chemical, biological, mass, etc., both on the macro and micro levels. Also of interest are sensor packaging, interconnection, modeling, wireless sensing, CAD, stability (e.g., noise), characterization, sensor signal processing, sensor arrays (e.g., e-nose), sensor systems, intelligent sensors, sensor actuators, and applications."

SUBMISSION: Submissions, original papers only, are to be made electronically through IEEE Manuscript Central, over its Webpage. This site contains instructions on how authors proceed with a submission. Please do not send submissions or revisions directly to the Editor-in-Chief or Associate Editors: mc.manuscriptcentral.com/sensors

Authors are required to prepare manuscripts employing the double column style template developed by IEEE. Information for authors, on article preparation and submission, templates, etc. can be found at: www.ieee-sensors.org/information-for-authors The *IEEE Sensors Journal* does not republish papers that have appeared in conference proceedings unless the paper has been expanded; i.e., unless the paper contains substantial new material. (See the special instructions for expanding conference papers on our website). The IEEE Sensors Journal also publishes "letters".

www.ieee-sensors.org/journals

**The Professional Development Track will include Journal author and reviewer training sessions*

PRESENTATION DOWNLOADS

Because of the parallel sessions, IEEE SENSORS 2015 participants will probably miss some important presentations they would have liked to see. Therefore, as an extra benefit for conference participants, about 200* presentations are being recorded (with the presenters' consent). The recordings consist of the authors' slides and voice (no video).

The recordings are available for downloading, free to conference attendees only, from the day after the presentation until noon, Eastern USA time, Monday, 9 November. Last year, more than 14,000 presentations were downloaded by attendees; 529 of the attendees downloaded at least one presentation.

The presentations may be downloaded until Monday, November 9 at http://ieee-sensors2015online.org/

After 9 November, the plan is to make the recorded presentations available in IEEE Xplore together with the customary proceedings articles.

** We regret that poster papers and presentations by authors who opted out of being recorded will not be available for downloading. Authors who opted out and now wish to be recorded - please sign a new copyright form at least a half day before your talk, at the registration desk, and we will try to add your paper to the list of papers to be recorded.*

NEW FOR 2015: DEMOS

This year's program will include Live Demonstrations. Demos give attendees the opportunity to have an interactive experience with new technological devices. Demonstrations will reveal the essence of the research and provide further understanding for attendees.

Demos will be on Monday, November 1 during the poster session. The letter preceding the demo indicates the demo position.

13:00 - 14:30
A3P-R: LIVE DEMONSTRATIONS
SPECIAL POSTERS
SESSION CHAIR: Sandro Carrara (EPFL)

A: MODULAR MULTI-RADIO WIRELESS SENSOR PLATFORM WITH PLUG&PLAY MODULES CONNECTION
Konstantin Mikhaylov, Juha Petäjäjärvi, Marko Mäkeläinen, Anton Paatelma, Tuomo Hänninen
University of Oulu, Finland

B: PROSTHETIC HANDS CONTROLLED WITH A HIGHLY USABLE SEMG SENSOR
Shintaro Sakoda, Yoshiko Yabuki, Yinlai Jiang
University of Electro-Communications, Japan

C: UPPER LIMB PROSTHETIC CONTROL USING TOE GESTURE SENSORS AND VARIOUS TOUCH INTERFACES
Ravinder Dahiya
University of Glasgow, United Kingdom

D: LIVE DEMONSTRATION OF A MUTUAL-CAPACITIVE TOUCH SENSOR ROIC USING A PLL TO REDUCE LCD NOISE BY SYNCHRONIZING ROIC TX CLOCK TO LCD CLOCK
Dong-Hee Yeo, Seon-Ho Kim, Hyeon-Kyu Noh, Jae-Yoon Sim, Byungsup Kim, Hong-June Park
Pohang University of Science and Technology, South Korea

E: MICROSYSTEM INTEGRATION OF A PALLADIUM-BASED MEMS HYDROGEN GAS SENSOR
(related conference paper ID 1704)
Thomas Walewyns{2}, Carl Emmerechts{1}, Pierre Gérard{2}, Nicolas André{2}, Laurent A. Francis{2}
{1}Sirris, Belgium; {2}Université Catholique de Louvain, Belgium

F: RIPPLE SORT' ALGORITHM, CIRCUIT IMPLEMENTATION AND VERIFICATION USING VHDL SYNTHESISABLE TESTBENCH VERIFICATION TECHNIQUE
Ching Man{1}, Elfed Lewis{2}, Brian Moss{2}
{1}Analog Devices, Inc. / University Of Limerick, Ireland; {2}University of Limerick, Ireland

G: LDV_UPI System for Structural Health Monitoring of Composite Material
Thanh Chung Truong[{2}], Jae-Yoon Park[{2}], Jae Kyeong Jang[{1}], Jung Ryul Lee[{2}]
[{1}]Chonbuk National University, Korea; [{2}]Korea Advanced Institute of Science and Technology, Korea

H: CMOS BEOL-EMBEDDED 3-AXIS ACCELEROMETER
Piotr Michalik[{2}], Josep Maria Sánchez-Chiva[{2}], Daniel Fernández[{1}], Jordi Madrenas[{2}]
[{1}]Nanusens, Spain; [{2}]Universitat Politecnica de Catalunya, Spain

I: A NEW ADAPTIVE FRONT-END READOUT CIRCUIT FOR HIGH-RESOLUTION MAGNETIC SCALES
Ping-Chieh Chien, Yung-Hua Kao, Hong-Yang Chen, Jing-Hao Huang, Paul C.-P. Chao, Chin-Long Wey
National Chiao Tung University, Taiwan

NEW FOR 2015:
PROFESSIONAL DEVELOPMENT PROGRAM

The Professional Development Program will be held on Tuesday, November 3.

14:00-15:30
Professional Development Program I
Room 208

14:00 - SENSORS COUNCIL AWARDS PROGRAM
Mike McShane (Council Awards Chair)

14:15 - IEEE FELLOWS PROGRAM
Gianluca Lazzi (Council Fellows Committee Chair) & Troy Nagle (Council President)

14:30 - YOUNG PROFESSIONALS PROGRAM
Sinead O'Keeffe (Council Young Professionals Chair)

14:45 - ORGANIZING COUNCIL CHAPTERS
Ramesh Ramadoss (San Francisco Bay Area Council Chapter Chair) & Hulya Kirkici (Council Distinguished Lecturer Program Chair)

15:00 - MENTORING ROUNDTABLE
Sharon Peng (Harman International, USA) & Chris Schober (IEEE SENSORS 2015 General Co-Chair) & Jill Gostin (Council Secretary – Treasurer)

16:00-17:30
Professional Development Program II
Room 208

16:00 - ORGANIZING GREAT CONFERENCES
Yu-Cheng Lin (Council VP Conferences)

16:30 - SENSORS COUNCIL STANDARDS INITIATIVE
Sri Chandrasekaran (IEEE-SA, India)

16:45 - SOLITICING & TRAINING JOURNAL REVIEWERS
Krikor Ozanyan (Sensors Journal Editor-in-Chief)

17:00 - AUTHOR TRAINING FOR JOURNALS AND CONFERENCE PROCEEDINGS
John Vig (Council VP Publications)

NEW FOR 2015: INDUSTRY TRACK

New this year: Industry Track will be held on Wednesday, November 4.

10:00-11:30
INDUSTRY TRACK I
ROOM 208

10:00
LOWER POWER, BATTERY OPERATED WIRELESS SENSING OPTIONS
Jim Philipp (Murata, USA)

10:45
WEARABLE LOW-POWER SENSORS
Veena Misra (NCSU/NSF – ASSIST, USA)

11:30-12:30
LUNCH/PANEL ON WEARABLE TECHNOLOGIES
GRAND BALLROOM

Moderator: Veena Misra (NCSU/NSF – ASSIST, USA)
Gerry Hayes (Wireless Center of NC, USA)
Brian Kim (RaonTech, Korea)
Younghyun Kim (Samsung Electronics, Korea)
Brian Carrigan (Smashing Boxes, USA)
Jan Svoboda (Firefly Solutions, USA)

14:00-15:30
INDUSTRY TRACK II
ROOM 208

14:00-14:30
SENSORS ACTIVITIES AT MEMS INDUSTRY GROUP (MIG) & IEEE 2700 (SENSOR PERFORMANCE)
Michael Gaitan (MIG/NIST, USA)

14:30-15:00
SMART SENSOR AND NETWORK INTERFACES TO IOT IN SUPPORT OF BIG DATA
John L. Schmalzel (Rowan University, USA)

15:00-15:30
STANDARDS: IEEE P2413 – ARCHITECTURAL FRAMEWORK FOR INTERNET OF THINGS
Sri Chandrasekaran (IEEE-SA, India)

16:00-17:30
STANDARDS PANEL
ROOM 208

Moderator: Gerry Hayes (Wireless Center of NC, USA)
Jim Philipp (Murata, USA)
Mike Gaitan (NIST/MIG, USA)
Younghyun Kim (Samsung, Korea)

SESSION GRID: SUNDAY, NOVEMBER 1

	Room 201	Room 202	Room 203	Room 204	Room 206	Room 207	Room 208
0800-1730	REGISTRATION						
0800-0830	INSTRUCTORS' BREAKFAST *Room 207*						
0830-0930					TUTORIAL 1: Next generation telecom fibers - new opportunities for optical fiber sensing, Marco Petrovich		
0940-1040					TUTORIAL 2: Thermal ablation of tumors: an emerging application for sensors, Daniele Tosi		
1040-1100	MORNING BREAK						
1100-1200					TUTORIAL 3: Optical fiber sensing technologies based on sensitive thin films and coatings, Minghong Yang		
1210-1310					TUTORIAL 4: Hyperspectral Imaging: fundamentals and case studies, Silvia Serranti & Giuseppe Bonifazi		
1310-1410	LUNCH *Room 202*						
1410-1510					TUTORIAL 5: Sensing in extreme environments, Alton Horsfall		
1520-1620					TUTORIAL 6: Screen printed sensors, John K. Atkinson		
1630-1730					TUTORIAL 7: Air-microfluidics: an introduction to theory and applications, Igor Paprotny		
Evening	WELCOME RECEPTION *Paradise Hotel 1800-2000*						

SESSION GRID: MONDAY, NOVEMBER 2

	Room 201	Room 202	Room 203	Room 204	Room 206	Room 207	Room 208
0800-1800	REGISTRATION						
0800-0830	SPEAKERS' BREAKFAST *Room 211-212*						
0830-0900	Opening Session *Grand Ballroom*						
0900-1000	A1L-A:KEYNOTE: Uwe Hanebeck *"Hot Topics in Multisensor Data Fusion"* *Grand Ballroom*						
1000-1030	MORNING BREAK						
1030-1200	A2L-A: Chemical and fuel-cell Applications *Track: Applications*	A2L-B: SPECIAL SESSION: Structural Sensing *Track: SPECIAL SESSIONS*	A2L-C: Optical Sensing Applications I *Track: Applications*	A2L-D: Optical Chemical Sensor Systems *Track: Chemical and Gas Sensors*	A2L-E: Immunosensors *Track: Biosensors*	A2L-F: Physical Sensor System *Track: Sensor/Actuator Systems*	A2L-G: Student Award Competition Presentations
1200-1300	LUNCH *Grand Ballroom*						
1300-1430	Poster Session: A3P-G - A3P-Q *Rooms 101-110*						
1430-1600	A4L-A: Printed and Flexible Chemical Sensors *Track: Chemical and Gas Sensors*	A4L-B: Accelerometers *Track: Mechanical, Magnetic, and Physical Sensors*	A4L-C: Motion and Location Tracking *Track: Applications*	A4L-D: Optical Sensor Systems *Track: Optical Sensors*	A4L-E: Physical Biosensors *Track: Biosensors*	A4L-F: Inertial Sensor System *Track: Sensor/Actuator Systems*	
1600-1630	AFTERNOON BREAK						
1630-1800	A5L-A: Metal Oxide Gas Sensors *Track: Chemical and Gas Sensors*	A5L-B: Gyroscope & Resonators *Track: Mechanical, Magnetic, and Physical Sensors*	A5L-C: Fluidic Systems *Track: Applications*	A5L-D: Fiber Optic Sensors *Track: Optical Sensors*	A5L-E: Cell-based Biosensors *Track: Biosensors*	A5L-F: Multi-sensor and Sensor-network Systems *Track: Applications*	
Evening	YOUNG PROFESSIONALS RECEPTION *1800-1900*						

SESSION GRID: TUESDAY, NOVEMBER 3

	Room 201	Room 202	Room 203	Room 204	Room 206	Room 207	Room 208
0800-1800	REGISTRATION						
0800-0830	SPEAKERS' BREAKFAST *Room 211-212*						
0830-0930	B1L-A: KEYNOTE: Andrew Cleland *"Mechanical Systems in the Quantum Limit"* *Grand Ballroom*						
0930-1000	MORNING BREAK						
1000-1130	B2L-A: Advanced Materials or Architectures for Chemical Sensing *Track: Chemical and Gas Sensors*	B2L-B: Ultrasonic, Acoustic, Magnetic Sensors *Track: Mechanical, Magnetic, and Physical Sensors*	B2L-C: Force and Pressure Based Sensing Applications *Track: Applications*	B2L-D: Optical Sensing *Track: Optical Sensors*	B2L-E: Electrochemical Biosensors *Track: Biosensors*	B2L-F: Sensors Readout/Interface/Circuits I *Track: Other Sensor Topics - Materials, Processes, Circuits, Signals & Interfaces, etc.*	
1130-1230	LUNCH & AWARDS *Grand Ballroom*						
1230-1400	Poster Session: B3P-G - B3P-Q *Rooms 101-110*						
1400-1530	B4L-A: Electrochemical Sensors *Track: Chemical and Gas Sensors*	B4L-B: Pressure & Strain Sensors *Track: Mechanical, Magnetic, and Physical Sensors*	B4L-C: Acoustic Structures *Track: Phenomena, Modeling and Evaluation*	B4L-D: Optical Biosensors *Track: Biosensors*	B4L-E: Chemical & Bio Sensor System *Track: Sensor/Actuator Systems*	B4L-F: Sensors Readout/Interface/Circuits II *Track: Other Sensor Topics - Materials, Processes, Circuits, Signals & Interfaces, etc.*	B4L-G: Professional Development Program I *Track: Professional Development*
1530-1600	AFTERNOON BREAK						
1600-1730	B5L-A: Acoustic Wave Chemicals Sensors *Track: Chemical and Gas Sensors*	B5L-B: Physical Sensors I *Track: Mechanical, Magnetic, and Physical Sensors*	B5L-C: Methods/Characterization/Systems *Track: Other Sensor Topics - Materials, Processes, Circuits, Signals & Interfaces, etc.*	B5L-D: Imaging Sensors *Track: Optical Sensors*	B5L-E: Applications in Agriculture and the Environment *Track: Applications*	B5L-F: Electronics *Track: Applications*	B5L-G: Professional Development Program II *Track: Professional Development*
Evening	CONFERENCE BANQUET *BEXCO Grand Ballroom* *Featuring Korean Entertainment* *1830-2200*						

SESSION GRID: WEDNESDAY, NOVEMBER 4

	Room 201	Room 202	Room 203	Room 204	Room 206	Room 207	Room 208
0800-1730	REGISTRATION						
0800-0830	SPEAKERS' BREAKFAST *Room 211-212*						
0830-0930	C1L-A: KEYNOTE: Suntae Jung *"Sensing Technology for Upcoming Healthcare System"* *Grand Ballroom*						
0930-1000	MORNING BREAK						
1000-1130	C2L-A: SPECIAL SESSION: 3D Printed Sensors & Actuators *Track: SPECIAL SESSIONS*	C2L-B: Environmental Sensors *Track: Mechanical, Magnetic, and Physical Sensors*	C2L-C: Modeling and Simulation of Novel Devices *Track: Phenomena, Modeling and Evaluation*	C2L-D: Photodiodes & Photodetectors Based Sensors I *Track: Optical Sensors*	C2L-E: Application and Energy Management *Track: Sensor Networks*	C2L-F: Devices/Systems I *Track: Other Sensor Topics - Materials, Processes, Circuits, Signals & Interfaces, etc.*	C2L-G: Industry Track I *Track: Industry*
1130-1230	LUNCH *Grand Ballroom* *Panel discussion on wearable technologies (engagement with local experts)*						
1230-1400	Poster Session: C3P-G - C3P-P *Rooms 101-110*						
1400-1530	C4L-A: Fabrication/Technology I *Track: Other Sensor Topics - Materials, Processes, Circuits, Signals & Interfaces, etc.*	C4L-B: Tactile Sensors & Smart Skin *Track: Mechanical, Magnetic, and Physical Sensors*	C4L-C: Theory and New Approach *Track: Sensor Networks*	C4L-D: Photodiodes & Photodetectors Based Sensors II *Track: Optical Sensors*	C4L-E: Energy & Power Systems *Track: Other Sensor Topics - Materials, Processes, Circuits, Signals & Interfaces, etc.*	C4L-F: Devices/Systems II *Track: Other Sensor Topics - Materials, Processes, Circuits, Signals & Interfaces, etc.*	C4L-G: Industry Track II *Track: Industry*
1530-1600	AFTERNOON BREAK						
1600-1730	C5L-A: Biological & Chemical Sensors *Track: Chemical and Gas Sensors*	C5L-B: Physical Sensors II *Track: Mechanical, Magnetic, and Physical Sensors*		C5L-D: Human Activity Monitoring *Track: Applications*		C5L-F: Sensor Packaging *Track: Other Sensor Topics - Materials, Processes, Circuits, Signals & Interfaces, etc.*	C5L-G: Standards Panel *Track: Industry*

Monday, November 2
Uwe Hanebeck, Karlsruhe Inst. of Technology
"Hot Topics in Multisensor Data Fusion"

Several hot topics of high practical relevance in the context of recursive estimation of states and parameters based on data from multiple sensors will be discussed. First, new types of nonlinear Kalman filters based on optimal deterministic sampling approximations of continuous density functions are shown. These filters provide an adjustable tradeoff between estimation quality and computational complexity. They also allow the optimal estimation of periodic quantities, such as angles or orientations. Second, the direct fusion of two estimates characterized by data points only is discussed. This is a practically relevant problem, as often no further knowledge about the estimates is available. It arises, e.g., when fusing the output of two particle filters. Third, when tracking multiple objects with high-resolution sensors, the problem of associating sensor data with objects and object parts arises. In this talk, I will argue for association-free methods that never explicitly associate sensor data with objects and provide high-quality estimates with a low computational complexity.

All methods are based on a new distance measure between probability density functions. This distance can handle a comparison between arbitrary continuous and discrete densities, in particular between empirical distributions. It can efficiently be computed and is continuously differentiable, which makes it useful for optimization purposes. Some application examples such as object tracking for belt sorting of bulk material, person tracking in extended range telepresence systems, and surface reconstruction in beating heart surgery will be shown.

Uwe D. Hanebeck is a chaired professor of Computer Science at the Karlsruhe Institute of Technology (KIT) in Germany and director of the Intelligent Sensor-Actuator-Systems Laboratory (ISAS). Since 2005, he is the chairman of the Research Training Group RTG 1194 "Self-Organizing Sensor-Actuator-Networks" financed by the German Research Foundation. Prof. Hanebeck obtained his Ph.D. degree in 1997 and his habilitation degree in 2003, both in Electrical Engineering from the Technical University in Munich, Germany. His research interests are in the areas of information fusion, nonlinear state estimation, stochastic modeling, system identification, and control with a strong emphasis on theory-driven approaches based on stochastic system theory and uncertainty models. Research results are applied to various application topics like localization, human-robot-interaction, assistive systems, sensor-actuator-networks, medical engineering, distributed measuring systems, and extended range telepresence.

Professor Hanebeck has held important leadership positions in numerous IEEE conferences. He is a Member of the Board of Directors of the International Society of Information Fusion (ISIF), Editor-in-chief of its *Journal of Advances in Information Fusion* (JAIF), and associate editor for the letter category of the *IEEE Transactions on Aerospace and Electronic Systems* (TAES). He is author and coauthor of more than 350 publications in various high-ranking journals and conferences.

Tuesday, November 3
Andrew Cleland, University of Chicago
"*Mechanical Systems in the Quantum Limit*"

There has been much progress recently in developing mechanical devices that can be operated in the quantum limit. This effort has combined geometric designs with materials research, as well most significantly the development of methods to cool mechanical systems to the quantum ground state and then perform measurements that are not too invasive. I will describe our approach, in which we succeeded in both cooling a mechanical mode to the ground state, using conventional refrigeration techniques, and then injecting and measuring single phonons, the quanta of acoustic vibrations. This was achieved by coupling a microwave frequency superconducting quantum bit to a microwave frequency mechanical resonator.

More recently, we have begun developing analogous technology to attempt to build elements for a quantum repeater, a device that will be central for applications to quantum communication. This device relies on a parametric conversion of signals between microwave and optical frequencies, is coupled to a fiber optic for transmission of quantum (or classical) information, and ultimately would be coupled to a microwave frequency quantum bit, either based on superconducting or semiconducting quantum technology. I will include a brief description of this approach and a description of its status.

Andrew Cleland is the John A. Maclean Sr. Professor for Quantum Engineering Innovation, and is a member of the Institute of Molecular Engineering at the University of Chicago. He is also the Director of the Pritzker Nanofabrication Facility, on the University of Chicago campus. His research focus is on the developing of superconducting quantum circuit; nanoscale devices integrating electronic, mechanical and optical fields, while operating at the quantum limit; and microfluidic technology for practical applications, with a focus on high-throughput nanoparticle analysis. To date, his accomplishments have included the first demonstration of a mechanical system cooled to its quantum ground state; the demonstration of a high fidelity, scalable superconducting quantum bit that should allow construction of a simple, error-correcting quantum circuit; and the development of an electrooptomechanical system operating in the microwave and optical frequency domains.

Cleland is the author or co-author of over 120 peer-reviewed publications. He is a Fellow of the American Association for the Advancement of Science and the American Physical Society. His work was recognized as the Science “Breakthrough of the Year” for 2010, and selected as one of the “Top Ten Discoveries in Physics” by the Institute of Physics (United Kingdom) in both 2010 and 2011.

He earned a BS in engineering physics and a PhD in physics from the University of California, Berkeley. Prior to joining the University of Chicago, Cleland was a professor of physics at the University of California, Santa Barbara, and served as the Associate Director of its California Nanosystems Institute.

KEYNOTE SPEAKERS

Wednesday, November 4
Suntae Jung, Samsung Electronics
"Sensing Technology for Upcoming Healthcare System"

An aging population and a continually increasing number of chronic disease patients have caused a focal shift in healthcare from therapy and treatment to prevention and management. The upcoming Healthcare System brings more connectivity between consumers and hospitals by enabling the medical staff to check the health status of a patient outside of the hospital without disturbing their daily life. In addition, doctors and nurses can communicate with their patients remotely and more frequently for preventative health measures. It may also reduce time to recover from disease by intelligent analysis of collected data. Sensors are widely adopted and researched in the field of healthcare and environmental monitoring with applications for wearable devices, smart phones, and home monitoring systems. This includes analysis of vital signs, POC (point of care), and images, ultimately reaching towards innovative non-intentional, non-invasive, and complex measurement technologies. We are expecting sensors to take an essential role in the upcoming healthcare era, and intensive effort should be focused in the research.

Suntae Jung completed his Ph.D. in Materials Science at Seoul National University at 1995, following M.S. and B.S. in the same university at 1988 and 1990, respectively. Between 1995 and 1996 he was a researcher at the Beckman institute at University of Illinois, Urbana-Champaign. He joined Samsung Electronics 1996, and was involved in developing optical communication devices such as AWG (Arrayed Wave Guide) multiplexers and de-multiplexers for WDM (Wavelength Division Multiplexing) until 2004. Starting in 2005, he led the development of Waveguide Keypad, Flexible Display Keypad, Pen Touch for innovative smartphone input technologies as well as Mobile Health Sensors, including mobile ECG, stress Index, photoplethysmography, and accelerometer applications. Such innovations earned him honors from National IR52 (Industrial Research) in 2009 and 2012. Currently, Dr. Jun has interest in Mobile Healthcare and IoT Sensing. He leads Samsung's activities in the development of healthcare technologies in Prevention, Medical Treatment and Prognosis Management based on IT and IoT sensing technologies.

SUNDAY, NOVEMBER 1 - TUTORIALS

08:00 – 17:30
REGISTRATION
1F LOBBY

**All tutorials are located in room 206*

08:30 - 09:30
NEXT GENERATION TELECOM FIBERS - NEW OPPORTUNITIES FOR OPTICAL FIBER SENSING
Marco Petrovich, *University of Southampton, UK*

09:40 - 10:40
THERMAL ABLATION OF TUMORS: AN EMERGING APPLICATION FOR SENSORS
Daniele Tosi, *Nazarbayev University, Kazakhstan*

10:40 - 11:00
MORNING BREAK
OUTSIDE 200'S

11:00 - 12:00
OPTICAL FIBER SENSING TECHNOLOGIES BASED ON SENSITIVE THIN FILMS AND COATINGS
Minghong Yang, *Wuhan University of Technology, P.R. China*

12:10 - 13:10
HYPERSPECTRAL IMAGING: FUNDAMENTALS AND CASE STUDIES
Silvia Serranti & Giuseppe Bonifazi, *University of Rome "La Sapienza", Italy*

13:10 - 14:10
LUNCH
ROOM 202

14:10 - 15:10
SENSING IN EXTREME ENVIRONMENTS
Alton Horsfall, *Newcastle University, UK*

15:20 - 16:20
SCREEN PRINTED SENSORS
John K. Atkinson, *University of Southampton, UK*

16:30 - 17:30
AIR-MICROFLUIDICS: AN INTRODUCTION TO THEORY AND APPLICATIONS
Igor Paprotny, *University of Illinois, USA*

18:00 – 20:00
WELCOME RECEPTION
PARADISE HOTEL

MONDAY, NOVEMBER 2

08:00 - 08:30
MONDAY LECTURE AUTHOR BREAKFAST
ROOM 211-212

08:30 -09:00
OPENING SESSION
GRAND BALLROOM

09:00 - 10:00
KEYNOTE: Hot Topics in Multisensor Data Fusion
Uwe Hanebeck
Karlsruher Institut für Technologie, Germany
GRAND BALLROOM

10:00 - 10:30
MONDAY MORNING BREAK
2F LOBBY

10:30 - 12:00
A2L-A: CHEMICAL AND FUEL-CELL APPLICATIONS
ROOM 201
SESSION CHAIRS : Hongrui Jiang (University of Wisconsin)
Venkat Bhethanabotla (University of South Florida)

10:30
AN ENZYMATIC GLUCOSE BIOFUEL CELL BASED ON AU NANO-ELECTRODE ARRAY
Tanmay A. Kulkarni, Deepa Gupta, Gymama Slaughter
University of Maryland Baltimore County, USA

10:45
CELL INTEGRATED THIN-FILM MULTI-JUNCTION THERMOCOUPLE ARRAY FOR IN-SITU TEMPERATURE MONITORING OF SOLID OXIDE FUEL CELLS
Manoj Ranaweera, Indae Choi, Jung-Sik Kim
Loughborough University, United Kingdom

11:00

AN IMPLEMENTATION OF AN ELECTRONIC TONGUE SYSTEM BASED ON A MULTI-SENSOR POTENTIOMETRIC READOUT CIRCUIT WITH EMBEDDED CALIBRATION AND TEMPERATURE COMPENSATION

Wen-Yaw Chung[1], Angelito Silverio[1], Vincent F.S. Tsai[4], Cheanyeh Cheng[1], Shu-Yu Chang[1], Ming-Ying Zhou[1], Chi-Ying Kao[1], Si-Yuan Chen[2], Dorota Pijanowska[3]
[1]Chung Yuan Christian University, Taiwan; [2]Jimei University, China; [3]Polish Academy of Sciences, Poland; [4]Ten Chen Medical Group, Taiwan

11:15

PORTABLE WIRELESS DEVICE FOR HEMOGLOBIN LEVEL MONITORING

Dae-Sik Lee, W.-J. Kim, M.-Y. Jung, B.-G. Jeon
Electronics and Telecommunications Research Institute, Korea

11:30

ODOR ASSESSMENT OF AUTOMOBILE INTERIOR COMPONENTS USING ION MOBILITY SPECTROMETRY

Juan Li[2], Ricardo Gutierrez-Osuna[3], Ryan D. Hodges[2], Gail Luckey[1], Joel Crowell[1], Susan S. Schiffman[2], H. Troy Nagle[2]
[1]Hyundai Motor Group, USA; [2]North Carolina State University, USA; [3]Texas A&M University, USA

11:45

A THRESHOLD VOLTAGE VARIATION CALIBRATION ALGORITHM FOR AN ISFET-BASED LOW-COST PH SENSOR SYSTEM

Ikho Lee, Donghoon Kim, Jeong-Soo Lee, Byungsub Kim, Chanoh Park
Pohang University of Science and Technology, Korea

10:30 - 12:00
A2L-B: SPECIAL SESSION: STRUCTURAL SENSING
ROOM 202
SESSION CHAIR : Jung-Ryul Lee (KAIST)

10:30

INVITED: KOREA AIR FORCE STANDARD NDE COUPON TEST OF FULL-FIELD PULSE-ECHO LASER ULTRASONIC PROPAGATION IMAGING SYSTEM

Seung-Chan Hong[2], Jung-Ryul Lee[2], Jongwoon Park[1]
[1]Aero Technology Research Institute, Logistics Command, Republic of Korea Air Force, Korea; [2]Korea Advanced Institute of Science and Technology, Korea

11:00
A HAPTIC-INSPIRED APPROACH OF ULTRASONIC NONDESTRUCTIVE DAMAGE CLASSIFICATION
Zhu Mao[{2}], Michael Todd[{2}], David Mascareñas[{1}]
[{1}]Los Alamos National Laboratory, USA; [{2}]University of California, San Diego , USA

11:15
REMOTE IMAGING OF LOCAL RESONANCE FOR INSPECTION OF HONEYCOMB SANDWICH COMPOSITE PANELS
Suji Han[{1}], Jung-Ryul Lee[{2}], Eric Flynn[{3}]
[{1}]Chonbuk National University, Korea; [{2}]Korea Advanced Institute of Science and Technology, Korea; [{3}]Los Alamos National Laboratory, USA

11:30
INVESTIGATION ON OPTIMAL POLING CONDITION OF PNN-PZT/EPOXY PAINT SENSOR AND ITS SENSITIVITY IMPROVEMENT
Dae-Hyun Han, Myeongcheol Kang, Lae-Hyong Kang
Chonbuk National University, Korea

11:45
A VIBRO-HAPTIC INTERFACE DEVELOPMENT FOR IMPACT DETECTION ON UAV WINGS
Hwee Kwon Jung, Myung Jun Lee, Chang Won Lee, Gyuhae Park
Chonnam National University, Korea

10:30 - 12:00
A2L-C: OPTICAL SENSING APPLICATIONS I
ROOM 203
SESSION CHAIRS: Huikai Xie (University of Florida)
David Horsley (University of California, Davis)

10:30
INVITED: PLASMONIC PIEZOELECTRIC NEMS RESONANT INFRARED DETECTORS
Matteo Rinaldi, Yu Hui, Zhenyun Qian, Vageeswar Rajaram, Ryan Sungho Kang
Northeastern University, USA

11:00
AN OPTICAL HEAD-POSE TRACKING SENSOR FOR POINTING DEVICES USING IR-LED BASED MARKERS AND A LOW-COST CAMERA
Edwin Walsh, Walter Daems, Jan Steckel
Universiteit Antwerpen, Belgium

11:15
MEASUREMENT OF THE TEMPERATURE SENSITIVITY OF PHASE MODAL BIREFRINGENCE OF POLARIZATION MAINTAINING OPTICAL FIBERS USING A SAGNAC INTERFEROMETER BASED TEMPERATURE SENSOR
Cezary Kaczmarek
Lublin University of Technology, Poland

11:30
TEMPORAL PATTERN RECOGNITION FOR GAIT ANALYSIS APPLICATIONS USING AN "INTELLIGENT CARPET" SYSTEM
Omar Costilla-Reyes, Patricia J. Scully, Krikor B. Ozanyan
University of Manchester, United Kingdom

11:45
SMART FUNCTIONS FOR CARBON NANOTUBE BOLOMETER
Matthieu Denoual[{1}], Mathieu Pouliquen[{1}], Gilles Allègre[{1}], Nathan Tomlin[{2}], John Lehman[{2}]
[{1}]École nationale supérieure d'ingénieurs de Caen & Centre de Recherche, France; [{2}]National Institute of Standards and Technology, USA

10:30 - 11:45
A2L-D: OPTICAL CHEMICAL SENSOR SYSTEMS
ROOM 204
SESSION CHAIRS: Michael McShane (Texas A&M University)
Yu-Cheng Lin (National Cheng Kung University)

10:30
ODOR SOURCE SHAPE VISUALIZATION BY MULTISPECTRAL FLUORESCENCE SENSING
Hiro-Taka Yoshioka, Chuanjun Liu, Kenshi Hayashi
Kyushu University, Japan

10:45
HIGH PHOTOCURRENT AND HIGH FREQUENCY RESPONSE OF LIGHT-ADDRESSABLE POTENTIOMETRIC SENSOR WITH THIN SI SUBSTRATE AND SURFACE ROUGHNESS
Wei-Yin Zeng, Cong-Cheng Chen, Chia-Ming Yang, Chao-Sung Lai
Chang Gung University, Taiwan

11:00
REAL-TIME 2D PH IMAGES BY FAST SCANNING LIGHT-ADDRESSABLE POTENTIOMETRIC SENSOR SYSTEM CONTROLLED BY LABVIEW PROGRAM
Hui-Ling Liu[{1}], Yi-Ming Chen[{1}], Chia-Ming Yang[{1}], Chao-Sung Lai[{1}], Chang Ren[{2}], Chen-Gang Lyu[{2}]
[{1}]Chang Gung University, Taiwan; [{2}]Tianjin University, China

11:15

DETERMINATION OF SAFRANAL CONCENTRATION IN SAFFRON SAMPLES BY MEANS OF VE-TONGUE, SPME-GC-MS, UV-VIS SPECTROPHOTOMETRY AND MULTIVARIATE ANALYSIS

Khalid Tahri[{2}], Madiha Bougrini[{2}], Tarik Saidi[{2}], Carlo Tiebe[{1}], Nadia El Alami-El Hassani[{2}], Nezha El Bari[{2}], Thomas Hübert[{1}], Benachir Bouchikhi[{3}]

[{1}]Federal Institute for Materials Research and Testing, Germany; [{2}]Moulay Ismaïl University, Morocco; [{3}]Moulay Ismaïl University / Sensor Electronic & Instrumentation Group, Morocco

11:30

GAS VISUALIZATION BASED ON LOCALIZED SURFACE PLASMON RESONANCE OF GOLD NANOPARTICLE FILMS

Tomoki Koga, Hiro-Taka Yoshioka, Chuanjun Liu, Kenshi Hayashi Kyushu University, Japan

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10:30 - 12:00

A2L-E: ENVIRONMENTAL SENSORS AND NETWORKS

ROOM 206

SESSION CHAIRS: Deepak Uttamchandani (University of Strathclyde)

Zhihong Li (Peking University)

10:30

INVITED: THE INTELLIGENT CONTAINER - WHAT CAN MEMS DO FOR LOGISTICS OF FOOD?

Walter Lang, Reiner Jedermann
Universität Bremen, Germany

11:00

APPLICATION OF WATER QUALITY INDEX FOR POLLUTION DETECTION AT LUTON HOO LAKE

Tochukwu Anyachebelu, Marc Conrad, David Rawson, Tahmina Ajmal University of Bedfordshire, United Kingdom

11:15

THE INTERNET OF THINGS BASED MEDICAL EMERGENCY MANAGEMENT USING HADOOP ECOSYSTEM

Muhammad Mazhar Rathore, Awais Ahmad, Anand Paul
Kyungpook National University, Korea

11:30

PERFORMANCE IMPROVEMENT OF OPTICAL FIBRE OXYGEN SENSOR DETECTION SCHEME INCORPORATING NARROW BANDPASS EMISSION OPTICAL FILTER

Suhairi Saharudin[{1}], Mohamad Yusri Mohamad Yusof[{1}], Zharfan Hamdan[{1}], Maizatul Zolkipli[{2}], Wan Fazlida Hanim Abdullah[{2}], Sukreen Hana Herman[{2}]

[{1}]MIMOS Berhad, Malaysia; [{2}]Universiti Teknologi MARA, Malaysia

11:45
DEVELOPMENT OF A QUASI TIME STRETCH TECHNOLOGY FOR INDOOR POSITIONING SYSTEM BASED ON PULSE MODULATED ULTRA HIGH FREQUENCY RADIO
Renhai Xiong[1], Stefan van Waasen[1], Jakob Schelten[1], Mario Schloesser[1], Carl Rheinländer[2], Norbert Wehn[2]
[1]Forschungszentrum Juelich GmbH, Germany; [2]Technische Universität Kaiserslautern, Germany

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10:30 - 11:45
A2L-F: PHYSICAL SENSOR SYSTEMS
ROOM 207
SESSION CHAIRS: Zheyao Wang (Tsinghua University)
Oliver Paul (University of Freiburg)

10:30
INVITED: ATOMIC LAYER 2D NANOELECTROMECHANICAL SYSTEMS (NEMS) FOR PHYSICAL SENSING APPLICATIONS
Philip X.-L. Feng
Case Western Reserve University, USA

11:00
EVALUATING TRANSPARENT LIQUID SCREEN OVERLAY AS A HAPTIC CONDUCTOR
Ahmed Farooq[2], Grigori Evreinov[2], Roope Raisamo[2], Daisuke Takahata[1]
[1]Fukoku Japan Inc, Japan; [2]University Of Tampere, Finland

11:15
VERSATILE AIR-COUPLED PHASED ARRAY TRANSDUCER FOR SENSOR APPLICATIONS
Alexander Unger[3], Eric Konetzke[1], Matthias Rutsch[3], Maik Hoffmann[1], Sivaram Nishal Ramadas[2], Steve Dixon[4], Mario Kupnik[3]
[1]Brandenburgische Technische Universität, Germany; [2]Elster-Instromet, Belgium; [3]Technische Universität Darmstadt, Germany; [4]University of Warwick, United Kingdom

11:30
ACTIVE BIOACOUSTIC MEASUREMENT FOR HUMAN-TO-HUMAN SKIN CONTACT AREA DETECTION
Kei Nakatsuma, Ryoma Takedomi, Takaaki Eguchi, Yasutaka Oshima, Ippei Torigoe
Kumamoto University, Japan

12:00 - 13:00
MONDAY LUNCH
GRAND BALLROOM

13:00 - 14:30
A3P-G: SENSOR MODELING & CHARACTERIZATION I
ROOMS 101-110
SESSION CHAIR: Erwin Reichel (JKU University)

1-1
CHARACTERIZING CONDUCTIVE YARNS FOR PRESSURE SENSORS APPLICATIONS
Edward Grant[{2}], Frderick Livingston[{2}], Matthew Craver[{2}], Meghan Hegarty-Craver[{2}], Simon McMaster[{1}]
[{1}]Footfalls & Heartbeats Ltd., New Zealand; [{2}]North Carolina State University, USA

1-4
HEAT CONDUCTION IN MULTI-LAYER CIRCUIT ELEMENTS
Daniel Schumayer, Timothy Molteno
University of Otago, New Zealand

1-7
DESIGN OF A NEW DIFFERENTIAL SILICON RESONANT ACCELEROMETER WITH DUAL PROOFMASSES USING TWO-STAGE MICROLEVER
Cheng Li[{1}], Yue Wen[{1}], Shangchun Fan[{1}], Baoxi Kan[{2}], Chao Wang[{2}]
[{1}]Beihang University, China; [{2}]China Academy of Aerospace Electronics Technology, China

1-10
ACOUSTIC SCENE CHANGE DETECTION
Chang-Hong Lin, Ming-Yen Chen, Chen-Kuei Chang
Industrial Technology Research Institute, Taiwan

1-13
EXPERIMENTAL VERIFICATION OF A TACTILE SENSOR BASED ON IONIC POLYMER-METAL COMPOSITES
Takashi Nagai, Norihiro Kamamichi
Tokyo Denki University , Japan

1-16
PRELIMINARY DESIGN OF A MAGNETIC POSITION SENSOR BASED ON A BIOCYBERNETIC SYSTEM APPROACH
Christoph Weissinger, Hans-Georg Herzog
Technische Universität München, Germany

1-19
A CONTINUOUS CELLULAR AUTOMATON METHOD FOR THE SIMULATION OF FOCUSED ION BEAM FABRICATION OF MICRO/NANO STRUCTURES
Yuan Li[{1}], Yan Xing[{1}], Hui Zhang[{1}], Xiaoli Qiu[{1}], Miguel Gosálvez[{2}]
[{1}]Southeast University, China; [{2}]University of the Basque Country, Spain

1-21
A PLANAR COIL FLUXGATE MAGNETOMETER USING MULTI-CORE CONFIGURATION
Maha Aldoumani, Turgut Meydan, Paul Williams
Cardiff University, United Kingdom

13-251
SOFT DEFECTS LOCALIZATION BY SIGNATURE MAGNIFICATION WITH SELECTIVE WINDOWING
Soumaya Sallem[{2}], Nicolas Ravot[{1}]
[{1}]CEA LIST, France; [{2}]WiN MS, France

13-254
JAMF-BASED REPRESENTATION FOR COMPUTATIONAL LUNG SOUND ANALYSIS
Nick Michiels[{1}], Edwin Walsh[{1}], Dennis Laurijssen[{1}], Glenn Leemans[{2}], Wilfried De Backer[{2}], Jan Steckel[{1}]
[{1}]Universiteit Antwerpen, Belgium; [{2}]University Hospital Antwerp, Belgium

13-257
REDUCING MAGNETO-INDUCTIVE POSITIONING ERRORS IN A METAL-RICH INDOOR ENVIRONMENT
Orfeas Kypris, Traian Abrudan, Andrew Markham
University of Oxford, United Kingdom

13:00 - 14:30
A3P-H: ADVANCED MATERIALS FOR CHEMICAL SENSING
ROOMS 101-110
SESSION CHAIR: Ravinder Dahiya (University of Glasgow)

2-23
THE EFFECT OF SURFACE MORPHOLOGY OF ZNO NANORODS ON THE SENSING RESPONSE OF GRAPHITE/ZNO NANOROD JUNCTIONS
Roman Yatskiv, Jan Grym
Institute of Photonics and Electronics, Academy of Sciences CR, v.v.i., Czech Rep.

2-26

DETECTION OF INDIVIDUAL CO2 MOLECULES ADSORPTION WITH SUSPENDED GRAPHENE IN AN ELECTRICAL FIELD

Jian Sun, Manoharan Muruganathan, Hiroshi Mizuta
Japan Advanced Institute of Science and Technology, Japan

2-29

THIN FILM TRANSISTORS GAS SENSORS BASED ON POLY(3-HEXYLTHIOPHENE)/ ZINC OXIDE-NANORODS COMPOSITE FILM FOR NITROGEN DIOXIDE DETECTION

Tao Xie, Guangzhong Xie, Zongbiao Ye, Hongfei Du, Yuyan Chen, Yadong Jiang, Huiling Tai
University of Electronic Science and Technology of China, China

2-32

EFFECTS OF PALLADIUM NANOCRYSTAL MORPHOLOGIES ON HYDROGEN SENSORS BASED ON PALLADIUM-GRAPHENE HYDRID

Duy-Thach Phan, Gwiy-Sang Chung
University of Ulsan, Korea

2-35

ACETYLENE GAS SENSING PROPERTIES OF SILVER NANOPARTICLES DECORATED ZNO MORPHOLOGIES WITH REDUCED GRAPHENE OXIDE HYBRIDS

A.S.M. Iftekhar Uddin, Gwiy-Sang Chung
University of Ulsan, Korea

2-38

3-D NANOSTRUCTURED TUNGSTEN-OXIDE GAS-SENSING FILM VIA ANODIZING SPUTTER-DEPOSITED AL/W METAL LAYERS

Alexander Mozalev[{1}], Zdenek Pytlicek[{1}], Maria Bendova[{1}], Rosa Maria Vazquez[{2}], Eduard Llobet[{2}], Jaromir Hubalek[{1}]
[{1}]Brno University of Technology, Czech Rep.; [{2}]Universitat Rovira i Virgili, Spain

2-45

ULTRASENSITIVE FORMALDEHYDE GAS SENSORS BASED ON A HOLLOW ASSEMBLY AND ITS 3-DIMENSIONAL NETWORK FORMATION OF SINGLE-CRYSTALLINE CO3O4 NANOPARTICLES

N.-J. Choi[{1}], H.J. Park[{1}], M.Y. Jung[{1}], Dae-Sik Lee[{1}], J.-Y. Kim[{2}], J.M. Kim[{2}], H. Song[{2}]
[{1}]Electronics and Telecommunications Research Institute, Korea; [{2}]Korea Advanced Institute of Science and Technology, Korea

2-49

FUNCTIONALIZED MULTI-WALLED CARBON NANOTUBE BASED SENSORS FOR DISTRIBUTED METHANE LEAK DETECTION

Md Tanim Humayun[4], Ralu Divan[1], Liliana Stan[1], Daniel Rosenmann[1], David Gosztola[1], Lara Gundel[2], Paul Solomon[3], Igor Paprotny[4]

[1]Argonne National Laboratory, USA; [2]Lawrence Berkeley National Laboratory, USA; [3]U.S. Environmental Protection Agency, USA; [4]University of Illinois at Chicago, USA

2-51

A CAPACITIVE MICROMACHINED ULTRASONIC TRANSDUCER (CMUT) ARRAY AS A LOW-POWER MULTI-CHANNEL VOLATILE ORGANIC COMPOUND (VOC) SENSOR

Marzana Mantasha Mahmud, Mohit Kumar, Xiao Zhang, Feysel Yamaner, H. Troy Nagle, Omer Oralkan

North Carolina State University, USA

13:00 - 14:30

A3P-J: BIOSENSORS I

ROOMS 101-110

SESSION CHAIR: Sung-Hoon Choa (Seoul National University Of Science And Technology)

3-55

DESIGN, FABRICATION AND PERFORMANCE EVALUATION OF INTERDIGITAL CAPACITIVE SENSOR FOR DETECTION OF CARDIAC TROPONIN-I AND HUMAN EPIDERMAL GROWTH FACTOR RECEPTOR 2

Divya Mahalingam, Yasar Gurbuz, Anjum Qureshi, Javed H. Niazi

Sabanci University, Turkey

3-58

NONINVASIVE MEASUREMENT OF AQUEOUS GLUCOSE SOLUTION AT PHYSIOLOGICALLY RELEVANT BLOOD CONCENTRATION LEVELS WITH DIFFERENTIAL CONTINUOUS-WAVE LASER PHOTOACOUSTIC TECHNIQUE

Yujiro Tanaka, Yuichi Higuchi, Serge Camou

Nippon Telegraph and Telephone Corporation, Japan

3-61

ELECTRODELESS, NON-INVASIVE STIMULATION OF RETINAL NEURONS USING TIME-VARYING MAGNETIC FIELDS

Jong Yoon Shin[2], Jae-Hyun Ahn[2], Kilhwa Pi[2], Dong-Il Cho[2], Yong Sook Goo[1]

[1]Chungbuk National University, Korea; [2]Seoul National University, Korea

3-64

A BIOMICROSYSTEM FOR SIMULTANEOUS OPTICAL AND ELECTROCHEMICAL MONITORING OF ELECTROACTIVE MICROBIAL BIOFILM

Arwa Fraiwan, Seokheun Choi
Binghamton University, State University of New York, USA

3-67

TRACE LEVEL VOC GAS DETECTION OF DEVELOPED CNT BASED MICROPRECONCENTRATOR FOR BREATH ANALYSIS

Koji Oyama[{2}], Ryohei Komiyama[{2}], Hidetoshi Miyashita[{2}], Sang-Seok Lee[{2}], Jeong-O Lee[{1}]
[{1}]Korea Research Institute of Chemical Technology, Japan; [{2}]Tottori University, Japan

3-70

FAST AND LOW-COST DETECTION OF SILVER NANOPARTICLES BY USING THE AG+-SPECIFIC CYTOSINE PROBE

Joonhyub Kim, Namki Min
Korea University, Korea

3-73

SINGLE-LOOP FIBER ATR SENSOR ENHANCED BY SILVER NANOPARTICLES FOR CONTINUOUS GLUCOSE MONITORING

Yanwen Sun[{2}], Changyue Sun[{2}], Haixia Yu[{2}], Dachao Li[{2}], Songlin Yu[{1}]
[{1}]Tianjin Institute of Metrological Supervision Testing, China; [{2}]Tianjin University, China

3-76

SENSITIVE AND QUANTITATIVE DNA DETECTION BY BEADS-BASED DIELECTROPHORETIC IMPEDANCE MEASUREMENT

Michihiko Nakano, Hiromichi Kasahara, Zhenhao Ding, Junya Suehiro
Kyushu University, Japan

3-79

DESIGN AND FABRICATION OF SIO2 WAVEGUIDE-BASED SAW SENSORS WITH FILLED MICROCAVITIES

Shuangming Li[{3}], Mandek Richardson[{4}], Subramanian Sankaranarayanan[{1}], Chunhai Fan[{2}], Yan Su[{2}], Venkat Bhethanabotla[{4}]
[{1}]Argonne National Laboratory, USA; [{2}]Nanjing University of Science and Technology, China; [{3}]Nanjing University of Science and Technology & University of South Florida, China; [{4}]University of South Florida, USA

3-82
DEVELOPMENT OF FLEXIBLE DRY ECG ELECTRODES BASED ON MWCNT/PDMS COMPOSITE
Amer Abdulmahdi Chlaihawi, Binu Baby Narakathu, Sepehr Emamian, Ali Eshkeiti, Sai Guruva Avuthu Reddy, Bradley Bazuin, Massood Zandi Atashbar
Western Michigan University, USA

13-260
WEARABLE WIRELESS SENSOR FOR ESTRUS DETECTION IN COWS BY CONDUCTIVITY AND TEMPERATURE MEASUREMENTS
Lars Mattias Andersson{2}, Hironao Okada{2}, Yi Zhang{2}, Toshihiro Itoh{2}, Ryotaro Miura{1}, Koji Yoshioka{1}
{1}National Agriculture and Food Research Organization, Japan; {2}National Institute of Advanced Industrial Science and Technology, Japan

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13:00 - 14:30
A3P-K: OPTICAL SENSORS I
ROOMS 101-110
SESSION CHAIR: Rihito Kuroda (Tohoku University)

4-86
PIEZO-PHOTOTRONIC UV PHOTOSENSING WITH ZNO NANOWIRES ARRAY
Yuanjie Su, Guangzhong Xie, Tao Xie, Yin Long, Zongbiao Ye, Xiaosong Du, Zhiming Wu, Yadong Jiang
University of Electronic Science and Technology of China, China

4-89
USE OF METAL MESH SENSORS WITH PERIODIC MICROSTRUCTURES TO SENSE AND SEPARATE AEROSOL PARTICLES IN KENYA
Koki Yamamoto{2}, Emi Kitanishi-Shirai{2}, Yuka Inoue{2}, Makoto Hasegawa{2}, Ernest Wandera{3}, Yoshio Ichinose{3}, Seiji Kanba{1}, Takashi Kondo{1}
{1}Murata Manufacturing Company, Japan; {2}Nagahama Institute of Bio-Science and Technology, Japan; {3}Nagasaki University, Japan

4-92
A PROPOSED OPTICAL-BASED SENSOR FOR ASSESSMENT OF HAND MOVEMENT
Lefan Wang, Turgut Meydan, Paul Williams, Tomasz Kutrowski
Cardiff University, United Kingdom

4-95
NEW SETUP FOR A REAL TIME HIGH RESOLUTION UV-LED ABSORPTION SPECTROSCOPY
Eric Ebert, Nils Damaschke, Hendrik Krüger, Hartmut Ewald, Marian Rabe
Universität Rostock, Germany

4-98
RAMAN SPECTROSCOPY FOR ANALYZING ANTHOCYANINS OF LYOPHILIZED BLUEBERRIES
Belén Gordillo Arrobas[{2}], Leonardo Ciaccheri[{1}], Andrea Azelio Mencaglia[{1}], Francisco J. Rodríguez-Pulido[{2}], Carla Stinco[{2}], Maria Lourdes González-Miret[{2}], Francisco J. Heredia[{2}], Anna Grazia Mignani[{1}]
[{1}]CNR - Istituto di Fisica Applicata Nello Carrara, Italy; [{2}]Universidad de Sevilla, Spain

4-101
PHOTONIC CRYSTAL BASED FORCE SENSOR ON SILICON MICROCANTILEVER
Sreenivasulu Tupakula, V R Kolli, Anusree K, Yadunath Tr, Badrinarayana T, Talabattulla Srinivas, Gopal Krishna Hegde, S Mohan
Indian Institute of Science, India

4-104
MAGNETIC FIELD SENSOR BASED ON A SINGLE MODE-MULTIMODE-SINGLE MODE OPTICAL FIBER STRUCTURE
Joaquin Ascorbe, Jesus Maria Corres, Francisco Javier Arregui, Ignacio R. Matías-Maestro
Universidad Pública de Navarra, Spain

13:00 - 14:30
A3P-L: MECHANICAL, MAGNETIC & PHYSICAL SENSORS I
ROOMS 101-110
SESSION CHAIR: Joseph Talghader (University of Minnesota)

5-105
VERY HIGH DISPLACEMENT TO VOLTAGE RATIO MEMS THERMAL ACTUATOR
Kyuhyun Kwack, Kukjin Chun
Seoul National University, Korea

5-107
ELIMINATION OF NONLINEARITY IN SIGMA DELTA MEMS ACCELEROMETER
Yixing Chu, Yunfeng Liu, Jingxin Dong, Baoyong Chi
Tsinghua University, China

5-109
ULTRA-THIN FILM PIEZOELECTRIC ALN CANTILEVERS FOR FLEXIBLE MEMS SENSORS
Md Sajeeb Rayhan, Donald Butler, Zeynep Celik-Butler
University of Texas at Arlington, USA

5-111
TOWARDS RESONANT SENSING IN LIQUIDS BY USING CMOS MEMS CAPACITIVE OSCILLATORS
Mu-Chi Chou, Che-Hao Chiang, Michael S.-C. Lu
National Tsing Hua University, Taiwan

5-113
REDUCTION OF CONTACT FORCE DEPENDENCE ON THE MEMS HARDNESS SENSOR USING REFERENCE PLANE TO DETECT HUMAN BODY HARDNESS
Yusaku Maeda, Kyohei Terao, Fusao Shimokawa, Hidekuni Takao
Kagawa University, Japan

5-115
A PDMS BASED TRIBOELECTRIC ENERGY HARVESTER AS SELF-POWERED, ACTIVE TACTILE SENSOR SYSTEM FOR HUMAN SKIN
Mohammad Sala Uddin Rasel, Miah A. Halim, Jae Yeong Park
Kwangwoon University, Korea

5-117
A CMOS STRESS SENSOR CHIP WITH INTEGRATED SIGNAL PROCESSING CIRCUITS
Shujie Yang{2}, Dong Wu{2}, Zheyao Wang{2}, Xiaoming Li{1}
{1}Langfang Teachers University, China; {2}Tsinghua University, China

5-119
EXTRACTION OF HEARTBEAT SIGNAL FROM AIRFLOW AT MOUTH BY FLOW SENSOR
Hidetaka Kawaoka{1}, Takayuki Yamada{2}, Miyoko Matsushima{2}, Tsutomu Kawabe{2}, Yoshihiro Hasegawa{1}, Mitsuhiro Shikida{1}
{1}Hiroshima City University, Japan; {2}Nagoya University, Japan

5-121
RESPONSIBLE TIME SHORTING OF FLEXIBLE THERMAL FLOW SENSOR FOR MEDICAL APPLICATIONS
Kodai Imaeda{2}, Shunji Shibata{2}, Miyoko Matsushima{2}, Tsutomu Kawabe{2}, Mitsuhiro Shikida{1}
{1}Hiroshima City University, Japan; {2}Nagoya University, Japan

13:00 - 14:30
A3P-M: SENSOR SYSTEMS
ROOMS 101-110
SESSION CHAIR: Kenichi Takahata (University of British Columbia)

6-123
IN-PLANE BULK-MICROMACHINING FABRICATION OF HIGH DYNAMIC RANGE TACTICAL GRADE OPEN LOOP AND CLOSED LOOP MEMS ACCELEROMETERS
Aviram Feingold, Boris Grinberg
Physical Logic Ltd., Israel

6-125
TOWARD A WIRELESS CONTACT LENS SENSOR SYSTEM WITH A MICRO-CAPACITOR FOR INTRAOCULAR PRESSURE MONITORING ON IN-VITRO PORCINE EYE
Guan-Ting Yeh, Tsung-Wei Wu, Shang-Wei Tsai, Shun-Hsi Hsu, Jin-Chern Chiou
National Chiao Tung University, Taiwan

6-127
MICROMACHINED SILICON HEMISPHERICAL RESONATORS WITH SELF-ALIGNED SPHERICAL CAPACITIVE ELECTRODES
Xuye Zhuang{1}, Xinlong Wang{1}, Lei Yu{1}, Pinghua Li{1}, Bo Chen{1}, Qunying Guo{1}, Shuwen Guo{2}
{1}East China Institute of Photo-Electronic IC, China; {2}Soochow University, China

6-129
NOVEL PCB-BASED THERMAL FLOW SENSORS FOR AIR CONDITIONING SYSTEMS
Thomas Glatzl{1}, Samir Cerimovic{1}, Harald Steiner{1}, Almir Talic{1}, Artur Jachimowicz{1}, Thilo Sauter{1}, Franz Keplinger{2}
{1}Danube University Krems, Austria; {2}Technische Universität Wien, Austria

6-131
TEMPERATURE ROBUSTNESS DESIGN FOR DOUBLE-CLAMPED MEMS SENSORS BASED ON TWO ORTHOGONAL STRESS-IMMUNITY STRUCTURE
Xinghua Wang, Dingbang Xiao, Zhanqiang Hou, Qingsong Li, Zhihua Chen, Xuezhong Wu
National University of Defense Technology, China

6-133
ELECTROCHEMICAL VIBRATION SENSOR WITH FORCE BALANCE FEEDBACK SYSTEM
Junbo Wang, Zhengyu Zhang, Guanglei Li, Deyong Chen, Jian Chen
Institute of Electronics, Chinese Academy of Sciences, China

6-135
TEMPERATURE DEPENDENCE OF THE QUALITY FACTOR IN LC-TYPE PASSIVE WIRELESS TEMPERATURE SENSORS
Qing-Ying Ren, Li-Feng Wang, Qing-An Huang
Southeast University, China

6-137
DETECTION OF ULTRASOUND PRESSURE DISTRIBUTION FOR REMOTE MEASUREMENT OF HAPTIC SURFACE ROUGHNESS
Takaaki Kamigaki, Kei Nakatsuma, Yasutaka Oshima, Ippei Torigoe
Kumamoto University, Japan

6-139
MEMS µ-WIRE MAGNETIC FIELD DETECTION METHOD@CERN
Michael Stifter[{1}], Harald Steiner[{1}], Wilfried Hortschitz[{1}], Thilo Sauter[{1}], Thomas Glatzl[{1}], Alexander Dabsch[{2}], Franz Keplinger[{2}]
[{1}]Danube University Krems, Austria; [{2}]Technische Universität Wien, Austria

6-141
SAW DEVICE FOR LIQUID VAPORIZATION RATE AND REMAINING MOLECULE SENSING
Thu Hang Bui[{1}], Bruno Morana[{1}], An Tran[{1}], Tom Scholtes[{1}], Trinh Chu Duc[{2}], Pasqualina M. Sarro[{1}]
[{1}]Technische Universiteit Delft, Netherlands; [{2}]University of Engineering and Technology, VNU, Hanoi, Vietnam

6-143
A MINIATURE SYSTEM FOR PARTICULATE MATTER (PM) MEASUREMENT
Jianwen Sun[{2}], Zewen Liu[{2}], Kun Yang[{1}], Yanwu Lu[{1}]
[{1}]Beijing Jiaotong University, China; [{2}]Tsinghua University, China

6-145
NON-INVASIVE MONITORING OF ELECTRICAL PARAMETERS OF SCHEFFLERA ARBORICOLA LEAF
Kushagra Sinha, Olutosin Fawole, Massood Tabib-Azar
University of Utah, USA

6-147
A PORTABLE E-NOSE SYSTEM FOR CLASSIFICATION OF CHINESE LIQUOR
Peifeng Qi, Qinghao Meng, Yu Zhou, Yaqi Jing, Ming Zeng
Tianjin University, China

6-149
THE FLUID VISCOSITY MEASUREMENT BASED ON VARIABLE CROSS-SECTION MEMS CANTILEVER UNDER TORSIONAL EXCITATION
Yingjie Hu, Libo Zhao, Tongdong Wang, Yulong Zhao, Guoying Yuan, Zhuangde Jiang
Xi'an Jiaotong University, China

6-151
DEVELOPMENT OF PATCH-TYPE SENSOR MODULE FOR BATTERY-FREE POWER TRANSFER AND DATA TRANSMISSION
Janghyun Lee, Young Su Kim, Woo Young Kim, Youn Tae Kim
Chosun University, Korea

6-153
HIGHLY SENSITIVE CAPACITIVE TACTILE SENSOR BASED ON SILVER NANOWIRE USING PARYLENE-C STENCIL PATTERNING METHOD
Youngseok Kim, Namsun Chou, Sohee Kim
Gwangju Institute of Science and Technology, Korea

13:00 - 14:30
A3P-N: SENSOR NETWORK AND APPLICATION I
ROOMS 101-110
SESSION CHAIR: Ryutaro Maeda (AIST)

7-157
ENABLING MODULAR PLUG&PLAY WIRELESS SENSOR AND ACTUATOR NETWORK NODES: SOFTWARE ARCHITECTURE
Konstantin Mikhaylov, Anton Paatelma
University of Oulu, Finland

7-160
CONFIGURING ARTIFICIAL NEURAL NETWORKS FOR THE PREDICTION OF AVAILABLE ENERGY IN SOLAR-POWERED SENSOR NODES
Florian Gebben, Sebastian Bader, Bengt Oelmann
Mid Sweden University, Sweden

7-162
GDOP INDEX IN UWB INDOOR LOCATION SYSTEM EXPERIMENT
Gaoang Feng, Chong Shen, Chunhua Long, Fang Dong
Hainan University, China

7-165
ANALYSIS OF THE NLOS CHANNEL ENVIRONMENT OF TDOA MULTIPLE ALGORITHMS
Jie Zhang, Fang Dong, Gaoang Feng, Chong Shen
Hainan University, China

7-167
SENSOR NETWORK SERIAL COMMUNICATION SYSTEM WITH HIGH TOLERANCE TO TIMING AND TOPOLOGY VARIATIONS
Travis Bartley[2], Shuji Tanaka[2], Yutaka Nonomura[1], Takahiro Nakayama[4], Yoshiyuki Hata[3], Masanori Muroyama[2]
[1]Meijo University & Toyota Central R&D Labs. Inc., Japan; [2]Tohoku University, Japan; [3]Toyota Central R&D Labs. Inc., Japan; [4]Toyota Motor Corporation, Japan

7-170
AUGMENTED DTN BASED ENERGY EFFICIENT ROUTING PROTOCOL FOR VEHICULAR AD HOC NETWORKS
Balasubramanian Paramasivan, M Bhuvaneswari, K Mohaideen Pitchai
National Engineering College, India

7-172
MODEL-BASED RENDEZVOUS CALIBRATION OF MOBILE SENSOR NETWORKS FOR MONITORING AIR QUALITY
Adrian Arfire, Ali Marjovi, Alcherio Martinoli
École Polytechnique Fédérale de Lausanne, Switzerland

7-174
PATH PREDICTION-BASED SENSOR FILTERING METHOD
Sukhoon Lee[1], Dongwon Jeong[2], Doo-Kwon Baik[1]
[1]Korea University, Korea; [2]Kunsan National University, Korea

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13:00 - 14:30
A3P-P: MECHANICAL, MAGNETIC AND PHYSICAL SENSING APPLICATIONS
ROOMS 101-110
SESSION CHAIR: Byeongha Lee (Gwangju Institute of Science and Technology)

8-175
DESCRIPTION AND RECOGNITION BASED ON DIRECTIONAL MOTION VECTOR FOR SPATIAL HAND GESTURES
Kyoung-Ju Noh, Dong-Woo Lee, Hyun-Tae Jeong
Electronics and Telecommunications Research Institute, Korea

8-177
A SMALL ACOUSTIC GONIOMETER TARGETED FOR INFRASONIC MEASUREMENTS
Michael Pook, Sin Ming Loo
Boise State University, USA

8-180
INERTIAL SENSING FOR GAIT ANALYSIS AND THE SCOPE FOR SENSOR FUSION
Tahmina Zebin, Patricia J. Scully, Krikor B. Ozanyan
University of Manchester, United Kingdom

8-182
A NOVEL FREQUENCY TUNING DESIGN FOR VIBRATION-DRIVEN ELECTROMAGNETIC ENERGY HARVESTER
Byung-Chul Lee, Gwiy-Sang Chung
University of Ulsan, Korea

8-184
PORE WATER PRESSURE SENSOR FOR LANDSLIDE PREDICTION
Cristian Zet, Cristian Fosalau, Daniel Petrisor
Gheorghe Asachi Technical University of Iasi, Romania

8-187
SINGLE IMAGE SUPER RESOLUTION INFRARED CAMERA USING CARBON NANOTUBE PHOTODETECTOR
Liangliang Chen[{1}], Zhanxin Zhou[{1}], Liangjian Deng[{2}], Ning Xi[{1}], Bo Song[{1}], Yongliang Yang[{1}], Yujie Hao[{1}], Zhiyong Sun[{1}]
[{1}]Michigan State University, USA; [{2}]University of Electronic Science and Technology of China, China

8-189
DOWNHOLE VISCOSITY MEASUREMENT PLATFORM USING TUNING FORK OSCILLATORS
Miguel González[{1}], Greg Ham[{1}], Ali Al Haddad[{2}], Greg Bernero[{1}], Max Deffenbaugh[{1}]
[{1}]Aramco Services Company, USA; [{2}]University of Michigan, USA

8-191
ELECTROMAGNETICALLY CONTROLLED CONVEX MICROMIRROR FOR FOCAL LENGTH VARIATION
Md. Mahabub Hossain, Wu Bin, Seong Ho Kong
Kyungpook National University, Korea

8-193
A NOVEL MEMS CHIP-BASED ATMOSPHERIC ELECTRIC FIELD SENSOR FOR LIGHTNING HAZARD WARNING APPLICATIONS
Pengfei Yang[{3}], Bo Chen[{1}], Xiaolong Wen[{4}], Chunrong Peng[{1}], Shanhong Xia[{2}], Yilong Hao[{3}]
[{1}]Chinese Academy of Sciences, China; [{2}]Institute of Electronics, Chinese Academy of Sciences, China; [{3}]Peking University, China; [{4}]Tsinghua University, China

8-195
A BAROMETER-IMU FUSION METHOD FOR VERTICAL VELOCITY AND HEIGHT ESTIMATION
Youngbin Son, Seyoung Oh
Pohang University of Science and Technology, Korea

8-197
NON-CONTACT ELECTRIC-COUPLING-BASED AND MAGNETIC-FIELD-SENSING-ASSISTED TECHNIQUE FOR MONITORING VOLTAGE OF OVERHEAD POWER TRANSMISSION LINES
Ke Zhu, Wing Kin Lee, Wing Tat Pong
University of Hong Kong, Hong Kong

8-199
OPTIMIZING PRESSURE SENSOR ARRAY DATA FOR A SMART-SHOE FALL MONITORING SYSTEM
Janet Light, Sangwhan Cha, Maksudul Alam Chowdhury
University of New Brunswick, Canada

8-201
AGE DETECTION OF LUBRICATING OIL WITH ON-LINE SENSORS
Ying Du, Tonghai Wu, Jun Cheng
Xi'an Jiaotong University, China

8-203
DETECTION OF ABNORMAL NOISES FROM TAPERED ROLLER BEARINGS BY A SOUND SENSING SYSTEM
Zhiyi Zhang{2}, Daoyong Sun{1}, Yinling Wang{1}, Feng Xu{1}, Zhangliang Xu{2}, Xiaochuan Xie{2}, Hui Chen{2}, Yong Yuan{2}
{1}CSR Sifang Co Ltd., China; {2}Southwest Jiaotong University, China

8-205
AN 8-CHANNELS 0.13µM-CMOS FRONT-END FOR ATLAS MDT-DETECTORS
Marcello De Matteis{2}, Federica Resta{2}, Robert Richter{1}, Hubert Kroha{1}, Markus Fras{1}, Yazhou Zhao{1}, Varuzhan Danielyan{1}, Sergey Abovyan{1}, Andrea Baschirotto{2}
{1}Max-Planck-Institute for Physics, Germany; {2}Università degli Studi di Milano-Bicocca, Italy

8-207
THE IOT WEARABLE STRETCH SENSOR USING 3D-GRAPHENE FOAM
Natthapol Watthanawisuth, Thitima Maturos, Assawapong Sappat, Adisorn Tuantranont
National Electronics and Computer Technology Center, Thailand

8-210
ON-SITE NON-INVASIVE CURRENT MONITORING OF UNDERGROUND POWER CABLES WITH A MAGNETIC FIELD SENSING PLATFORM AT A SUBSTATION
Ke Zhu[2], Cher Leung Sum[1], Wing Kin Lee[2], Wing Tat Pong[2]
[1]Hongkong Electric Company Ltd, Hong Kong; [2]University of Hong Kong, Hong Kong

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13:00 - 14:30
A3P-Q: OTHER SENSORS TOPICS I
ROOMS 101-110
SESSION CHAIR: Sung-Hoon Choa (Seoul National University of Science And Technology)

9-212
ZNO ACTIVATION OF ALUMINUM FOR ENERGY GENERATION IN PHYSIOLOGICAL SALINE BUFFER
Gymama Slaughter, Brian Stevens, Larry Morton Jr.
University of Maryland Baltimore County, USA

9-215
OPTICAL MOUSE AS PH ANALYZER
Altamash Fakki[2], Salahaldein Ahmed[2], Jongwon Park[1], Chang-Soo Kim[2]
[1]Kyungil University, Korea; [2]Missouri University of Science and Technology, USA

9-218
CNC MACHINING OF LITHIUM NIOBATE FOR RAPID PROTOTYPING OF SENSORS
Zeyad Al-Shibaany, Zi Choong, Dehong Huo, John Hedley, Zhongxu Hu
Newcastle University, United Kingdom

9-221
COMPENSATION OF THZ SPECTRUM SPURIOUS OSCILLATIONS BY LOCAL APODIZATION
Miguel Angel Bañuelos-Saucedo
Universidad Nacional Autónoma de México, Mexico

9-224
DEVELOPMENT OF A HIGH-GAIN HIGH-ISOLATION LOW-POWER RECEIVER FOR WIRELESS BODY AREA SENSOR NETWORK APPLICATION SYSTEM
I-Yu Huang[2], Wen-Hui Huang[2], Ren-Wu Luo[2], Je-Wei Lan[2], Chia-Hsu Hsieh[2], Yu-Cheng Lin[1]
[1]National Cheng Kung University, Taiwan; [2]National Sun Yat-sen University, Taiwan

9-227

AN AUTOMATED, SELF SUSTAINED SOIL MOISTURE MEASUREMENT SYSTEM USING LOW POWER DUAL PROBE HEAT PULSE (DPHP) SENSOR

Vinay Palaparthy, Shahbaz Sarik, Aakash Mehta, Kamlesh Singh, Maryam Baghini
Indian Institute of Technology Bombay, India

9-230

OXIDE OR METAL INTERFACE DAMAGE IMPROVEMENT OF DEEP SILICON ETCH PROCESS BY LOW POWER RF OF LOW FREQUENCY

Shyh-Wei Cheng{1}, Jui-Chun Weng{2}, Chung-Hsien Hung{2}, Chun-Peng Li{2}, Chin-Hau Meng{2}, Kai-Chih Liang{1}, Weileun Fang{1}
{1}National Tsing Hua University, Taiwan; {2}Taiwan Semiconductor Manufacturing Company, Limited, Taiwan

9-233

FABRICATION OF TIO2 NANOTUBE ON SILICON SUBSTRATE BY TWO-STEP ANODIC OXIDATION FOR WAFER LEVEL SUPERCAPACITORS APPLICATION

Gang Li{2}, Junhui Zhang{2}, Lifang Guo{2}, Qinghua Zhao{2}, Wendong Zhang{2}, Jie Hu{2}, Wei Sun{1}
{1}Hyperion electronics technology Wuxi Co., China; {2}Taiyuan University of Technology, China

9-236

A THIN FILM FLEXIBLE THERMOELECTRIC GENERATOR WITH A FULLY ELECTRICAL, LOW STARTUP VOLTAGE AND HIGH EFFICIENCY DC - DC CONVERTER

Carlo Veri{2}, Mirko Pasca{2}, Stefano D'Amico{2}, Luca Francioso{1}, Chiara De Pascali{1}, Pietro Siciliano{1}
{1}National Research Council of Italy, Italy; {2}Università del Salento, Italy

9-239

A LOW-POWER WIRELESS BONDWIRE INERTIAL SENSOR SYSTEM

Shih-Chieh Huang{2}, Shao-Yung Lu{1}, Fu-Yuan Cheng{2}, Tsung-Heng Tsai{2}, Yu-Te Liao{1}
{1}National Chiao Tung University, Taiwan; {2}National Chung Cheng University, Taiwan

9-242

COMPOSITE RUBBER ELECTRET WITH PIEZOELECTRIC 31 AND 33 MODES FOR ELASTICALLY ELECTROMECHANICAL SENSORS

Jhih-Jhe Wang, Hao-Yu Liang, Weileun Fang, Yu-Chuan Su
National Tsing Hua University, Taiwan

9-248
3D PRINTED FEATURES IN THE 100 µM RANGE FOR APPLICATION IN SENSING
Jort Verhaar, Remco Sanders, Gijs Krijnen
Universiteit Twente, Netherlands

13:00 - 14:30
A3P-R: LIVE DEMONSTRATIONS
SPECIAL POSTERS
SESSION CHAIR: Sandro Carrara (EPFL)

A
MODULAR MULTI-RADIO WIRELESS SENSOR PLATFORM WITH PLUG&PLAY MODULES CONNECTION
Konstantin Mikhaylov, Juha Petäjäjärvi, Marko Mäkeläinen, Anton Paatelma, Tuomo Hänninen
University of Oulu, Finland

B
PROSTHETIC HANDS CONTROLLED WITH A HIGHLY USABLE SEMG SENSOR
Shintaro Sakoda, Yoshiko Yabuki, Yinlai Jiang
University of Electro-Communications, Japan

C
UPPER LIMB PROSTHETIC CONTROL USING TOE GESTURE SENSORS AND VARIOUS TOUCH INTERFACES
Ravinder Dahiya
University of Glasgow, United Kingdom

D
LIVE DEMONSTRATION OF A MUTUAL-CAPACITIVE TOUCH SENSOR ROIC USING A PLL TO REDUCE LCD NOISE BY SYNCHRONIZING ROIC TX CLOCK TO LCD CLOCK
Dong-Hee Yeo, Seon-Ho Kim, Hyeon-Kyu Noh, Jae-Yoon Sim, Byungsup Kim, Hong-June Park
Pohang University of Science and Technology, South Korea

E
MICROSYSTEM INTEGRATION OF A PALLADIUM-BASED MEMS HYDROGEN GAS SENSOR
(related conference paper id 1704)
Thomas Walewyns{2}, Carl Emmerechts{1}, Pierre Gérard{2}, Nicolas André{2}, Laurent A. Francis{2}
{1}Sirris, Belgium; {2}Université catholique de Louvain, Belgium

F
RIPPLE SORT' ALGORITHM, CIRCUIT IMPLEMENTATION AND VERIFICATION USING VHDL SYNTHESISABLE TESTBENCH VERIFICATION TECHNIQUE
Ching Man{1}, Elfed Lewis{2}, Brian Moss{2}
{1}Analog Devices, Inc. / University Of Limerick, Ireland; {2}University of Limerick, Ireland

G

LDV_UPI SYSTEM FOR STRUCTURAL HEALTH MONITORING OF COMPOSITE MATERIAL

Thanh Chung Truong[{2}], Jae-Yoon Park[{2}], Jae Kyeong Jang[{1}], Jung Ryul Lee[{2}]

[{1}]Chonbuk National University, Korea; [{2}]Korea Advanced Institute of Science and Technology, Korea

H

CMOS BEOL-EMBEDDED 3-AXIS ACCELEROMETER

Piotr Michalik[{2}], Josep Maria Sánchez-Chiva[{2}], Daniel Fernández[{1}], Jordi Madrenas[{2}]

[{1}]Nanusens, Spain; [{2}]Universitat Politecnica de Catalunya, Spain

I

A NEW ADAPTIVE FRONT-END READOUT CIRCUIT FOR HIGH-RESOLUTION MAGNETIC SCALES

Ping-Chieh Chien, Yung-Hua Kao, Hong-Yang Chen, Jing-Hao Huang, Paul C.-P. Chao, Chin-Long Wey

National Chiao Tung University, Taiwan

14:30 - 16:00

A4L-A: PRINTED AND FLEXIBLE CHEMICAL SENSORS

ROOM 201

SESSION CHAIRS: Massood Atashbar (Western Michigan University)

Ravinder Dahiya (University of Glasgow)

14:30

DEVELOPMENT OF SCREEN PRINTED ELECTROCHEMICAL SENSORS FOR SELECTIVE DETECTION OF HEAVY METALS

Sai Guruva Reddy Avuthu, Jared Thomas Wabeke, Binu Baby Narakathu, Dinesh Maddipatla, Ali Eshkeiti, Sepehr Emamian, Amer Abdulmahdi Chlaihawi, Margaret Joyce, Sherine Obare, Massood Zandi Atashbar

Western Michigan University, USA

14:45

DETECTION OF HEAVY METAL IONS USING SCREEN PRINTED WIRELESS LC SENSOR

Sai Guruva Reddy Avuthu, Jared Thomas Wabeke, Binu Baby Narakathu, Dinesh Maddipatla, Sepehr Emamian, Ali Eshkeiti, Amer Abdulmahdi Chlaihawi, Bradley Bazuin, Sherine Obare, Massood Zandi Atashbar

Western Michigan University, USA

15:00

DISPOSABLE BREATH TUBES WITH ON-TUBE NANOWIRE SENSOR ARRAY FOR NON-INVASIVELY ON-SITE SENSING OF LUNG CANCER BIOMARKER

Chung-Hsuan Wu, Shih-Pang Wang, Chien-Chong Hong

National Tsing Hua University, Taiwan

15:15
INKJET-PRINTED DUAL MICROFLUIDIC-BASED SENSOR INTEGRATED SYSTEM
Wenjing Su[{1}], James Cooper[{1}], Benjamin Cook[{1}], Manos Tentzeris[{1}], Chiara Mariotti[{2}], Luca Roselli[{2}]
[{1}]Georgia Institute of Technology, USA; [{2}]Università degli Studi di Perugia, Italy

15:30
A FLEXIBLE ELECTROCHEMICAL SENSOR MODIFIED BY GRAPHENE AND AUNPS FOR CONTINUOUS GLUCOSE MONITORING
Zhihua Pu, Ridong Wang, Kexin Xu, Dachao Li, Haixia Yu
Tianjin University, China

15:45
CARBON NANOTUBE BASED GAS SENSOR ARRAYS ON RIGID AND FLEXIBLE SUBSTRATES
Ahmed Abdelhalim, Florin Loghin, Maximilian Winkler, Christopher Zeiser, Alaa Abdellah, Paolo Lugli
Technische Universität München, Germany

14:30 - 16:00
A4L-B: ACCELEROMETERS
ROOM 202
SESSION CHAIRS: Koichi Awazu (AIST)
Yogesh Gianchandani (University of Michigan)

14:30
A SUB-1G CMOS-MEMS ACCELEROMETER
Daisuke Yamane[{2}], Toshifumi Konishi[{1}], Motohiro Takayasu[{2}], Hiroyuki Ito[{2}], Shiro Dosho[{2}], Noboru Ishihara[{2}], Hiroshi Toshiyoshi[{3}], Kazuya Masu[{2}], Katsuyuki Machida[{2}]
[{1}]NTT Advanced Technology Corporation, Japan; [{2}]Tokyo Institute of Technology, Japan; [{3}]University of Tokyo, Japan

14:45
A TUNABLE DIGITALLY OPERATED MEMS ACCELEROMETER
Varun Kumar, Xiaobo Guo, Roozbeh Jafari, Siavash Pourkamali
University of Texas at Dallas, USA

15:00
DESIGN AND FABRICATION OF SELF-PACKAGED, FLEXIBLE MEMS ACCELEROMETER
Sohel Mahmood, Zeynep Celik-Butler, Donald Butler
University of Texas at Arlington, USA

15:15
A SIMPLE OUT-OF-PLANE CAPACITIVE MEMS ACCELEROMETER UTILIZING LATERAL AND VERTICAL ELECTRODES FOR DIFFERENTIAL SENSING
Yunus Terzioglu, Talha Kose, Kivanc Azgin, Tayfun Akin
Middle East Technical University, Turkey

15:30
FABRICATION OF A THREE-AXIS CAPACITIVE MEMS ACCELEROMETER ON A SINGLE SUBSTRATE
Akin Aydemir, Tayfun Akin
Middle East Technical University, Turkey

15:45
DIGITAL OUTPUT FLEXIBLE TILT SENSOR WITH CONDUCTIVE MICROSPHERES
Lars Büthe[{1}], Christian Vogt[{1}], Luisa Petti[{1}], Giuseppe Cantarella[{1}], Gerhard Tröster[{1}], Niko Münzenrieder[{2}]
[{1}]Eidgenössische Technische Hochschule Zürich, Switzerland; [{2}]University of Sussex, United Kingdom

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14:30 - 16:00
A4L-C: MOTION AND LOCATION TRACKING
ROOM 203
SESSION CHAIRS: Darrin Young (University of Utah)
Andrei Shkel (University of California, Irvine)

14:30
ENHANCED TRACKING SYSTEM BASED ON MICRO INERTIAL MEASUREMENTS UNIT TO TRACK SENSORIMOTOR RESPONSES IN PIGEONS
Noor Aldoumani, Turgut Meydan, Christopher Dillingham, Jonathan Erichsen
Cardiff University, United Kingdom

14:45
HUMAN GAIT MONITORING USING BODY-WORN INERTIAL SENSORS AND KINEMATIC MODELLING
Amin Ahmadi[{1}], Francois Destelle[{1}], David Monaghan[{1}], Kieran Moran[{1}], Noel O'Connor[{1}], Luis Unzueta[{2}], Maria Teresa Linaza[{2}]
[{1}]Dublin City University, Ireland; [{2}]Vicomtech-IK4, Spain

15:00
EFFICIENT CHARACTERIZATION OF TENNIS SHOTS AND GAME ANALYSIS USING WEARABLE SENSORS DATA
Rupika Srivastava[{1}], Ayush Patwari[{1}], Sunil Kumar[{1}], Gaurav Mishra[{1}], Lakshmi Kaligounder[{1}], Purnendu Sinha[{2}]
[{1}]Samsung R&D Institute, India; [{2}]Samsung R&D Institute India Pvt. Ltd., India

15:15
HIDDEN MARKOV MODEL BASED DRIVING EVENT DETECTION AND DRIVER PROFILING FROM MOBILE INERTIAL SENSOR DATA
Saurabh Daptardar, Vignesh Lakshminarayanan, Sharath Reddy, Suraj Nair, Saswata Sahoo, Purnendu Sinha
Samsung R&D Institute India Pvt. Ltd., India
15:30
NOVEL MULTIPLE-FUNCTIONAL IMU-BASED WEARABLE AIR MOUSE FOR THE SIMULTANEOUS OPERATION WITH (AIR) KEYBOARDS
Hebeom Han, Sang Won Yoon
Hanyang University, Korea

15:45
AN EMG-BASED SYSTEM FOR PRE-IMPACT FALL DETECTION
Alessandro Leone, Gabriele Rescio, Andrea Caroppo, Pietro Siciliano
National Research Council of Italy, Italy

14:30 - 15:45
A4L-D: OPTICAL SENSOR SYSTEMS
ROOM 204
SESSION CHAIRS: Anna Mignani (Institute of Applied Physics, IFAC)
Sinead O'Keeffe (University of Limerick)

14:30
INVITED: MINIATURE FOURIER TRANSFORM SPECTROMETERS BASED ON ELECTROTHERMAL MEMS MIRRORS WITH LARGE PISTON SCAN RANGE
Huikai Xie[{1}], S. Lan[{2}], D. Wang[{2}], W. Wang[{1}], J. Sun[{2}], H. Liu[{2}], J. Cheng[{2}], J. Ding[{2}], Z. Qin[{2}], Q. Chen[{2}], H. Kang[{3}], Z. Tian[{3}]
[{1}]University of Florida, USA; [{2}]WiO Technologies Ltd. Co., China; [{3}]Xiamen University, China

15:00
A FIBER FABRY-PEROT INTERFEROMETER FOR GEOPHYSICS APPLICATIONS
Han Cheng Seat[{4}], Michel Cattoen[{4}], Françoise Lizion[{4}], Maha Suleiman[{1}], Frédérick Boudin[{6}], Jean Chéry[{6}], Christophe Brunet[{3}], Pascal Bernard[{3}], Patrick Chawah[{7}], Anthony Sourice[{2}], G. Plantier[{2}], D. Boyer[{5}], A. Cavaillou[{5}], S. Gaffet[{5}]
[{1}]CNRS-INSA-UJF-UPS, France; [{2}]Ecole Supérieure d'Electronique de l'Ouest, France; [{3}]Institut de Physique du Globe de Paris, France; [{4}]LAAS-CNRS et University de Toulouse, France; [{5}]Laboratoire Souterrain à Bas Bruit, France; [{6}]Université Montpellie

15:15
PHOTOACOUSTIC SIGNAL MEASUREMENT USING THIN FILM FABRY-PEROT OPTICAL INTERFEROMETER FOR PHOTOACOUSTIC MICROSCOPY
Soongho Park, Jonghyun Eom, Byeong Ha Lee
Gwangju Institute of Science and Technology, Korea

15:30
AN ULTRA-HIGH SENSITIVITY FABRY-PEROT ACOUSTIC PRESSURE SENSOR USING A MULTILAYER SUSPENDED GRAPHENE DIAPHRAGM
Cheng Li[{1}], Qianwen Liu[{1}], Tingting Guo[{1}], Jun Xiao[{1}], Shangchun Fan[{1}], Wei Jin[{2}]
[{1}]Beihang University, China; [{2}]Hong Kong Polytechnic University, China

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14:30 - 16:00
A4L-E: PHYSICAL BIOSENSORS
ROOM 206
SESSION CHAIRS: Paddy French (Delft University of Technology) Tamina Ajmal (University of Bedfordshire)

14:30
INVITED: BIOMEDICAL APPLICATIONS OF TUNABLE LIQUID LENSES
Hongrui Jiang, Aditi Kanhere
University of Wisconsin-Madison, USA

15:00
A CALORIMETRIC BIOSENSING SYSTEM FOR CLINICAL DIAGNOSTIC APPLICATIONS
David Gaddes, Srinivas Tadigadapa
Pennsylvania State University, USA

15:15
CANTILEVER SENSORS BASED ON SIALYLGLYCOPOLYMER VIRUS RECEPTOR WITH DIFFERENT READOUT SYSTEMS
Petr Gorelkin[{3}], Alexander Erofeev[{3}], Gleb Kiselev[{3}], Dmitry Kolesov[{3}], Alexandra Gambaryan[{3}], Igor Yaminsky[{3}], Jeong Soo Lee[{1}], Chae-Deok Lee[{1}], Gyoung Soo Kim[{1}], Kyu Ho Song[{1}], Jungsun Han[{1}], Eun Hwa Choi[{1}], Keumcheol Kwak[{1}], Irina Borodina
[{1}]LG Electronics Inc. / M&C Advenced Research Institute, Korea; [{2}]LG Electronics Russia R&D Lab, Russia; [{3}]Moscow State University, Russia

15:30
MONITORING YEAST ACTIVATION WITH SUGAR AND ZERO-CALORIE SWEETENER USING TERAHERTZ WAVES
Olutosin Fawole, Kushagra Sinha, Massood Tabib-Azar
University of Utah, USA

15:45
RESONATOR SENSOR ARRAY FOR SYNOVIAL FLUID CHARACTERIZATION
Ali Abdallah[{1}], Erwin Konrad Reichel[{1}], Stefan Clara[{1}], Sabrina Mairhofer[{1}], Bernhard Jakoby[{1}], Christian Feichtenschlager[{2}], Martin Kramer[{2}], Andreas Moritz[{2}]
[{1}]Johannes Kepler Universität Linz, Austria; [{2}]Justus Liebig-Universität Gießen, Germany

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14:30 - 16:00
A4L-F: INERTIAL SENSOR SYSTEMS
ROOM 207
SESSION CHAIRS: Oliver Paul (University of Freiburg)
Tony Jun Huang (Pennsylvania State University)

14:30
A MONOLITHICALLY INTEGRATED MULTI-SENSOR PLATFORM
Niladri Banerjee, Aishwaryadev Banerjee, Nazmul Hasan, Shashank Pandey, Bishnu Gogoi, Carlos H. Mastrangelo
University of Utah, USA

14:45
EFFECTS OF STABILITY ASYMMETRY IN PARAMETRICALLY ACTUATED MEMS SENSORS ON PHASE FLIP PROBABILITY
Lily Li, Kimberly Turner
University of California, Santa Barbara, USA

15:00
±2PPM FREQUENCY DRIFT AND 300X REDUCTION OF BIAS DRIFT OF COMMERCIAL 6-AXIS INERTIAL MEASUREMENT UNITS USING A LOW-POWER OVEN-CONTROL MICRO PLATFORM
Donguk Yang[{3}], Jong-Kwan Woo[{3}], Khalil Najafi[{3}], Sangwoo Lee[{1}], Jay Mitchell[{1}], Dorian Challoner[{2}]
[{1}]ePack, Inc., USA; [{2}]Inertialwave, USA; [{3}]University of Michigan, USA

15:15
DEVELOPMENT OF SAW ACCELERATION SENSOR WITH EXCELLENT TEMPERATURE STABILITY
Wen Wang, Yangqing Huang, Xinlu Liu
Institute of Acoustics, Chinese Academy of Sciences, China

15:30
THE PHASE SENSITIVITY AND RESPONSE TIME OF AN X-BAND DUAL CHANNEL MICROWAVE PHASE DETECTOR
Hao Yan, Xiaoping Liao, Di Hua
Southeast University, China

15:45
A NOVEL HIGH SENSITIVITY MEMS ACOUSTIC GYROSCOPE BY MEASURING PHASE SHIFT
Yuanyuan Yu[{2}], Buyun Chen[{2}], Jin Tao[{2}], Xuejiao Chen[{2}], Hao Zhang[{2}], Wei Pang[{2}], Daihua Zhang[{2}], Hao Luo[{1}]
[{1}]Intel Labs, USA; [{2}]Tianjin University, China

16:00 - 16:30
MONDAY AFTERNOON BREAK
2F LOBBY

16:30 - 17:45
A5L-A: METAL OXIDE GAS SENSORS
ROOM 201
SESSION CHAIRS: Inkyu Park (KAIST)
Phillip Feng (Case Western Reserve University)

16:30
INVITED: OXIDE NANOSTRUCTURES AND 2-DIMENSIONAL MATERIALS FOR CHEMORESISTIVE GAS SENSING
Ho Won Jang
Seoul National University, Korea

17:00
CHEMICAL SENSING VIA SINGLE INPUT - MULTI OUTPUT APPROACH
Corentin Jorel[{2}], Didier Robbes[{2}], Constantin Radu[{1}], Matthieu Denoual[{1}], Julien Grand[{1}], Philippe Bazin[{1}], Svletana Mintova[{1}]
[{1}]École nationale supérieure d'ingénieurs de Caen & Centre de Recherche, France; [{2}]Université de Caen Normandie, France

17:15
DEVELOPMENT OF NEW GAS SENSORS BASED ON OXIDIZED GALINSTAN
Mahnaz Shafiei, Nunzio Motta, Faegheh Hoshyargar, Anthony P. O'Mullane
Queensland University of Technology, Australia

17:30
A MICRO ELECTROCHEMICAL SENSOR BASED ON BISMUTH-MODIFIED MESOPOROUS CARBON FOR HEXAVALENT CHROMIUM DETECTION
Sixing Xu, Xiaohong Wang, Chen Zhou
Tsinghua University, China

16:30 - 18:00
A5L-B: GYROSCOPE & RESONATORS
ROOM 202
SESSION CHAIRS: Tayfun Akin (Middle East Technical University)
Martin Heinisch (Johannes Kepler University)

16:30
MODE ORDERING IN TUNING FORK STRUCTURES WITH NEGATIVE STRUCTURAL COUPLING FOR MITIGATION OF COMMON-MODE G-SENSITIVITY
Brenton R. Simon, Sambuddha Khan, Alexander A. Trusov, Andrei M. Shkel
University of California, Irvine, USA

16:45
TACTICAL GRADE MEMS GYRO WITH LOW ACCELERATION SENSITIVITY
Qin Shi, Anping Qiu, Guoming Xia, Yan Su
Nanjing University of Science and Technology, China

17:00
ALL-DIGITAL MEMS GYRO-SENSOR USING TAD-DIGITAL-SYNCHRONOUS-DETECTION (TAD-DSD) BY TAD-ADPLL
Takamoto Watanabe, Shigenori Yamauchi
Denso Corporation, Japan

17:15
A TEMPERATURE COMPENSATION METHOD FOR MICROMACHINED THERMAL GAS GYROSCOPE
Shi Qiang Liu, Rong Zhu, Heng Gao Ding
Tsinghua University, China

17:30
TRANSDUCTION PERFORMANCE OF PIEZORESISTIVE SILICON NANOWIRES ON THE FREQUENCY RESOLUTION OF A RESONANT MEMS SENSOR
Guillaume Lehée{4}, Frédéric Souchon{2}, Jean-Christophe Riou{1}, Alain Bosseboeuf{3}, Guillaume Jourdan{2}
{1}Safran Corp., France; {2}Université Grenoble Alpes / CEA-LETI, France; {3}Université Paris-Sud, France; {4}Université Paris-Sud / Safran Corp., France

17:45
SENSOR BASED ON THE MODE-LOCALIZATION EFFECT IN ELECTROSTATICALLY-COUPLED MEMS RESONATORS FABRICATED USING AN SOI PROCESS
Graham Stewart Wood[2], Chun Zhao[2], Ibrahim Sari[2], Suan Hui Pu[3], Michael Kraft[1]
[1]Université de Liège, Belgium; [2]University of Southampton, United Kingdom; [3]University of Southampton Malaysia Campus, Malaysia

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16:30 - 18:00
A5L-C: FLUIDIC SYSTEMS
ROOM 203
SESSION CHAIRS: Michael McShane (Texas A&M University)

16:30
DETERMINATION OF GAS SOURCE EXISTENCE IN A SPECIFIED AREA BY ACTIVE AIRFLOW GENERATOR ROBOTS
Takashi Yoshida, Ryuichi Takemura, Haruka Matsukura, Hiroshi Ishida
Tokyo University of Agriculture and Technology, Japan

16:45
RAPID PROTOTYPING OF A FLEXIBLE MICROFLUIDIC SENSING SYSTEM USING INKJET AND SCREEN PRINTING PROCESSES
Binu Baby Narakathu, Sai Guruva Avuthu Reddy, Dinesh Maddipatla, Sepehr Emamian, Ali Eshkeiti, Amer Abdulmahdi Chlaihawi, Bradley Bazuin, Massood Zandi Atashbar
Western Michigan University, USA

17:00
A MICROFLUIDIC PROTOTYPE FOR SCALING-UP MICROBIAL FUEL CELL SYSTEMS
Hankeun Lee, Seokheun Choi
Binghamton University, State University of New York, USA

17:15
ENHANCING ROBUSTNESS AND APPLICABILITY OF CONTACTLESS INDUCTIVE FLOW TOMOGRAPHY
Matthias Ratajczak, Thomas Wondrak, Till Zürner, Frank Stefani
Helmholtz-Zentrum Dresden-Rossendorf, Germany

17:30
FLOW SENSOR FOR FIELD MEASUREMENT OF VISCOUS LIQUID USAGE FOR CONSUMER STUDIES
Christian Hatzfeld[2], Christian Schröder[1], Alexander Unger[2], Olivia Morar[1], Torsten Klemm[1], Mario Kupnik[2], Roland Werthschützky[2]
[1]Procter & Gamble Co., Germany; [2]Technische Universität Darmstadt, Germany

17:45
ACOUSTIC SENSOR FOR IN-LINE MONITORING IN POLYMER EXTRUSION DIES
Ali Abdallah[2], Stefan Clara[2], Erwin Konrad Reichel[2], Gert Brabants[3], Bernhard Jakoby[2], Thomas Voglhuber-Brunnmaier[1], Hans-Jürgen Luger[2], Ivana Burzic[2], Alexander Lepschi[2], Jürgen Miethlinger[2], Veronika Putz[4]
[1]Danube University Krems, Austria; [2]Johannes Kepler Universität Linz, Austria; [3]Johannes Kepler Universität Linz & Katholieke Universiteit Leuven, Austria; [4]Linz Center of Mechatronics GmbH, Austria

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16:30 - 18:00
A5L-D: IMAGING SENSORS
ROOM 204
SESSION CHAIRS: Rihito Kuroda (Tohoku University)
Payman Zarkesh-Ha (University of New Mexico)

16:30
INVITED: PHYSICAL LIMITS OF THERMAL INFRARED SENSING
Joseph Talghader
University of Minnesota, USA

17:00
A NOVEL NEAR-FIELD TERAHERTZ IMAGING PROBE FOR BIOLOGICAL IMAGING
Olutosin Fawole, Massood Tabib-Azar
University of Utah, USA

17:15
OPTICAL SENSOR SYSTEM FOR THE DETECTION OF MOLD
Roland Blank, P. P. Vinayaka, M. W. Tahir, Michael J. Vellekoop, Walter Lang
Universität Bremen, Germany

17:30
ENHANCEMENT OF ENDOSCOPIC FLUORESCENCE IMAGING BY SUPER-RESOLUTION MICROLENS
Feifei Wang[2], Yangdong Wen[2], Lianqing Liu[2], Haibo Yu[2], Peng Yu[2], Yuechao Wang[2], Wen Jung Li[1]
[1]City University of Hong Kong, Hong Kong; [2]Shenyang Institute of Automation, Chinese Academy of Sciences, China

17:45
DESIGN AND DEVELOPMENT OF A TEST SYSTEM FOR CHARACTERIZATION OF PIXEL CROSSTALK IN CMOS IMAGE SENSORS
Mahmoud Joz Tavassoli[{2}], Marzieh Asadeh Parchami[{3}], Uwe Apel[{3}], Mehdi Safarpour[{4}], Uli Lemmer[{1}]
[{1}]Karlsruher Institut für Technologie, Germany; [{2}]Karlsruher Institut für Technologie / Robert BOSCH GmbH, Germany; [{3}]Robert Bosch GmbH, Germany; [{4}]University of Zanjan, Iran

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16:30 - 18:00
A5L-E: CELL-BASED BIOSENSORS
ROOM 206
SESSION CHAIRS: Marina Cole (University of Warwick)
Yuji Murakami (Toyohashi University of Technology)

16:30
INVITED: PALMTOP SENSOR FOR DETECTION OF VIRUSES BASED ON OPTICAL WAVEGUIDE MODE
Koichi Awazu
National Institute of Advanced Industrial Science and Technology, Japan

17:00
INVITED: MICROFABRICATED OPTOELECTRONIC NEURAL IMPLANTS FOR OPTOGENETICS
Wen Li[{1}], Bin Fan[{1}], Ki Yong Kwon[{2}], Arthur Weber[{1}]
[{1}]Michigan State University, USA; [{2}]Plexon Inc., USA

17:30
UPSIDE-DOWN CARBON NANOTUBE (CNT) MICRO-ELECTRODE ARRAY (MEA)
Nikolas Gaio[{2}], Berend van Meer[{1}], Cinzia Silvestri[{2}], Saeed Khoshfetrat Pakazad[{2}], Sten Vollebregt[{2}], Christine L. Mummery[{1}], Ronald Dekker[{2}]
[{1}]Leiden University Medical Centre, Netherlands; [{2}]Technische Universiteit Delft, Netherlands

17:45
A CELL-BASED ODOR SENSING SYSTEM USING FLUORESCENT TECHNIQUE AND LOCK-IN MEASUREMENT ROBUST AGAINST DISTURBANCE
Totok Mujiono[{1}], Yuji Sukekawa[{1}], Takamichi Nakamoto[{1}], Hidefumi Mitsuno[{3}], Ryohei Kanzaki[{3}], Nobuo Misawa[{2}]
[{1}]Tokyo Institute of Technology, Japan; [{2}]Toyohashi University of Technology, Japan; [{3}]University of Tokyo, Japan

16:30 - 17:45
A5L-F: MULTI-SENSOR AND SENSOR-NETWORK SYSTEMS
ROOM 207
SESSION CHAIRS: Walter Lang (University of Bremen)
Martin Heinisch (Johannes Kepler University)

16:30
BASIC STUDY FOR TACTILE AND VISUAL TEXTURE MEASUREMENT BY MULTIMODAL MEMS SENSOR WITH FORCE AND LIGHT SENSITIVITY
Kenta Takahashi[1], Takashi Abe[1], Masayuki Sohgawa[1], Masanori Okuyama[2], Haruo Noma[3]
[1]Niigata University, Japan; [2]Osaka University, Japan; [3]Ritsumeikan University, Japan

16:45
WIRELESS SENSORS FOR AUTOMATED CONTROL OF TOTAL INCOMBUSTIBLE CONTENT (TIC) OF DUST DEPOSITED IN UNDERGROUND COAL MINES
Omid Mahdavipour[5], Timothy Mueller-Sim[5], Dorsa Fahimi[4], Skot Croshere[3], Pit Pillatsch[3], Jusuf Merukh[3], Valentino Zegna Baruffa[4], John Sabino[4], Koji Tran[4], Giovanni Alanis[4], Paul Solomon[2], Paul Wright[3], Richard White[3], Lara Gundel
[1]Lawrence Berkeley National Laboratory, USA; [2]U.S. Environmental Protection Agency, USA; [3]University of California, Berkeley , USA; [4]University of Illinois, USA; [5]University of Illinois at Chicago, United

17:00
WIRELESS SENSOR NETWORK BASED FLOOD/DROUGHT FORECASTING SYSTEM
Feeza Khan, Saira Memon, Imran Jokhio, Sana Jokhio
Mehran University of Engineering and Technology, Pakistan

17:15
WEARABLE DRIVER DROWSINESS DETECTION SYSTEM BASED ON BIOMEDICAL AND MOTION SENSORS
Boon-Leng Lee[2], Boon-Giin Lee[1], Wan-Young Chung[3]
[1]Keimyung University, Korea; [2]Pukyong Naional University, Korea; [3]Pukyong National University, Korea

17:30
WIRELESS LOW-POWER TEMPERATURE PROBES FOR FOOD/PHARMACEUTICAL PROCESS MONITORING
Nithin Raghunathan, Xiaofan Jiang, Dimitrios Peroulis, Arnab Ganguly
Purdue University, USA

18:00 - 19:00
YOUNG PROFESSIONALS RECEPTION
ROOM 211-21

TUESDAY, NOVEMBER 3

08:00 - 08:30
TUESDAY LECTURE AUTHOR BREAKFAST
ROOM 211-212

08:30 -09:30
KEYNOTE: Mechanical Systems in the Quantum Limit
Andrew Cleland
University of Chicago, USA
GRAND BALLROOM

09:30 - 10:00
TUESDAY MORNING BREAK
2F LOBBY

10:00 - 11:15
B2L-A: ADVANCED MATERIALS OR ARCHITECTURES FOR CHEMICAL SENSING
ROOM 201
SESSION CHAIRS: John Atkinson (University of Southampton) Sangmin Jeon (POSTECH Pohang University of Science and Technology)

10:00
NOVEL POLYMER MATERIALS FOR LOW-COST NITRO VAPOR DETECTION SENSORS
Robert Blue, Deepak Uttamchandani, Neil Thomson, Peter Skabara
University of Strathclyde, United Kingdom

10:15
SELECTIVE HYDROGEN SENSING BY COBALT DOPED ZNO THIN FILMS: A STUDY ON CARRIER REVERSAL CONDUCTIVITY
Abhishek Ghosh[{1}], Rittick Bannerjee[{2}], Subhasish Basu Majumder[{1}]
[{1}]Indian Institute of Technology Kharagpur, India; [{2}]Siksha 'O' Anusandhan University, India

10:30
HIGHLY SENSITIVE, GRAPHENE OXIDE SUPPORTED ZINC STANNATE (ZN2SNO4) NANOCUBES AND THEIR ROOM TEMPERATURE NO2 GAS SENSOR PROPERTIES
Dinesh Veeran Ponnuvelu, Biji Pullithadathil
PSG Institute of Advanced Studies, India

10:45

THE INVESTIGATION OF REDUCED GRAPHENE OXIDE/TITANIUM DIOXIDE-BASED SENSOR FOR FORMALDEHYDE DETECTION AT ROOM TEMPERATURE

Zongbiao Ye, Huiling Tai, Chunhua Liu, Zhen Yuan, Tao Xie, Yuanjie Su, Yadong Jiang
University of Electronic Science and Technology of China, China

11:00

A NOVEL LOW-COST PRE-CONCENTRATOR CONCEPT TO BOOST SENSITIVITY AND SELECTIVITY OF GAS SENSOR SYSTEMS

Andreas Schütze{3}, Martin Leidinger{3}, Bastian Schmitt{3}, Tilman Sauerwald{3}, Max Rieger{1}, Christine Alépée{2}
{1}Fraunhofer Institute for Chemical Technology, Germany; {2}SGX Sensortech SA, Switzerland; {3}Universität des Saarlandes, Germany

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10:00 - 11:30

B2L-B: ULTRASONIC, ACOUSTIC, MAGNETIC SENSORS

ROOM 202

SESSION CHAIRS: David Horsley (University of California, Davis) Venkat Bhethanabotla (University of South Florida)

10:00

A CUSTOM REAL-TIME ULTRASONIC INSTRUMENT FOR SIMULTANEOUS MIXTURE AND FLOW ANALYSIS OF BINARY GASES IN THE CERN ATLAS EXPERIMENT

Cecilia Rossi{6}, M. Alhroob{10}, R. Bates{9}, M. Battistin{6}, S. Berry{6}, A. Bitadze{9}, P. Bonneau{6}, G. Boyd{10}, O. Crespo-Lopez{6}, C. Deterre{5}, B. DiGirolamo{6}, M. Doubek{4}, J. Godlewski{6}, G. Hallewell{3}, A. Hasib{10}, S. Katunin{1}, S. Mc
{1}B.P. Konstantinov Petersburg Nuclear Physics Institute, Russia; {2}Cavendish Laboratory, United Kingdom; {3}Centre de Physique des Particules de Marseille, France; {4}Czech Technical University, Czech Rep.; {5}Deutsches Elektronen-Synchrotron, Germany;

10:15

DEVELOPMENT OF A BIOMIMETIC EARDRUM FOR ACOUSTIC SENSING

Pieter Westerik, Erwin Berenschot, Gijs Krijnen
Universiteit Twente, Netherlands

10:30
INVESTIGATIONS OF PMN-PT COMPOSITES FOR HIGH SENSITIVE ULTRASONIC PHASED ARRAY PROBES IN NDE
Susan Walter[2], Thomas Herzog[2], Frank Schubert[2], Henning Heuer[2], Tae-Young Han[2], Sang-Goo Lee[3], Hee Man Chae[1], Cheeyoung Joh[1], Hee-Seon Seo[1]
[1]Agency for Defense Development, Korea; [2]Fraunhofer Institute for Ceramic Technologies and Systems, Germany; [3]IBULE Photonics, Korea

10:45
OPTIMAL GEOMETRY OF CMOS VOLTAGE-MODE AND CURRENT-MODE VERTICAL MAGNETIC HALL SENSORS
Hadi Heidari[2], Edoardo Bonizzoni[1], Umberto Gatti[1], Franco Maloberti[1], Ravinder Dahiya[2]
[1]Università degli Studi di Pavia, Italy; [2]University of Glasgow, United Kingdom

11:00
A NONINVASIVE AC CURRENT SENSOR WITH PERMANENT-MAGNET BIASED PZT CANTILEVER
Jing'Ao Huang, Xiaoming Wu, Xiaohong Wang
Tsinghua University, China

11:15
A MAGNETIC SENSOR TO MEASURE WEAR IN CENTRIFUGAL PUMPS
Ramin Khoie, Bhushan Gopaluni, James Olson, Boris Stoeber
University of British Columbia, Canada

10:00 - 11:30
B2L-C: FORCE AND PRESSURE BASED SENSING APPLICATIONS
ROOM 203
SESSION CHAIRS: Michael Lu (National Tsing Hua University)
Matteo Rinaldi (Northeastern University)

10:00
INVITED: MICROFABRICATED MAGNETOELASTIC SENSORS AND ACTUATORS
Scott Green, Yogesh Gianchandani
University of Michigan, USA

10:30
UPPER LIMB PROSTHETIC CONTROL USING TOE GESTURE SENSORS
William Taube Navaraj, Hadi Heidari, Anton Polishchuk, Dhayalan Shakthivel, Dinesh Bhatia, Ravinder Dahiya
University of Glasgow, United Kingdom

10:45
A TWO-DIMENSIONAL DISTRIBUTED-DEFLECTION SENSOR FOR CONTACT LOCALIZATION
Yichao Yang, Zhili Hao
Old Dominion University, USA

11:00
PRINTED CAPACITIVE TOUCH SENSORS EMBEDDED IN ORGANIC COATINGS ON SHEET STEEL
Johannes Sell[{1}], Herbert Enser[{1}], Bernhard Jakoby[{1}], Wolfgang Hilber[{1}], Michaela Schatzl-Linder[{2}], Bernhard Strauß[{2}]
[{1}]Johannes Kepler Universität Linz, Austria; [{2}]voestalpine Stahl GmbH, Austria

11:15
A PRESSURE / TEMPERATURE SENSOR EMBEDDED IN AN ENDOSCOPY HOOD FOR INTRALUMINAL MONITORING DURING FLEXIBLE ENDOSCOPIC OPERATION
Yusaku Maeda, Yusaku Maeda, Hideki Kobara, Hirohito Mori, Hidekuni Takao
Kagawa University, Japan

10:00 - 11:15
B2L-D: OPTICAL SENSING
ROOM 204
SESSION CHAIRS: Ignacio Matias (Public University of Navarra)
Krikor B. Ozanyan (University of Manchester)

10:00
HYDROGEN PEROXIDE PLASMONIC SENSING BASED ON AG-AU TRIANGULAR NANOFRAMES
Yiting Wu, Ting Feng, Junwei Di
Soochow University, China

10:15
MINIATURE SELF-CALIBRATED FIBER OPTIC TIP TEMPERATURE AND PRESSURE SENSOR
Zhipeng Tian, Anthony Nelson, Sadia Afroz, Vaishnavi Srinivasaraghavan, Muhammad Akbar, Zhao Li, Anbo Wang, Masoud Agah
Virginia Polytechnic Institute and State University, USA

10:30
FLAT PANEL FINGERPRINT OPTICAL SENSOR USING TFT TECHNOLOGY
Yi-Huan Liao, Chun Chang, Chih-Hao Lin, Jhen-Yu You, Hao-Lun Hsieh, Jing-Wen Chen, An-Thung Cho, Yu-Rong Liu, Ying-Hui Lai, Jen-Pei Tseng, Min-Feng Chiang, Yu-Chieh Lin
AU Optronics Corporation, Taiwan

10:45

ROBUST FRINGE DETECTION BASED ON BI-WAVELET TRANSFORM FOR SELF-MIXING DISPLACEMENT SENSOR

Olivier Daniel Bernal[2], Han Cheng Seat[2], Usman Zabit[3], Frédéric Surre[1], Thierry Bosch[2]

[1]City University London, United Kingdom; [2]LAAS-CNRS et University de Toulouse, France; [3]Riphah University, Pakistan

11:00

MULTIMODE SEMICONDUCTOR LASERS FOR ADAPTIVE SELF-MIXING SENSORS

Frederic Surre[1], Thanh Binh Pham[2], Han Cheng Seat[2], Olivier Daniel Bernal[2]

[1]City University London, United Kingdom; [2]LAAS-CNRS et University de Toulouse, France

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10:00 - 11:15

B2L-E: ELECTROCHEMICAL BIOSENSORS

ROOM 206

SESSION CHAIRS: Adeel Afzal (King Fahd University of Petroleum and Minerals)

Mohamed Abdelmoneum (Intel Corporation)

10:00

A MICROFABRICATED LOW-COST AU NANOTIP PYRAMIDAL ELECTRODE ARRAY USING ANISOTROPIC ETCHING FOR ENHANCED PERFORMANCE OF A GLUCOSE BIOSENSOR

Gymama Slaughter, Deepa Gupta, Tanmay A. Kulkarni, Larry Morton Jr.

University of Maryland Baltimore County, USA

10:15

A SIMPLE AND HIGHLY SENSITIVE ELECTROCHEMICAL PLATFORM FOR DETECTION OF MICRORNAS

Pawan Jolly, Lai Chun Caleb Wong, Anna Miodek, Mark Lindsay, Pedro Estrela

University of Bath, United Kingdom

10:30

HIGH ROFF/RON RATIO LIQUID BASED MEMRISTOR SENSOR USING SOL GEL SPIN COATING TECHNIQUE

Nor Shahanim Mohamad Hadis[1], Asrulnizam Abd Manaf[1], Sukreen Hana Herman[2], Siti Hawa Ngalim[1]

[1]Universiti Sains Malaysia, Malaysia; [2]Universiti Teknologi MARA, Malaysia

10:45
A HIGHLY USABLE AND CUSTOMIZABLE SEMG SENSOR FOR PROSTHETIC LIMB CONTROL USING POLYPYRROLE-COATED NONWOVEN FABRIC SHEET
Yinlai Jiang[{2}], Shintaro Sakoda[{2}], Masami Togane[{2}], Soichiro Morishita[{2}], Baoliang Lu[{1}], Hiroshi Yokoi[{2}]
[{1}]Shanghai Jiao Tong University, China; [{2}]University of Electro-Communications, Japan

11:00
THREE-DIMENSIONAL GRAPHENE-POLYDIMETHYLSILOXANE COMPOSITE AS A CONDUCTIVE SUBSTRATE FOR CELL-BASED ELECTROCHEMICAL DETECTION
Uraiwan Waiwijit, Tanom Lomas, Adisorn Tuantranont, Thitima Maturos, Ditsayut Phokaratkul, Anurat Wisitsoraat
National Electronics and Computer Technology Center, Thailand

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10:00 - 11:30
B2L-F: SENSORS READOUT/INTERFACE/CIRCUITS I
ROOM 207
SESSION CHAIRS: Alton Horsfall (Newcastle University)
Phillip Feng (Case Western Reserve University)

10:00
A FULLY INTEGRATED CMOS INTERFACE ASIC FOR TWO-AXIS PIEZOELECTRIC ANGULAR RATE MEMS INERTIAL SENSORS
Sultan A. Alqarni, Abdulfattah M. Obeid, Mohammed S. BenSaleh, Syed Manzoor Qasim
King Abdulaziz City for Science and Technology, Saudi Arabia

10:15
CALCULATING DEPTH IMAGE WITH PIXEL-PARALLEL PROCESSOR FOR A TOF IMAGE SENSING SYSTEM
Zhe Chen, Liyuan Liu, Nanjian Wu
Institute of Semiconductors, Chinese Academy of Sciences, China

10:30
A NEW ADAPTIVE FRONT-END CIRCUIT FOR HIGH-RESOLUTION MAGNETIC SCALES
Ping-Chieh Chien, Yung-Hua Kao, Hong-Yang Chen, Jing-Hao Huang, Paul C. -P. Chao, Chin-Long Wey
National Chiao Tung University, Taiwan

10:45
A SMART SENSORY PLATFORM BASED ON FIELD PROGRAMMABLE ANALOG ARRAY
Tao Yin, Xiaoyan Cheng, Fubin Xin, Qisong Wu, Fei Wang, Haigang Yang
Institute of Electronics, Chinese Academy of Sciences, China

11:00
MEASUREMENT UNCERTAINTY OF TIME-BASED AND VOLTAGE-BASED WHEATSTONE BRIDGE READOUT CIRCUITS
Jan Lotichius, Stefan Wagner, Mario Kupnik, Roland Werthschützky
Technische Universität Darmstadt, Germany

11:15
A LOW-POWER READOUT CIRCUIT DESIGN FOR CAPACITIVE MICROSENSORS
Fatemeh Aezinia, Behraad Bahreyni
Simon Fraser University, Canada

11:30 - 12:30
TUESDAY LUNCH & AWARDS
GRAND BALLROOM

12:30 - 14:00
B3P-G: SENSOR MODELING & CHARACTERIZATION II
ROOMS 101-110
SESSION CHAIR: Tania Mukherjee (Indian Institute of Technology Kharagpur)

1-2
MATHEMATICAL MODEL FOR BIOMOLECULAR QUANTIFICATION USING SURFACE-ENHANCED RAMAN SPECTROSCOPY BASED SIGNAL INTENSITY DISTRIBUTIONS
Mirko Palla[{2}], Filippo Giacomo Bosco[{3}], Jaeyoung Yang[{1}], Tomas Rindzevicius[{3}], Tommy Sonne Alstrom[{3}], Michael Stenbæk Schmidt[{3}], Qiao Lin[{1}], Jingyue Ju[{1}], Anja Boisen[{3}]
[{1}]Columbia University, USA; [{2}]Harvard University, USA; [{3}]Technical University of Denmark, Denmark

1-5
TOWARDS PROPER ACCELERATION ESTIMATE BY USING SPECTRAL ACCELERATION INFORMATION. APPLICATION TO TRAIN TRANSPORTATION
Damien Veillard, Frederick Mailly, Philippe Fraisse
Université de Montpellier / CNRS, France

1-8
ACOUSTIC STREAMING DRIVEN BY IMMERSED RESONATOR STRUCTURES
Erwin Konrad Reichel, Bernhard Jakoby
Johannes Kepler Universität Linz, Austria

1-11
MICROCAVITY ASSISTED ACOUSTIC WAVE CHANNELING CAN LEAD TO HIGH SENSITIVITY AND ULTRA-LOW POWER SAW SENSORS
Sina Koochakzadeh[{2}], Mandek Richardson[{2}], Venkat Bhethanabotla[{2}], Subramanian Sankaranarayanan[{1}]
[{1}]Argonne National Laboratory, USA; [{2}]University of South Florida, USA

1-14
BEHAVIORAL MODELING AND EXPERIMENTAL VALIDATION OF UNCOOLED MICROBOLOMETER
Gyungtae Kim, Hyoungho Ko
Chungnam National University, Korea

1-17
ONE COMPUTER-AIDED EQUIVALENT CIRCUIT MODEL OF A MEMS PHASE DETECTOR APPLIED IN PHASE LOCKED LOOPS
Juzheng Han, Xiaoping Liao
Southeast University, China

1-20
ADAPTIVE SENSOR FUSION TECHNOLOGY FOR MOBILE AND WEARABLE APPLICATIONS
Ramasamy Kannan{1}, Ankur Garg{2}
{1}Samsung Electronics, Korea; {2}Samsung R&D Institute India Bangalore, India

1-22
MODAL COUPLING ERROR SUPPRESSION IN MICROMACHINED GYROSCOPES BY UV LASER TRIMMING
Zhanqiang Hou, Xuezhong Wu, Dingbang Xiao, Xinghua Wang, Zhihua Chen
National University of Defense Technology, China

13-249
A NOVEL FEATURE EXTRACTION ALGORITHM FOR ON THE SENSOR NODE PROCESSING OF COMPRESSIVE SAMPLED PHOTOPLETHYSMOGRAPHY SIGNALS
Venkata Rajesh Pamula{2}, Marian Verhelst{3}, Chris Van Hoof{2}, Refet Fira Yazicioglu{1}
{1}imec, Belgium; {2}imec/Katholieke Universiteit Leuven, Belgium; {3}Katholieke Universiteit Leuven, Belgium

13-252
IMPROVED PATH LOSS PREDICTION MODEL FOR SHORT RANGE INDOOR POSITIONING USING BLUETOOTH LOW ENERGY
Subha Viswanathan, Sreedevi Srinivasan
Cisco Systems Pvt Ltd, India

12:30 - 14:00
B3P-H: CHEMICALS SENSORS
ROOMS 101-110
SESSION CHAIR: Binu Narakathu (Western Michigan University)

2-24
DETECTION OF VOLATILE ORGANIC SULFUR COMPOUNDS (VOSCS) BY SAW SENSOR BASED ON HYDROGEN-BOND ACIDIC POLYMERS
Yin Long, Xiaosong Du, Yang Wang, Luhua Cheng, Penglin Wu, Yuanjie Su, Yadong Jiang
University of Electronic Science and Technology of China, China

2-27

OPTICAL GAS SENSOR BASED ON LSPR USING ZNO NANOPARTICLES AND AAO NANOSTRUCTURE

Sae-Wan Kim, Seung-Hwan Cha, Byoung-Ho Kang, Sang-Won Lee, Jae-Sung Lee, Ju-Seong Kim, Sai-Anand Gopalan, Shon-Won Kang
Kyungpook National University, Korea

2-30

ENHANCEMENT HUMIDITY SENSING PROPERTIES OF GRAPHENE OXIDE/POLY(ETHYLENEIMINE) FILM QCM SENSORS

Zhen Yuan, Huiling Tai, Xiaohua Bao, Zongbiao Ye, Chunhua Liu, Yadong Jiang
University of Electronic Science and Technology of China, China

2-33

ALIGNMENT-LESS MICROCHANNEL INTEGRATION ONTO A STACKED CARBON ELECTRODE SET FOR HIGHLY SENSITIVE ELECTROCHEMICAL SENSOR APPLICATIONS

Jongmin Lee, Yeongjin Lim, Heungjoo Shin
Ulsan National Institute of Science and Technology, Korea

2-36

THE EFFECT OF ELECTROLYTE CONCENTRATION ON THE CHARACTERISTICS OF MEMS BASED ELECTROCHEMICAL SEISMIC SENSORS

Guanglei Li, Junbo Wang, Deyong Chen, Yonghao Xing, Jian Chen
Institute of Electronics, Chinese Academy of Sciences, China

2-39

INK-JET PRINTED FLEXIBLE GAS SENSORS BASED ON ELECTROMAGNETIC TRANSDUCTION AND CARBON MATERIALS

Prince Bahoumina{2}, Hamida Hallil{2}, Jean-Luc Lachaud{2}, Corinne Dejous{2}, Dominique Rebière{2}, Carlos Paragua{3}, Kamel Frigui{3}, Stéphane Bila{3}, Dominique Baillargeat{3}, Sébastien Pacchini{1}, Philippe Coquet{1}, E. Pichonat{4}, H. Happy{4}
{1}Nanyang Technological University, Singapore; {2}Université de Bordeaux, France; {3}Université de Limoges / CNRS / XLIM Research Institute, France; {4}Université Lille 1, France

2-41

A HIGHLY SELECTIVE MEMS TRANSDUCER FOR HYDROGEN SENSING BASED ON STRESS MODIFICATION IN PALLADIUM THIN FILMS

Thomas Walewyns{2}, Carl Emmerechts{1}, Pierre Gérard{2}, Nicolas André{2}, Laurent A. Francis{2}
{1}Sirris, Belgium; {2}Université catholique de Louvain, Belgium

2-43
THE ELECTROCHEMICAL SENSOR BASED ON CTS@FE3O4 NANOCOMPOSITE FOR THE DETECTION OF TRICHLOROACETIC ACID
Yuanhong Wang[{2}], Yifeng Tu[{2}], Haiying Gu[{1}]
[{1}]Nantong University, China; [{2}]Soochow University, China

2-47
INVESTIGATION OF ZINC PHTHALOCYANINE FILMS FOR QCM SENSING APPLICATIONS
Amani Hamid, Alan Holloway, Aseel Hassan, Alexei Nabok
Sheffield Hallam University, United Kingdom

2-53
THE GAS MULTISENSOR CHIP FABRICATED BY DIRECT ELECTROCHEMICAL DEPOSITION OF TIN OXIDE
Fedor Fedorov[{3}], Dmitry Podgainov[{3}], Alexey Varezhnikov[{3}], Andrey Lashkov[{3}], Vyacheslav Dykin[{3}], Maria Eugenia Toimil-Molares[{1}], Victor Sysoev[{2}]
[{1}]GSI Helmholtzzentrum für Schwerionenforschung, Germany; [{2}]Saratov State Technical University, Russia; [{3}]Yuri Gagarin State Technical University of Saratov, Russia

13-255
SELECTIVE QUANTIFICATION OF HUMIDITY AND AMMONIA BY OPTICAL EXCITATION OF MOLECULAR SEMICONDUCTOR-DOPED INSULATOR (MSDI) SENSORS
Marco Schüler[{1}], Tilman Sauerwald[{1}], Andreas Schütze[{1}], Pierre Gaudillat[{2}], Jean-Moise Suisse[{2}], Marcel Bouvet[{2}]
[{1}]Universität des Saarlandes, Germany; [{2}]Université de Bourgogne Franche-Comté, France

13-258
NICKEL OXIDE THIN FILM SENSOR FOR FLUCTUATION-ENHANCED GAS SENSING OF FORMALDEHYDE
Umut Cindemir[{2}], Lars Österlund[{2}], Gunnar Niklasson[{2}], Claes-Göran Granqvist[{2}], Maciej Trawka[{1}], Janusz Smulko[{1}]
[{1}]Gdansk University of Technology, Poland; [{2}]Uppsala University, Sweden

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12:30 - 14:00
B3P-J: BIOSENSORS II
ROOMS 101-110
SESSION CHAIR: Achi Fethi

3-56
DESIGN AND FABRICATION OF A MEMS MAGNETIC SENSOR UTILIZING FERROMAGNETIC-PIEZOELECTRIC COMPOSITES
Peng Qu, Hongwei Qu, Sreenivasulu Gollapudi, Rao Bidthanapally, Gopalan Srinivasan
Oakland University, USA

3-59
ULTRA-SENSITIVE AND LABEL-FREE BIOSENSORS USING SURFACE PLASMON RESONANCE OF NANO-GRATING STRUCTURE IN NANOFLUIDIC PRECONCENTRATOR
Wei-Hang Lee[2], Pei-Shan Chung[2], Meng-Lin You[1], Kuang-Li Lee[1], Pei-Kuen Wei[1], Wei-Cheng Tian[2]
[1]Academia Sinica, Taiwan; [2]National Taiwan University, Taiwan

3-62
HYDROGEL MATRIX EFFECTS ON OXYGEN DIFFUSION: CONTROLLING PROPERTIES FOR BIOSENSOR APPLICATIONS
Rachel Unruh, Jenna Weaver, Mike McShane
Texas A&M University, USA

3-65
A STRETCHABLE AND WEARABLE PRINTED SENSOR FOR HUMAN BODY MOTION MONITORING
Ali Eshkeiti, Zeinab Ramshani, Sepehr Emamian, Binu Baby Narakathu, Sai Guruva Reddy Avuthu, Mohamed Mohammed Ali, Amer Abdulmahdi Chlaihawi, Margaret Joyce, Massood Zandi Atashbar
Western Michigan University, USA

3-68
NON-ENZYMATIC GRAPHENE-BASED BIOSENSORS FOR CONTINOUS GLUCOSE MONITORING
Mahmoud Sakr, Mohamed Serry
American University in Cairo, Egypt

3-71
ELECTRICAL CHARACTERIZATION OF NANOSTRUCTURED 3D MICROELECTRODES FOR RETINAL NEURON STIMULATION
Kilhwa Pi, Jong Yoon Shin, Suk Won Jung, Sangmin Lee, Dong-Il Cho
Seoul National University, Korea

3-74
THERMAL MEASUREMENT OF CEREBROSPINAL FLUID FLOW RATE IN HYDROCEPHALUS SHUNT
Sathish Rajasekaran[1], Hongwei Qu[1], Karol Zakalik[2]
[1]Oakland University, USA; [2]William Beaumont Hospitals, USA

3-77
DROPLET DNA BINDING DETECTION ON MICROFLUIDIC FLOW-FOCUSING
Sunggu Kim, Junghoon Lee
Seoul National University, Korea

3-80
DEVELOPMENT OF AMPEROMETRIC ION SENSOR ARRAY FOR MULTI-ION DETECTION
Shinya Mizutani, Sou Takahashi, Akiteru Kono, Toshiaki Hattori, Tatsuya Iwata, Makoto Ishida, Kazuaki Sawada
Toyohashi University of Technology, Japan

3-83
HIGHLY SENSITIVE SAM MODIFIED ELECTROSPUN ZINC OXIDE NANOFIBER BASED LABEL FREE BIOSENSING PLATFORM
Brince Paul, M Durga Prakash, Shiv Govind Singh, Siva Rama Krishna Vanjari
Indian Institute of Technology Hyderabad, India

3-85
DETECTION OF L-HISTIDINE USING SOLUTION-PROCESSED ZNO NANOPILLAR
Milan Sasmal, Tapas Kumar Maiti, Tarun Kanti Bhattacharyya
Indian Institute of Technology Kharagpur, India

12:30 - 14:00
B3P-K: OPTICAL SENSORS II
ROOMS 101-110
SESSION CHAIR: Rihito Kuroda (Tohoku University)

4-87
FREQUENCY CHARACTERISATION OF AN OPTICALLY-INTERROGATED ROGOWSKI COIL FOR SMART GRID PROTECTION APPLICATIONS
Grzegorz Fusiek[{2}], John Nelson[{2}], Philip Orr[{1}], Pawel Niewczas[{2}], Campbell Booth[{2}]
[{1}]Synaptec Ltd, United Kingdom; [{2}]University of Strathclyde, United Kingdom

4-90
D-SHAPE OPTICAL FIBER PH SENSOR BASED ON LOSSY MODE RESONANCES (LMRS)
Pablo Zubiate, Carlos Ruiz Zamarreño, Ignacio Del Villar, Ignacio R. Matías-Maestro, Francisco Javier Arregui
Universidad Pública de Navarra, Spain

4-93
EXTRINSIC OPTICAL FIBRE BENDING SENSOR FOR SPINE MONITORING
Mohd Anwar Zawawi, Sinead O'Keeffe, Elfed Lewis, Kieran O'Sullivan
University of Limerick, Ireland

4-96
LENS-FREE AUTOMATED CELL DETECTION SYSTEM FOR TELEMEDICINE APPLICATION
Mohendra Roy[3], Dongmin Seo[3], Yongha Hwang[3], Jaewoo Kim[3], Kiyoung Ann[3], Yeon Hwa Kwak[1], Sungkyu Seo[3], Sangwoo Oh[2], Moonjin Lee[2]
[1]Korea Electronics Technology Institute, Korea; [2]Korea Research Institute of Ships and Ocean Engineering, Korea; [3]Korea University, Korea

4-99
DYNAMIC POSITIONING SENSING SYSTEM FOR ESTIMATING SIZE AND DEPTH OF EMBEDDED OBJECTS
Firdous Saleheen, Chang-Hee Won
Temple University, USA

4-102
A FIBER-OPTIC PH SENSOR WITH WIRELESS RADIO OVER FIBER READ-OUT
Tobias Schuster, Niels Neumann, Dirk Plettemeier, Rene Körbitz, Andreas Richter
Technische Universität Dresden, Germany

12:30 - 14:00
B3P-L: MECHANICAL, MAGNETIC & PHYSICAL SENSORS II
ROOMS 101-110
SESSION CHAIR: Alton Horsfall (Newcastle University)

5-156
CURRENT SOURCE DEDICATED FOR DIRECT DIGITAL SYNTHESIZERS: APPLICATION TO THE GIANT MAGNETO-IMPEDANCE (GMI) SENSORS
Aktham Asfour, Jean-Paul Yonnet, Manel Zidi, Julie Nabias, Papa Silly Traore
Université Grenoble Alpes, France

5-106
TUNABLE EDDY CURRENT DEVICE FOR THE CONTACTLESS CHARACTERIZATION OF A LARGE VARIETY OF SEMICONDUCTOR MATERIALS
Florent Loete, Yann Le Bihan, Josué Ferreira, Denis Mencaraglia
École Supérieure d'Électricité, France

5-110
A TEMPERATURE SELF-CALIBRATING TORSIONAL ACCELEROMETER WITH FULLY DIFFERENTIAL CONFIGURATION AND INTEGRATED REFERENCE CAPACITOR
Dingbang Xiao, Dewei Xia, Qingsong Li, Yulie Wu, Zhihua Chen, Xuezhong Wu
National University of Defense Technology, China

5-114
MEMS FLOW SENSORS WITH SILICON-CARBIDE EROSION RESISTANT COATING
Duy Son Nguyen[{1}], Pit Pillatsch[{1}], Igor Paprotny[{2}], Paul Wright[{1}], Richard White[{1}]
[{1}]University of California, Berkeley, USA; [{2}]University of Illinois at Chicago, USA

5-118
FABRICATION OF A HIGH SENSITIVITY MEMS ACCELEROMETER WITH SYMMETRICAL DOUBLE-SIDED SERPENTINE BEAM-MASS STRUCTURE
Qingsong Li, Dingbang Xiao, Zhanqiang Hou, Xinghua Wang, Zhihua Chen, Xuezhong Wu
National University of Defense Technology, China

5-122
DEVELOPMENT OF STRETCHABLE STRAIN SENSOR USING ELASTIC FIBROUS MEMBRANE COATED WITH CONDUCTING POLYMER
Hyungkook Jeon[{2}], Geunbae Lim[{2}], Seong J. Cho[{1}]
[{1}]Chungnam National University, Korea; [{2}]Pohang University of Science and Technology, Korea

5-126
INDUCTIVE DETECTION OF GAS BUBBLES IN A LIQUID METAL FLOW
Thomas Gundrum[{1}], Philipp Büttner[{1}], Bachir Dekdouk[{2}], Anthony Peyton[{2}], Thomas Wondrak[{1}], Vladimir Galindo[{1}], Sven Eckert[{1}]
[{1}]Helmholtz-Zentrum Dresden-Rossendorf, Germany; [{2}]University of Manchester, United Kingdom

5-130
IMPLEMENTATION OF THE DIGITAL-DOWN-CONVERSION (DDC) AND SOFTWARE FOR THE OPTIMIZATION OF THE GIANT MAGNETO-IMPEDANCE (GMI) SENSORS
Papa Silly Traore, Aktham Asfour, Jean-Paul Yonnet
Université Grenoble Alpes, France

13-261
PERFORMANCE ANALYSIS OF MINIATURIZED PCB COILS FOR SMALL-APERTURE MAGNET QUALIFICATION
Pasquale Arpaia[{2}], Marco Buzio[{1}], Olaf Dunkel[{1}], Mauro D'arco[{2}], Stephan Russenschuck[{1}], Giordana Severino[{1}]
[{1}]European Organization for Nuclear Research, Switzerland;
[{2}]Università degli Studi di Napoli Federico II, Italy

13-263
DEVELOPMENT OF A HALL-EFFECT BASED SKIN SENSOR
Tito Pradhono Tomo[2], Sophon Somlor[2], Alexander Schmitz[2], Shuji Hashimoto[2], Shigeki Sugano[2], Lorenzo Jamone[1]
[1]Instituto Superior Técnico, Portugal; [2]Waseda University, Japan

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12:30 - 14:00
B3P-M: ACTUATOR & ENERGY HARVESTER
ROOMS 101-110
SESSION CHAIR: Pit Pillatsch (University of California, Berkeley)

6-134
WI-FI-CONNECTED RADIATION MEASUREMENT SYSTEM BY SMALL-SCALE SOLAR ENERGY HARVESTING
Yoshinori Matsumoto[1], Masatoshi Satoh[2]
[1]Keio university, Japan; [2]Yaguchi ELectric Co.,Ltd., Japan

6-138
A HANDY MOTION DRIVEN, FREQUENCY UP-CONVERTING PIEZOELECTRIC ENERGY HARVESTER USING FLEXIBLE BASE FOR WEARABLE SENSORS APPLICATIONS
Md. Abdul Halim Miah, Hyunok Cho, Jae Yeong Park
Kwangwoon University, Korea

6-142
PRESSURE COMPENSATION BEHAVIOR INSIDE AN EWOD OSCILLATOR
Andreas Tröls, Bernhard Jakoby
Johannes Kepler Universität Linz, Austria

6-146
ELECTROWETTING INTERFACIAL TENSION MEASUREMENT SYSTEM
Seungyul Choi, Junghoon Lee
Seoul National University, Korea

6-150
THE STUDY OF A RF MEMS SWITCH BASED ON LCP SUBSTRATE
Xiaofeng Gao, Lei Han, Meng Nie, Qing-An Huang
Southeast University, China

6-152
A MILLI-VOLT TRIGGERED MEMS PADDLE SWITCH
Aishwaryadev Banerjee, Shashank Pandey, Niladri Banerjee, Nazmul Hasan, Carlos H. Mastrangelo
University of Utah, USA

6-154
FABRICATION OF MICROCOIL WITH LARGE TILT-ANGLE ON POLYMER TUBE FOR ELECTROMAGNETICALLY-DRIVEN SCANNER IN SINGLE FIBER ENDOSCOPE
Zhuoqing Yang[{2}], Qihuan Zhang[{2}], Yi Zhang[{1}], Toshihiro Itoh[{1}], Ryutaro Maeda[{1}], Jinyuan Yao[{2}], Guifu Ding[{2}]
[{1}]National Institute of Advanced Industrial Science and Technology, Japan; [{2}]Shanghai Jiao Tong University, China

13-265
STUDY ON THE PZT DIAPHRAGM ACTUATED MULTIPLE JET FLOW IN A CIRCULATORY MINIATURIZED SYSTEM
Tung Thanh Bui[{2}], Thien Xuan Dinh[{3}], Phan Thanh Hoa[{1}], Van Thanh Dau[{4}]
[{1}]Hanoi University of Industry, Vietnam; [{2}]National Institute of Advanced Industrial Science and Technology, Japan; [{3}]Ritsumeikan University, Japan; [{4}]Sumitomo Chemical. Ltd, Japan

13-267
A WIRELESS MULTI-SENSOR SYSTEM FOR SOIL MOISTURE MEASUREMENT
Aravind P, Mangesh Gurav, Aakash Mehta, Rohan Shelar, Jobish John, Vinay S Palaparthy, Kamlesh Kumar Singh, Shahbaz Sarik, Maryam Shojaei Baghini
Indian Institute of Technology Bombay, India

12:30 - 14:00
B3P-N: SENSOR NETWORK AND APPLICATION II
ROOMS 101-110
SESSION CHAIR: Mohamed Abdelmoneum (Intel Corporation)

7-158
ACOUSTIC ECHO PATH DELAY ESTIMATION BY MEANS OF A BOC-BPSK CORRELATION METHOD
Florian Beaubois, Ikhlas Selmi, Jean-Bernard Choquel, Jean-Charles Noyer, Serge Reboul
University of Littoral Côte Opale, France

7-161
HRCCTP: A HYBRID RELIABLE AND CONGESTION CONTROL TRANSPORT PROTOCOL FOR WIRELESS SENSOR NETWORKS
Trilok Chand, Bhisham Sharma
PEC University of Technology, India

7-163
DUX-MAC: A DUAL CHANNEL X-MAC PROTOCOL FOR WSNS
Shafika Showkat Moni[{1}], Md Al Mamun[{2}], Mohammad Shah Alam[{1}]
[{1}]Bangladesh University of Engineering and Technology, Bangladesh; [{2}]Rajshahi University of Engineering and Technology, Bangladesh

7-166
INTERNET OF THINGS: SENSOR TO SENSOR COMMUNICATION
Rajeshkumar Gunasagaran, Latifah Munirah Kamarudin, Ammar Zakaria, Ericson Kanagaraj, Muhammad Shaiful Alimon, Ali Yeon Md. Shakaff, Phaklen Ehkan, Retnam Visvanathan, Mohd Hafiez Mohd Razali
Universiti Malaysia Perlis, Malaysia

7-168
CLOUD-BASED REMOTE ENVIRONMENTAL MONITORING SYSTEM WITH DISTRIBUTED WSN WEATHER STATIONS
Ericson Kanagaraj, Latifah Munirah Kamarudin, Ammar Zakaria, Rajeshkumar Gunasagaran, Ali Yeon Md. Shakaff
Universiti Malaysia Perlis, Malaysia

13-269
UBIQUITOUS MONITORING OF PEDESTRIAN DYNAMICS: EXPLORING WIRELESS AD HOC NETWORK OF MULTI-SENSOR TECHNOLOGIES
Bilal Farooq, Alexandra Beaulieu, Marwan Ragab, Viet-Dang Ba
Polytechnique Montreal, Canada

13-271
A MESH NETWORK FOR MOBILE DEVICES USING BLUETOOTH LOW ENERGY
Shruthi Sirur{2}, Praneeth Juturu{2}, Hari Prabhat Gupta{2}, Pramod Reddy Serikar{2}, Yaswanth Kumar Reddy{2}, Sulekha Barak{2}, Bonggon Kim{1}
{1}Samsung Electronics, Korea; {2}Samsung R&D Institute Bangalore, India

13-273
TRCCTP: A TRAFFIC REDIRECTION BASED CONGESTION CONTROL TRANSPORT PROTOCOL FOR WIRELESS SENSOR NETWORKS
Trilok Chand, Bhisham Sharma, Manpreet Kour
PEC University of Technology, India

12:30 - 14:00
B3P-P: OPTICAL SENSING APPLICATIONS II
ROOMS 101-110
SESSION CHAIR: Harald Steiner (Danube University Krems)

8-176
DESIGN OF CRYOGENIC FLOW METER USING FIBER BRAGG GRATING SENSORS
Sankar Ram Thekkethil, Venkatraman Narayanan Venkatesan, Holger Neumann, Rajinikumar Ramalingam
Karlsruher Institut für Technologie, Germany

8-178
MOBILE ROBOT LOCALIZATION SYSTEM USING MULTIPLE CEILING MOUNTED CAMERAS
Retnam Visvanathan, Syed Muhammad Mamduh, Kamarulzaman Kamarudin, Ahmad Shakaff Ali Yeon, Ammar Zakaria, Ali Yeon Md. Shakaff, Latifah Munirah Kamarudin, Fathinul Syahir Ahma Saad
Universiti Malaysia Perlis, Malaysia

8-183
STR-OCTREE INDEXING METHOD FOR PROCESSING LIDAR DATA
Permata Nur Miftahur Rizki[1], Jaehwan Park[1], Sangyoon Oh[1], Heezin Lee[2]
[1]Ajou University, Korea; [2]University of California, Berkeley , USA

8-185
TURBIDITY MONITORING OF LAKE WATER BY TRANSMITTANCE MEASURESMENT WITH A SIMPLE OPTICAL SETUP
Ryohei Komiyama, Tomoaki Kageyama, Masashi Miura, Hidetoshi Miyashita, Sang-Seok Lee
Tottori University, Japan

8-188
REFLECTION BASED BLOOD PULSATION MEASUREMENT USING LINEAR POLARIZATION OF LIGHT
Deepak Mishra, Supriya Chakraborty, Mukul Sarkar
Indian Institute of Technology Delhi, India

8-192
HYPERSPECTRAL IMAGING APPLIED TO THE IDENTIFICATION AND CLASSIFICATION OF ASBESTOS FIBERS
Giuseppe Bonifazi, Giuseppe Capobianco, Silvia Serranti
Sapienza - Università di Roma, Italy

8-196
IN-ORBIT ERROR CALIBRATION OF STAR SENSOR BASED ON HIGH RESOLUTION IMAGING PAYLOAD
Jing Yang[1], Kang Wang[1], Kai Xiong[2]
[1]Beihang University, China; [2]Beijing Institute of Control Engineering, China

8-200
A PORTABLE SYSTEM FOR ESTIMATION OF CHEMICAL OXYGEN DEMAND IN WASTEWATER USING ULTRAVIOLET-VISIBLE SPECTROSCOPY
Tasnim Alam[2], Babak Rezania[1], Behraad Bahreyni[2]
[1]Prongineer R&D Ltd, Canada; [2]Simon Fraser University, Canada

8-204
FOURTH-PERSON SENSING FOR A SERVICE ROBOT
Kazuto Nakashima, Yumi Iwashita, Pyo Yoonseok, Asamichi Takamine, Ryo Kurazume
Kyushu University, Japan

8-208
SENSING FRESH WATER CONTAMINATION USING FLUORESCENCE METHODS
Julius Okache, Barry Haggett, Robin Maytum, Andrew Mead, David Rawson, Tahmina Ajmal
University of Bedfordshire, United Kingdom

12:30 - 14:00
B3P-Q: OTHER SENSORS TOPICS II
ROOMS 101-110
SESSION CHAIR: Marina Cole (University of Warwick)

9-213
REAL-TIME WHITENING APPLICATION TO TWO MICROPHONE SENSORS FOR COMB FILTERING AND SMOOTHING
Jinsoo Jeong
Universiti Kuala Lumpur, Malaysia

9-216
A NOVEL DUAL PIPELINE ULTRAFAST REAL-TIME 'RIPPLE SORT' ALGORITHM AND CIRCUIT IMPLEMENTATION
Ching Man[{2}], Elfed Lewis[{2}], Brian Moss[{1}]
[{1}]InvenSense Inc., Ireland; [{2}]University of Limerick, Ireland

9-219
FABRICATION OF CMUTS WITH A LOW TEMPERATURE WAFER BONDING TECHNOLOGY
Zhikang Li, Libo Zhao, Zhuangde Jiang, Ping Li, Yingjie Hu, Yulong Zhao
Xi'an Jiaotong University, China

9-222
A FLUXGATE MAGNETOMETER FOR NAVIGATION AND SENSING: NOISE CHARACTER AND DIGITAL FILTERING
Jiabo Wang, Xi Chen
Tsinghua University, China

9-225
FABRICATION OF SWNTS/ALPHA-FE2O3 AS ROOM-TEMPERATURE LPG SENSOR
Buaworn Chaitongrat, Sutichai Chaisitsak
King Mongkut's Institute of Technology Ladkrabang, Thailand

9-228

GEMINI, A CMOS 180 NM MIXED-SIGNAL 16-CHANNEL ASIC FOR TRIPLE-GEM DETECTORS READOUT

Alessandro Pezzotta[{2}], Giovanni Corradi[{1}], Gabriele Croci[{2}], Marcello De Matteis[{2}], Fabrizio Murtas[{1}], Diego Tagnani[{1}], Giuseppe Gorini[{2}], Andrea Baschirotto[{2}]

[{1}]INFN Laboratori Nazionali di Frascati, Italy; [{2}]Università degli Studi di Milano-Bicocca, Italy

9-231

MULTI-DIMENSIONAL VIBRATION ENERGY HARVESTER FOR EFFICIENT USE IN COMMON ENVIRONMENT

Jeongjin Yeo, Heajeong Park, Jonghyun Jo, Yoonseok Yang

Chonbuk National University, Korea

9-234

ENERGY HARVESTING FROM FOOD WASTE BY INOCULATION OF VERMICOMPOSTED ORGANIC MATTER INTO MICROBIAL FUEL CELL (MFC)

Sangyeon Youn, Jeongjin Yeo, Hyeyoun Joung, Yoonseok Yang

Chonbuk National University, Korea

9-237

A HIGH-PERFORMANCE SELF-CLOCKED DIGITAL-OUTPUT QUARTZ GYROSCOPE

Ayman Ismail, Khaled Ashraf, Ahmed Metawea, Islam Mostfa, Ahmed Saeed, Eslam Helal, Mostafa Essawy, Mohamed Abdelazim, Mostafa Ibrahim, Ramy Raafat, Eslam Abdelbary, Islam Alaa, Marawan Nabil, Abdelrahman Mansour, Bassem Ibrahim, Ayman Elsayed

Si-ware Systems, Egypt

9-240

A CHARACTERIZATION METHOD FOR PROJECTED CAPACITIVE TOUCH SCREEN PANEL USING 3-PORT IMPEDANCE MEASUREMENT TECHNIQUE

Chang-Ju Lee[{2}], Do-Yeon Kim[{2}], Jong Kang Park[{2}], Jong Tae Kim[{2}], Jung-Hoon Chun[{2}], Jin-Bong Kim[{1}], Yoon-Kyung Choi[{1}], Hwi-Taek Jeong[{1}], Gyoo-Cheol Hwang[{1}]

[{1}]Samsung Electronics, Korea; [{2}]Sungkyunkwan University, Korea

9-244

INFLUENCE OF DEPOSITION TEMPERATURE ON TIO2-X FILMS FOR INFRARED IMAGE SENSOR APPLICATIONS

Y. Ashok Kumar Reddy, Young Bong Shin, In-Ku Kang, Hee Chul Lee

Korea Advanced Institute of Science and Technology, Korea

9-246

CUSTOM PXIE-567X SOFTWARE DEFINED INTERROGATION SIGNAL GENERATOR FOR SURFACE ACOUSTIC WAVE BASED PASSIVE RFID

Aina Heritiana Rasolomboahanginjatovo, Yamoussa Sanogo, Frederic Domingue, Adel Omar Dahmane
Universite du Quebec a Trois-Rivieres, Canada

14:00 - 15:30
B4L-A: ELECTROCHEMICAL SENSORS
ROOM 201
SESSION CHAIRS: John Atkinson (University of Southampton) Binu Narakathu (Western Michigan University)

14:00

PHOSPHATE SENSORS BASED ON CO-CU ELECTRODES FABRICATED WITH A SACRIFICIAL GLASS FIBER PAPER TEMPLATE

Xiaochen Wang, Jared Church, Woo Hyoung Lee, Hyoung Jin Cho
University of Central Florida, USA

14:15

ISFET-BASED PH SENSOR COMPOSED OF A HIGH TRANSCONDUCTANCE CMOS CHIP AND A DISPOSABLE TOUCH PANEL FILM AS THE SENSING LAYER

Shang-Jing Wu{2}, Yung-Chen Wu{2}, Hann-Huei Tsai{1}, Hsin-Hao Liao{1}, Ying-Zong Juang{1}, Che-Hsin Lin{2}
{1}National Applied Research Laboratories, Taiwan; {2}National Sun Yat-sen University, Taiwan

14:30

SELECTIVE ELECTROCHEMICAL SENSOR FOR PHOSPHATE DETERMINATION TOWARD A SILICATE INTERFERENCE FREE METHOD IN FRESHWATER

Yu Song, Chao Bian, Jianhua Tong, Yang Li, Shanhong Xia
Institute of Electronics, Chinese Academy of Sciences, China

14:45
CHEMICAL ANALYSIS OF THIN ALD-AL2O3 FILMS AND THEIR APPLICATIONS AS PH-SENSITIVE LAYERS IN CMOS-COMPATIBLE ION-SENSITIVE CAPACITORS (ISCAP)
Berni Perez Ramos, Alejandro Diaz Sanchez, Joel Molina Reyes
Instituto Nacional de Astrofisica, Optica y Electronica, Mexico

15:00
A MICROFLUIDIC DEVICE FULLY INTEGRATED WITH THREE PH SENSING ELECTRODES AND PASSIVE MIXER FOR NANOPARTICLE SYNTHESIS
Ryohei Komiyama{2}, Hidetoshi Miyashita{2}, Tomoaki Kageyama{2}, Koutoku Ohmi{2}, Sang-Seok Lee{2}, Hiroshi Okura{1}
{1}Merck Ltd., Japan; {2}Tottori University, Japan

14:00 - 15:30
B4L-B: PRESSURE & STRAIN SENSORS
ROOM 202
SESSION CHAIRS: Massood Atashbar (Western Michigan University)
Tania Mukherjee (Indian Institute of Technology Kharagpur)

14:00
INVITED: EVALUATING CONTACT FORCE BASED ON DISPLACEMENT MEASUREMENT OF CANTILEVER BEAMS FOR MEMS SWITCHES AND SENSOR APPLICATIONS
John McBride{1}, A. P. Lewis{2}, M. P. Down{2}
{1}University of Southampton, United Kingdom; {2}University of Southampton Malaysia Campus, United Kingdom

14:30
MEMS-BASED CAPACITIVE PRESSURE SENSORS WITH PRE-STRESSED SENSING DIAPHRAGMS
Duy Son Nguyen{2}, Pit Pillatsch{2}, Yiping Zhu{1}, Igor Paprotny{3}, Paul Wright{2}, Richard White{2}
{1}East China Normal University, Shanghai, China; {2}University of California, Berkeley, USA; {3}University of Illinois at Chicago, USA

14:45
NOVEL METHOD TO OPERATE PIEZO-FET-BASED STRESS SENSOR OFFERS TENFOLD INCREASE IN SENSITIVITY
Felix Becker, Matthias Kuhl, Yiannos Manoli, Oliver Paul
Albert-Ludwigs-Universität Freiburg, Germany

15:00
CHARACTERIZATION OF BIFEO3 THIN FILM FOR TACTILE SENSOR USING MICROCANTILEVERS WITH PIEZOELECTRIC CAPACITOR AND STRAIN-GAUGE
Takeshi Kohno[{1}], Takashi Abe[{1}], Masayuki Sohgawa[{1}], Masanori Okuyama[{2}], Haruo Noma[{3}]
[{1}]Niigata University, Japan; [{2}]Osaka University, Japan; [{3}]Ritsumeikan University, Japan

15:15
MICROCANTILEVER ARRAYS COATED WITH PHOTOACTIVE POLYMERIC BRUSHES AS SYSTEMS TO MEASURE PHOTO-INDUCED SURFACE STRESS CHANGES
Larisa Florea[{1}], Slavica Koprivica[{1}], Silvia Scarmagnani[{1}], Dermot Diamond[{1}], Fernando Benito-Lopez[{2}], Catherine Grogan[{3}], Fran Pedreschi[{3}], Luke O'Neill[{3}], Fiona Lyng[{3}], Roberto Raiteri[{4}]
[{1}]Dublin City University, Ireland; [{2}]Dublin City University & University of the Basque Country, Spain; [{3}]Dublin Institute of Technology, Ireland; [{4}]Università degli Studi di Genova, Italy

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14:00 - 15:30
B4L-C: ACOUSTIC STRUCTURES
ROOM 203
SESSION CHAIRS: Svetlana Tatic-Lucic (Lehigh University USA) Erwin Reichel (JKU University, Linz, Austria)

14:00
TUNABLE QUALITY FACTOR THROUGH 1:1 MODAL COUPLING IN A DISK RESONATOR
Ian Flader, Chae Ahn, Yushi Yang, Eldwin Ng, Vu Hong, Jeesu Baek, Thomas W. Kenny
Stanford University, USA

14:15
HIGHLY-SYMMETRIC SILICON DIOXIDE SHALLOW SHELL RESONATORS WITH ANGSTROM-LEVEL ROUGHNESS
Benoit Hamelin, Vahid Tavassoli, Farrokh Ayazi
Georgia Institute of Technology, USA

14:30
DEGENERATE MODES OF OPERATION IN LITHIUM NIOBATE SENSORS
Zeyad Al-Shibaany, John Hedley, Zhongxu Hu
Newcastle University, United Kingdom

14:45
SENSOR DESIGN AND CALIBRATION OF PIEZORESISTIVE COMPOSITE MATERIAL
Veit Müller[{1}], Markus Fritzsche[{2}], Norbert Elkmann[{2}]
[{1}]Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Germany; [{2}]Fraunhofer-Institut für Fabrikbetrieb und -automatisierung IFF, Germany

15:00
NONLINEAR DYNAMICS OF CIRCULAR CAPACITIVE MICROMACHINED ULTRASONIC TRANSDUCERS
Najib Kacem, Aymen Jallouli, Vincent Walter, Gilles Bourbon, Patrice Lemoal, Joseph Lardies
FEMTO-ST Institute, France

15:15
A NEW METHOD FOR MAPPING FIELDS IN COUPLED CYLINDRICAL DIELECTRIC RESONATORS
Olutosin Fawole, Massood Tabib-Azar
University of Utah, USA

14:00 - 15:00
B4L-D: OPTICAL BIOSENSORS
ROOM 204
SESSION CHAIRS: Paddy French (Delft University of Technology) Elfed Lewis (University of Limerick)

14:00
A TWO-DIMENSIONAL FLUOROMETRIC IMAGING "SNIFFER CAMERA" OF ETHANOL VAPOR FOR EVALUATION OF ALCOHOL METABOLISM USING ENZYMATIC REACTION
Takahiro Arakawa, Koji Toma, Kohji Mitsubayashi, Kenta Iitani, Toshiyuki Sato
Tokyo Medical and Dental University, Japan

14:15
DISCRIMINATION OF TARGET PROTEINS USING ARRAYED FLUORESCENT LIPOSOMES INCORPORATED WITH CHOLESTEROL BY PRINCIPAL COMPONENT ANALYSIS
Ryota Imamura[{1}], Ziyang Zhang[{1}], Tomoki Yoshikawa[{1}], Naoki Murata[{1}], Kaoru Yamashita[{1}], Masayuki Fukuzawa[{1}], Minoru Noda[{1}], Toshinori Shimanouchi[{2}]
[{1}]Kyoto Institute of Technology, Japan; [{2}]Okayama University, Japan

14:30
SERS-BASED HYDROGEL SENSORS FOR PH AND ENZYMATIC SUBSTRATES
Yil-Hwan You, Ashvin Nagaraja, Aniket Biswas, Haley Marks, Gerard Coté, Michael McShane
Texas A&M University, USA

14:45
HIGH-THROUGHPUT DROPLET-BASED SCREENING SYSTEM FOR INVESTIGATING MICROALGAE LIBRARY
Hyun Soo Kim, Adrian Guzman, Nebras Sobahi, Hem Thapa, Timothy Devarenne, Arum Han
Texas A&M University, USA

14:00 - 15:30
B4L-E: CHEMICAL & BIO SENSOR SYSTEMS
ROOM 206
SESSION CHAIRS: Walaa Khalaf (Almustansiriya University)
Tony Jun Huang (Pennsylvania State University)

14:00
INVITED: NANOMATERIAL INTEGRATED MICROFLUIDIC DEVICES FOR VIRUS ANALYSIS
Yin-Ting Yeh, Yiqiu Xia, Xu Yu, Si-Yang Zheng
Pennsylvania State University, USA

14:30
INTEGRATION OF FRACTAL BIOSENSOR IN A DIGITAL MICROFLUIDIC PLATFORM
Yousof Mashraei, Shilpa Sivashankar, Ulrich Buttner, Khaled Nabil Salama
King Abdullah University of Science and Technology, Saudi Arabia

14:45
AN ELECTROCHEMICAL SENSOR SYSTEM WITH RENEWABLE COPPER MODIFIED ELECTRODE FOR CONTINUOUS NITRATE DETERMINATION
Yang Li, Heng Li, Yu Song, Hua Lu, Jizhou Sun, Jianhua Tong, Chao Bian, Shanhong Xia
Institute of Electronics, Chinese Academy of Sciences, China

15:00
A RENEWABLE BOD MICROSENSOR BASED ON MAGNETICALLY FUNCTIONALIZED MICROORGANISM AND ULTRAMICROELECTRODE ARRAY
Jinfen Wang, Chao Bian, Yijin Li, Jianhua Tong, Jizhou Sun, Wen Hong, Shanhong Xia
Institute of Electronics, Chinese Academy of Sciences, China

15:15
FACILE DETECTION OF TROPONIN I USING DENDRITIC PLATINUM NANOPARTICLES AND CAPILLARY TUBE INDICATORS
Sanghee Lee, Donghoon Kwon, Changyong Yim, Sangmin Jeon
Pohang University of Science and Technology, Korea

14:00 - 15:15
B4L-F: SENSORS READOUT/INTERFACE/CIRCUITS II
ROOM 207
SESSION CHAIRS: Takahito Ono (Tohoku University)
Ulrich Schmid (Vienna University of Technology)

14:00
MULTIMODAL ANALOG FRONT-END FOR WEARABLE BIO-SENSORS
Insoo Kim, Ryan Lobo, Johnny Homer, Yusuf Bhagat
Samsung Research America, USA

14:15
A MUTUAL-CAPACITIVE TOUCH SENSOR ROIC USING A PLL TO REDUCE LCD NOISE BY SYNCHRONIZING ROIC TX CLOCK TO LCD CLOCK
Dong-Hee Yeo, Seon-Ho Kim, Hyeon-Kyu Noh, Jae-Yoon Sim, Byungsub Kim, Hong-June Park
Pohang University of Science and Technology, Korea

14:30
ALL-DIGITAL-ADC TAD IN SENSOR DIGITIZATION FOR SCALING OVER WIDE TEMPERATURE RANGES
Takamoto Watanabe, Tomohito Terasawa
Denso Corporation, Japan

14:45
SILICON CARBIDE BASED INSTRUMENTATION AMPLIFIERS FOR EXTREME APPLICATIONS
Hua-Khee Chan, Neal Wood, Konstantin Vassilevski, Nick Wright, Amy Peters, Alton Horsfall
University of Newcastle, United Kingdom

15:00
INTERFACE CIRCUIT FOR THREE-ELECTRODE METAL-OXIDE (MOX) GAS SENSOR
Jeong-Ho Park, Kwang-Min Park, Tae-Wan Kim, Chong-Ook Park, Hyung-Joun Yoo
Korea Advanced Institute of Science and Technology, Korea

14:00 - 15:30
PROFESSIONAL DEVELOPMENT PROGRAM I
ROOM 208

14:00
Gianluca Lazzi (University of Utah, USA)
Troy Nagle(North Carolina State University, USA)

14:15
SENSORS COUNCIL AWARDS PROGRAM
Mike McShane (Texas A&M University, USA)

14:30
YOUNG PROFESSIONALS PROGRAM
Sinead O'Keeffe (University of Limerick, Ireland)

14:45
ORGANIZING COUNCIL CHAPTERS
Ramesh Ramadoss (San Francisco Bay Area Council Chapter Chair, USA)

15:00
MENTORING ROUNDTABLE
Sharon Peng (Harman International, USA)

15:30 - 16:00
TUESDAY AFERNOON BREAK
2F LOBBY

16:00 - 17:15
B5L-A: ACOUSTIC WAVE CHEMICALS SENSORS
ROOM 201
SESSION CHAIRS: Matteo Rinaldi (Northeastern University)
Junghoon Lee (Seoul National University)

16:00
CONCENTRATION-INDEPENDENT FINGERPRINT LIBRARY OF VOLATILE ORGANIC COMPOUNDS BASED ON GAS-SURFACE INTERACTIONS BY SELF-ASSEMBLED MONOLAYER FUNCTIONALIZED FILM BULK ACOUSTIC RESONATOR ARRAYS
Yao Lu, Ye Chang, Ning Tang, Hemi Qu, Wei Pang, Daihua Zhang, Hao Zhang, Xuexin Duan
Tianjin University, China

16:15
CHEMICAL SENSING BASED ON GRAPHENE-ALUMINUM NITRIDE NANO PLATE RESONATORS
Zhenyun Qian, Yu Hui, Fangze Liu, Swastik Kar, Matteo Rinaldi
Northeastern University, USA

16:30
POLYMER COATED FILM BULK ACOUSTIC RESONATOR (FBAR) ARRAYS FOR INDOOR AIR QUALITY (IAQ) MONITORING
Si Hoon Lee, Yongmi Jung, Taepyeong Kim, Taegyu Kim, Younghwan Kim, Suntae Jung
Samsung Electronics, Korea

16:45
INKJET - PRINTED GRAPHENE LAYER BY LAYER ON SAW DEVICES FOR GAS DETECTION APPLICATIONS
Ioannis Nikolaou[{2}], Hamida Hallil[{2}], Corinne Dejous[{2}], Dominique Rebière[{2}], George Deligeorgis[{3}], Veronique Conedera[{1}]
[{1}]LAAS CNRS, France; [{2}]Université de Bordeaux, France; [{3}]University of Crete, Greece

17:00
A POLYMER BASED SENSOR FOR PHOSPHATE DETECTION IN WATER
Faezeh Arab Hassani, Nicola A Morley, Maria Romero-González
University of Sheffield, United Kingdom

16:00 - 17:30
B5L-B: PHYSICAL SENSORS I
ROOM 202
SESSION CHAIRS: Jurgen Kosel (King Abdullah University of Science and Technology (KAUST))
Sina Akhbari (University of California at Berkeley)

16:00
TOWARDS LOW-COST PRINTED FLOW SENSORS
Harald Steiner[{2}], Thomas Glatzl[{2}], Almir Talic[{2}], Samir Cerimovic[{2}], Franz Kohl[{2}], Marlies Schlauf[{1}], Thomas Schalkhammer[{1}], Franz Keplinger[{3}], Thilo Sauter[{2}]
[{1}]attophotonics Gmbh, Austria; [{2}]Danube University Krems, Austria; [{3}]Technische Universität Wien, Austria

16:15
A 2D PARTICLE VELOCITY SENSOR WITH MINIMAL FLOW-DISTURBANCE
Olti Pjetri, Remco Wiegerink, Gijs Krijnen
Universiteit Twente, Netherlands

16:30
U-SHAPED WIRE BASED RESONATORS FOR MASS DENSITY AND VISCOSITY SENSING
Martin Heinisch[{2}], Erwin Konrad Reichel[{2}], Ali Abdallah[{2}], Stefan Clara[{2}], Bernhard Jakoby[{2}], Thomas Voglhuber-Brunnmaier[{1}], Isabelle Dufour[{3}]
[{1}]Danube University Krems, Austria; [{2}]Johannes Kepler Universität Linz, Austria; [{3}]Université de Bordeaux, France

16:45

APPLICATION OF CARBON NANOTUBE AND GRAPHENE NANOCOMPOSITES FOR FABRICATION OF MICRO-BOLOMETERS

Ibrahim El-Chami[{1}], Oberon Dixon-Luinenburg[{2}], Behraad Bahreyni[{1}]
[{1}]Simon Fraser University, Canada; [{2}]University of Waterloo, Canada

17:00

MOS-CAPACITOR-BASED IONIZING RADIATION SENSORS FOR OCCUPATIONAL DOSIMETRY APPLICATIONS

Sean Scott[{2}], Charilaos Mousoulis[{2}], Nithin Raghunathan[{2}], Dimitrios Peroulis[{2}], Daniel Valentino[{1}], Paul Alexander Walerow[{1}], Mark Salasky[{1}], Harikrishna Rajabather[{1}], James Thistlethwaite[{1}], Timothy McNamee[{1}]
[{1}]Landauer, Inc., USA; [{2}]Purdue University, USA

17:15

CMOS BEOL-EMBEDDED LATERAL ACCELEROMETER

Piotr Michalik[{2}], Josep Maria Sánchez-Chiva[{2}], Daniel Fernández[{1}], Jordi Madrenas[{2}]
[{1}]Nanusens / Universitat Politècnica de Catalunya, Spain; [{2}]Universitat Politecnica de Catalunya, Spain

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16:00 - 17:30
B5L-C: METHODS/CHARACTERIZATION/SYSTEMS
ROOM 203
SESSION CHAIRS: Joseph Talghader (University of Minnesota)
Donald Malocha (University of Central Florida)

16:00

AN INTEGRATED POTENTIOSTAT SENSOR WITH DIGITALLY-CONTROLLED INPUT-PARASITIC COMPENSATION FOR NANOPORE APPLICATIONS

Jeong-Dae Yun[{1}], Jungsuk Kim[{1}], Jong-Bum Park[{2}]
[{1}]Gachon University, Korea; [{2}]Korea Electronics Technology Institute, Korea

16:15

A NEW METHOD FOR MEASURING THE TEMPERATURE-DEPENDENT DIELECTRIC CONSTANT OF THE PDMS FLUIDS

Qing-Ying Ren, Li-Feng Wang, Qing-Ying Huang
Southeast University, China

16:30
A DELAY LOCKED LOOP FOR INSTANTANEOUS TIME-OF-FLIGHT SENSING BASED ON A CMOS DEMODULATION DETECTOR
Robin Deleener, Hans Ingelberts, Maarten Kuijk
Vrije Universiteit Brussel, Belgium

16:45
ROBUST DIGITAL CALIBRATION ENGINE FOR MEMS INERTIAL SENSOR SYSTEMS
Sascha Heinssen, Nico Hellwege, Nils Heidmann, Steffen Paul, Dagmar Peters-Drolshagen
Universität Bremen, Germany

17:00
SMARTPHONE-BASED SYSTEM FOR THE MONITORING OF VITAL PARAMETERS AND STRESS CONDITIONS OF AMATORIAL RACECAR DRIVERS
Claudio Crema, Alessandro Depari, Alessandra Flammini, Angelo Vezzoli, Claudio Benini, Daniel Chindamo, Marco Gadola, Matteo Romano
Università degli Studi di Brescia, Italy

17:15
HIGH TEMPERATURE RELIABILITY AND FAILURE OF W-BASED MICROHOTPLATES
Junwei Zhou, Jun Yu, Zhongzhou Li, Kaiqiang Liu, Zhenan Tang
Dalian University of Technology, China

16:00 - 17:15
B5L-D: FIBER OPTIC SENSORS
ROOM 204
SESSION CHAIRS: Ignacio Matias (Public University of Navarra) Huikai Xie (University of Florida)

16:00
RADIOLUMINESCENCE BASED OPTICAL FIBRE SENSOR FOR RADIATION MONITORING DURING BRACHYTHERAPY
Sinead O'Keeffe{3}, Peter Woulfe{1}, Francis J. Sullivan{2}
{1}Galway Clinic, Ireland; {2}NUI Galway, Ireland; {3}University of Limerick, Ireland

16:15
TAPERED PHOTONIC CRYSTAL FIBER BASED MACH-ZEHNDER INTERFEROMETER FOR ENHANCED REFRACTIVE INDEX SENSING
Farid Ahmed, Martin Jun
University of Victoria, Canada

16:30
INTERFEROMETRIC FIBER-OPTIC CURRENT SENSOR WITH INHERENT SOURCE WAVELENGTH SHIFT COMPENSATION
Miklos Lenner, Wei Quan, Georg Müller, Lin Yang, Andreas Frank, Klaus Bohnert
ABB Switzerland Ltd., Switzerland

16:45
REFRACTOMETER USING PHOTONIC CRYSTALS FOR FERMENTATION PROCESS CHARACTERIZATION
Andras Kovacs, Alexey Ivanov, Ulrich Mescheder
Hochschule Furtwangen University, Germany

17:00
TEMPERATURE-COMPENSATED OPTIMIZED RELATIVE HUMIDITY AND REFRACTIVE INDEX SENSORS USING A HYBRID FIBRE GRATING CONFIGURATION
Lourdes Alwis[{2}], Tong Sun[{1}], Kenneth Grattan[{1}]
[{1}]City University London, United Kingdom; [{2}]Edinburgh Napier University, United Kingdom

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16:00 - 17:30
B5L-E: APPLICATIONS IN AGRICULTURE AND THE ENVIRONMENT
ROOM 206
SESSION CHAIRS: Yu-Cheng Lin (National Cheng Kung University)
Junghoon Lee (Seoul National University)

16:00
HEAT EVENT DETECTION IN DAIRY COWS WITH COLLAR SENSORS: AN UNSUPERVISED MACHINE LEARNING APPROACH
Md Sumon Shahriar[{1}], Daniel Smith[{1}], Ashfaqur Rahman[{1}], Dave Henry[{1}], Greg Bishop-Hurley[{1}], Richard Rawnsley[{2}], Mark Freeman[{2}], James Hills[{2}]
[{1}]Commonwealth Scientific and Industrial Research Organisation, Australia; [{2}]University of Tasmania, Australia

16:15
A STUDY OF SENSOR DERIVED FEATURES IN CATTLE BEHAVIOUR CLASSIFICATION MODELS
Daniel Smith, Bryce Little, Paul Greenwood, Philip Valencia, Ashfaqur Rahman, Aaron Ingham, Greg Bishop-Hurley, Sumon Shahriar, Andrew Hellicar
Commonwealth Scientific and Industrial Research Organisation, Australia

16:30

DESIGN OF A MEMORY-CARD BASED LOW-COST GPS DATA-LOGGER FOR LIVESTOCK MONITORING

Suleman Mazhar[4], Jahanzeb Gul[3], Faisal Mueen[2], Masroor Hussain[1]
[1]Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Pakistan; [2]International Centre for Integrated Mountain Development, Nepal; [3]Jeju National University, Korea; [4]Punjab University College of Information Technology / Unive

16:45

VISUALISATION OF ACOUSTIC ENTROPY INDEX FOR RAINFOREST HEALTH MONITORING SYSTEM

Mohd Hafiez Mohd Razali, Ammar Zakaria, Ali Yeon Md. Shakaff, Retnam Visvanathan, Fathinul Syahir Ahma Saad, Latifah Munirah Kamarudin, N. S. Hj Abdullah
Universiti Malaysia Perlis, Malaysia

17:00

DETECTION OF GUNSHOTS USING MICROPHONE ARRAY MOUNTED ON A MOVING PLATFORM

Thyagaraju Damarla
US Army Research Laboratory, USA

17:15

COMBINATION OF RADAR AND AUDIO SENSORS FOR IDENTIFICATION OF ROTOR-TYPE UNMANNED AERIAL VEHICLES (UAVS)

Seongha Park[2], Sangmi Shin[2], Yongho Kim[2], Eric Matson[2], Kyu Hwan Lee[2], Paul Kolodzy[1], Joseph Slater[4], Matthew Scherreik[4], Monica Sam[4], John Gallagher[4], Benjamin Fox[3], Michael Hopmeier[3]
[1]Kolodzy Consulting, USA; [2]Purdue University, Korea;
[3]Unconventional Concepts, Inc., USA; [4]Wright State University, USA

16:00 - 17:30
B5L-F: ELECTRONICS
ROOM 207
SESSION CHAIRS: Michael Lu (National Tsing Hua University)
Hongrui Jiang (University of Wisconsin)

16:00
A 0.13µM-CMOS 90µW 51DB-SNR CONTINUOUS-TIME ACCELEROMETER FRONT-END WITH 10B SAR-ADC
Marcello De Matteis[{2}], Alessandro Pezzotta[{2}], Marco Sabatini[{1}], Marco Grassi[{3}], Marco Croce[{3}], Piero Malcovati[{3}], Andrea Baschirotto[{2}]
[{1}]Pirelli Tyre, Italy; [{2}]Università degli Studi di Milano-Bicocca, Italy;
[{3}]Università degli Studi di Pavia, Italy

16:15
A CMOS DIGITIZED MONOLITHIC SUN SENSOR TRANSDUCER WITH CALIBRATION CIRCUITS FOR MONITORING SOLAR RADIATION OF TOMATO CROPS
Cheng-Ta Chiang, Jian-Xiang Lin
National Chia Yi University, Taiwan

16:30
HVCMOS PIXEL SENSORS
Ivan Peric, Felix Ehrler, Richard Leys, Roberto Blanco
Karlsruher Institut für Technologie, Germany

16:45
BATTERYLESS 900-µS-LATENCY FM TRANSMITTER POWERED BY PIEZOELECTRIC GENERATOR FOR WIRELESS ELECTRONIC DRUMS
Kengo Takemura, Ayumu Yoshimi, Hisashi Nishikawa, Ami Tanaka, Takakuni Douseki
Ritsumeikan University, Japan

17:00
TEMPERATURE COMPENSATED MEMS OSCILLATOR USING STRUCTURAL RESISTANCE BASED TEMPERATURE SENSING
Chang-Shun Liu, Roozbeh Tabrizian, Farrokh Ayazi
Georgia Institute of Technology, USA

17:15
BATTERYLESS SENSORLESS BICYCLE SPEED RECORDER WITH HUB DYNAMO AND STT-MRAM
Ami Tanaka[{3}], Takakuni Douseki[{3}], Yohei Umeki[{2}], Hiroshi Kawaguchi[{2}], Masahiko Yoshimoto[{2}], Koji Tsunoda[{1}], Toshihiro Sugii[{1}]
[{1}]Fujitsu Laboratories Ltd., Japan; [{2}]Kobe University, Japan;
[{3}]Ritsumeikan University, Japan

16:00 - 17:30
PROFESSIONAL DEVELOPMENT PROGRAM II
ROOM 208

16:00
ORGANIZING GREAT CONFERENCES
Yu-Cheng Lin (National Cheng Kung University, Taiwan)

16:20
SENSORS COUNCIL STANDARDS INITIATIVE
Sri Chandrasekaran (IEEE-SA, India)

16:40
SOLITICING & TRAINING JOURNAL REVIEWERS
Krikor Ozanyan (University of Manchester, United Kingdom)

17:00
AUTHOR TRAINING FOR JOURNALS AND CONFERENCE PROCEEDINGS
John Vig (Consultant, USA)

18:30 - 22:00
CONFERENCE BANQUET
BEXCO GRAND BALLROOM

08:00 - 08:30
WEDNESDAY LECTURE AUTHOR BREAKFAST
ROOM 211-212

08:30 -09:30
KEYNOTE: Sensing Technology for Upcoming Healthcare System
Suntae Jung
SAMSUNG Electronics Co., Ltd.
GRAND BALLROOM

09:30 - 10:00
WEDNESDAY MORNING BREAK
2F LOBBY

10:00 - 11:30
C2L-A: SPECIAL SESSION: 3D PRINTED SENSORS & ACTUATORS
ROOM 201
SESSION CHAIR: Gijs Krijnen (University of Twente)

10:00
INVITED: POLYMER COMPOSITES FOR 3D PRINTING OF FUNCTIONAL SENSORS AND TRANSDUCERS
Simon Leigh, Christopher Purssell, James Covington, Duncan Billson, David Hutchins, David Woodward, Nishal Ramadas
University of Warwick, United Kingdom

10:30
MULTI-FUNCTIONAL 3D PRINTED AND EMBEDDED SENSORS FOR SATELLITE QUALIFICATION STRUCTURES
Corey Shemelya[{3}], Luis Banuelos-Chacon[{3}], Adrian Melendez[{3}], Craig Kief[{2}], David Espalin[{3}], Ryan Wicker[{3}], Gijs Krijnen[{1}], Eric MacDonald[{3}]
[{1}]Universiteit Twente, Netherlands; [{2}]University of New Mexico, USA; [{3}]University of Texas at El Paso, USA

10:45
A SURVEY OF PRINTABLE PIEZOELECTRIC SENSORS
Sampo Tuukkanen, Satu Rajala
Tampere University of Technology, Finland

11:00
3D PRINTED BIO-INSPIRED ANGULAR ACCELERATION SENSOR
Joël van Tiem, Jarno Groenesteijn, Remco Sanders, Gijs Krijnen
Universiteit Twente, Netherlands

11:15

3D PRINTED MULTI-CHANNEL EEG SENSORS FOR ZEBRAFISH

Sung-Joon Cho[{2}], Tae-Seung Nam[{1}], Seok-Yong Choi[{1}], Myung-Kyu Kim[{1}], Sohee Kim[{2}]

[{1}]Chonnam National University Medical Center, Korea; [{2}]Gwangju Institute of Science and Technology, Korea

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10:00 - 11:30

C2L-B: ENVIRONMENTAL SENSORS

ROOM 202

SESSION CHAIRS: Harald Steiner (Danube University Krems) Lina Sarro (Delft University of Technology)

10:00

MOBALL: AN INTELLIGENT WIND-OPPORTUNISTIC MOBILE SENSOR TO MONITOR THE POLAR REGIONS

Faranak Davoodi[{2}], Junichi Asama[{3}], Mina Rais-Zadeh[{4}], Joel Burdick[{1}], Cyrus Shahabi[{5}]

[{1}]California Institute of Technology, USA; [{2}]Intelligent Buoy Networks, Inc., USA; [{3}]Shizuoka University, Japan; [{4}]University of Michigan, USA; [{5}]University of Southern California, USA

10:15

AN ELECTROCHEMICAL SEISMOMETER WITH FREQUENCY FEATURES UNDER REGULATION

Zhenyuan Sun, Wentao He, Guanglei Li, Deyong Chen, Junbo Wang, Jian Chen

Institute of Electronics, Chinese Academy of Sciences, China

10:30

FABRICATION OF A HYDROPHILIC PROPERTY IMPEDANCE SENSOR TO STABLY MONITOR SOIL WATER CONTENT FOR SLOPE FAILURE PROGNOSTICS

Masato Futagawa[{5}], Tatsumi Ito[{5}], Arumi Kunii[{3}], Minoru Watanabe[{2}], Hikofumi Suzuki[{4}], Yasushi Fuwa[{4}], Yuji Takeshita[{1}], Mitsuru Komatsu[{1}]

[{1}]Okayama University, Japan; [{2}]OKI Semiconductor, Japan; [{3}]OKI Semiconductor Miyagi, Japan; [{4}]Shinsyu University, Japan; [{5}]Shizuoka University, Japan

10:45

A SURFACE CONDUCTANCE BASED FULLY INTEGRATED STANDARD CMOS HUMIDITY SENSOR WITHOUT POST-PROCESSING

Jinsoo Choi[{1}], Gyusik Kim[{2}], Hyun-Ho Yang[{3}], Jun-Bo Yoon[{1}], Seonghwan Cho[{1}]

[{1}]Korea Advanced Institute of Science and Technology, Korea; [{2}]PIXELPLUS, Korea; [{3}]University of California, San Diego , USA

11:00
SEPARATE EXPERIMENTAL INVESTIGATION OF THE INFLUENCE OF LIQUIDS' MASS DENSITIES AND VISCOSITIES ON THE FREQUENCY RESPONSE OF RESONANT SENSORS USING DESIGNATED LIQUID SERIES
Martin Heinisch[{2}], Erwin Konrad Reichel[{2}], Bernhard Jakoby[{2}], Thomas Voglhuber-Brunnmaier[{1}], Isabelle Dufour[{3}]
[{1}]Danube University Krems, Austria; [{2}]Johannes Kepler Universität Linz, Austria; [{3}]Université de Bordeaux, France

11:15
A NOVEL MEMS-BASED PIEZOELECTRIC MULTI-MODAL VIBRATION ENERGY HARVESTER CONCEPT TO POWER AUTONOMOUS REMOTE SENSING NODES FOR INTERNET OF THINGS (IOT) APPLICATIONS
Jacopo Iannacci[{1}], Guido Sordo[{1}], Enrico Serra[{1}], Ulrich Schmid[{2}]
[{1}]Fondazione Bruno Kessler, Italy; [{2}]Technische Universität Wien, Austria

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10:00 - 11:15
C2L-C: MODELING AND SIMULATION OF NOVEL DEVICES
ROOM 203
SESSION CHAIRS: Sang-Seok Lee (Tottori University, Japan)
Deepak Uttamchandani (University of Strathclyde)

10:00
INVITED: MAGNETIC DOMAIN OBSERVATION OF STEPPED GIANT MAGNETO-IMPEDANCE SENSOR WITH SUBJECTING TO NORMAL MAGNETIC FIELD
Tomoo Nakai
Industrial Technology Institute, Miyagi Prefectural Government, Japan

10:30
ASYNCHRONOUS, ELECTROMAGNETIC SENSOR FUSION IN RATSLAM
Rafael Berkvens, Maarten Weyn, Herbert Peremans
Universiteit Antwerpen, Belgium

10:45
IMPROVED DROPLET SIZE STABILITY USING PHASE-GUIDE STRUCTURES
Stefan Clara[{1}], Ali Abdallah[{1}], Bernhard Jakoby[{1}], Mahmuda Akhtar[{2}], Michael J. Vellekoop[{2}]
[{1}]Johannes Kepler Universität Linz, Austria; [{2}]Universität Bremen, Germany

11:00
TOMOGRAPHY DEFINED AS SENSOR FUSION
Krikor Ozanyan
University of Manchester, United Kingdom

10:00 - 11:15
C2L-D: PHOTODIODES & PHOTODETECTORS BASED SENSORS I
ROOM 204
SESSION CHAIRS: Frederic Surre (City University London)
Byeongha Lee (Gwangju Institute of Science and Technology)

10:00
LOW TEMPERATURE, 400 °C, PURE BORON DEPOSITION: A SOLUTION FOR INTEGRATION OF HIGH-PERFORMANCE SI PHOTODETECTORS AND CMOS CIRCUITS
Vahid Mohammadi, Stoyan Nihtianov
Technische Universiteit Delft, Netherlands

10:15
PULSED TOF LASER RANGEFINDING WITH A 2D SPAD-TDC RECEIVER
Sahba Jahromi, Jussi-Pekka Jansson, Juha Kostamovaara
University of Oulu, Finland

10:30
A NOVEL BLUE-ENHANCED PHOTODETECTOR USING HONEYCOMB STRUCTURE
Javad Ghasemi{2}, Asif Chowdhury{1}, Alexander Neumann{2}, Bassem Fahs{1}, Mona Hella{1}, Steve Brueck{2}, Payman Zarkesh-Ha{2}
{1}Rensselaer Polytechnic Institute, USA; {2}University of New Mexico, USA

10:45
CONTINUOUS-WAVE TIME-OF-FLIGHT CMOS DETECTOR WITH COMMON-MODE FEEDBACK FOR STRONG BACKGROUND LIGHT APPLICATIONS
Hans Ingelberts, Robin Deleener, Sven Boulanger, Maarten Kuijk
Vrije Universiteit Brussel, Belgium

11:00
A HIGH EFFICIENCY UV-VIS ORGANIC PHOTODETECTOR BY AN INVERTED PTB7: PC71BM BULK HETEROJUNCTION STRUCTURE
Yan-Rung Lin{1}, Jung-Hao Chang{2}, Wei-Lun Tsai{2}, Chia-Hung Cho{1}, Hao-Wu Lin{2}
{1}Industrial Technology Research Institute, Taiwan; {2}National Tsing Hua University, Taiwan

10:00 - 11:00
C2L-E: APPLICATION AND ENERGY MANAGEMENT
ROOM 206
SESSION CHAIRS: Jafri Roozber
Walter Lang (Institute for Microsensors, University of Bremen)

10:00
POWER ALLOCATION IN SENSOR NETWORKS FOR SURVEILLING SECURITY ZONES
Gholamreza Alirezaei, Denise Cappel
Rheinisch-Westfälische Technische Hochschule Aachen, Germany

10:15
VIBRATION ENERGY HARVESTING AND MANAGEMENT FOR WIRELESS SENSOR NETWORKS IN BRIDGE STRUCTURAL MONITORING
Wei Liu[{1}], Zhengqiang Wang[{1}], Shaohua Qu[{1}], Rong Luo[{2}]
[{1}]Hubei University of Arts and Science, China; [{2}]Tsinghua University, China

10:30
RF ENERGY HARVESTER-BASED WAKE-UP RADIO
K Kaushik[{1}], Deepak Mishra[{1}], Swades De[{1}], Jun-Bae Seo[{1}], Soumya Jana[{2}], Kaushik Chowdhury[{3}], Stefano Basagni[{3}], Wendi Heinzelman[{4}]
[{1}]Indian Institute of Technology Delhi, India; [{2}]Indian Institute of Technology Hyderabad, India; [{3}]Northeastern University, USA; [{4}]University of Rochester, USA

10:45
ANALYSIS OF LOW ENERGY CONSUMPTION WIRELESS SENSOR WITH BLE
Zengtao Feng, Lingfei Mo, Meng Li
Southeast University, China

10:00 - 11:30
C2L-F: DEVICES/SYSTEMS I
ROOM 207
SESSION CHAIRS: Kenichi Takahata (University of British Columbia)
Svetlana Tatic-Lucic (Lehigh University USA)

10:00
INVITED: PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCERS FOR HUMAN-MACHINE INTERFACES AND BIOMETRIC SENSING
David Horsley[3], Ofer Rozen[3], Yipeng Lu[3], Stefon Shelton[1], Andre Guedes[1], Richard Przybyla[1], Hao-Yen Tang[2], Berhard Boser[2]
[1]Chirp Microsystems, USA; [2]University of California, Berkeley, USA; [3]University of California, Davis, USA

10:30
TACTILE AND PROXIMITY MEASUREMENT BY 3D TACTILE SENSOR USING SELF-CAPACITANCE MEASUREMENT
Satoshi Tsuji, Teruhiko Kohama
Fukuoka University, Japan

10:45
DESIGN AND MODELING OF 1000PPI FINGERPRINT SENSOR
Sheng-Miao Huang, Yu-Sheng Huang, Cheng-Nan Yeh, Norio Sugiura, Jhen-Yu You, Chien-Huan Peng
AU Optronics Corporation, Taiwan

11:00
AN INTEGRATED AND WEARABLE HEALTHCARE-ON-A-PATCH FOR WIRELESS MONITORING SYSTEM
Seok-Oh Yun[1], Moon-Keun Lee[1], Kyoung G. Lee[1], Jinsung Yi[2], Su Jeong Shin[1], MinHo Yang[1], Namho Bae[1], Tae Jae Lee[1], Jinho Ko[2], Seok Jae Lee[1]
[1]National NanoFab Center, Korea; [2]PHYCHIPS Inc., Korea

11:15
DESIGN OF A NOVEL MAGNETIC FIELD GENERATOR APPLIED IN DYNAMIC CHARACTERISTICS MEASUREMENT OF MAGNETO-DEPENDENT SENSORS
Yuan Tian, Zheng Qian, Xiaodong Zhao, Yongfu Deng
Beihang University, China

10:00 - 11:30
INDUSTRY TRACK I
ROOM 208

10:00
LOWER POWER, BATTERY OPERATED WIRELESS SENSING OPTIONS
Jim Philipp (Murata, USA)

10:45
WEARABLE LOW-POWER SENSORS
Veena Misra (NCSU/NSF – ASSIST, USA)

11:30 - 12:30
WEDNESDAY LUNCH & PANEL
GRAND BALLROOM

WEARABLE TECNOLOGIES
Moderator: Veena Misra (NCSU/NSF – ASSIST, USA)
Gerry Hayes (Wireless Center of NC, USA)
Brian Kim (RaonTech, Korea)
Younghyun Kim (Samsung Electronics, Korea)
Brian Carrigan (Smashing Boxes, USA)
Jan Svoboda (Firefly Solutions, USA)

12:30 - 14:00
C3P-G: SENSOR MODELING & CHARACTERIZATION III
ROOMS 101-110
SESSION CHAIR: Tayfun Akin (Middle East Technical University)

1-3
A THERMAL NETWORK MODEL FOR PIEZORESISTIVE PRESSURE SENSORS
Jan Lotichius[{2}], Timo Singer[{2}], Geert Brokmann[{1}], Hartmut Übensee[{1}], Thomas Ortlepp[{1}], Mario Kupnik[{2}], Roland Werthschützky[{2}]
[{1}]CiS Forschungsinstitut, Germany; [{2}]Technische Universität Darmstadt, Germany

1-6
RESEARCH ON RESPONSE TIME OF THERMOELECTRIC POWER SENSOR
Jiabin Yan, Xiaoping Liao, Zhenxiang Yi
Southeast University, China

1-9
3D MODEL OF THE THERMOELECTRIC MICROWAVE POWER SENSOR BY MEMS TECHNOLOGY
Zhenxiang Yi, Xiaoping Liao
Southeast University, China

1-12
MODELING MEMRISTIVE BIOSENSORS
Ioulia Tzouvadaki[{1}], Francesca Puppo[{1}], Marie-Agnès Doucey[{2}], Giovanni De Micheli[{1}], Sandro Carrara[{1}]
[{1}]École Polytechnique Fédérale de Lausanne, Switzerland; [{2}]Université de Lausanne, Switzerland

1-15
DETECTION OF UNGROUNDED OBJECTS ON MUTUAL CAPACITANCE TOUCH SCREENS
Christian Thoresen, Ulrik Hanke, Kjell Øvergård
Buskerud and Vestfold University College, Norway

1-18
DIFFERENTIAL CAPACITIVELY COUPLED CONTACTLESS CONDUCTIVITY DETECTION (DC4D) SENSOR FOR DETECTION OF OBJECT IN MICROFLUIDIC CHANNEL
Quang Loc Do[{2}], Tung Thanh Bui[{1}], Thi Thuy Ha Tran[{2}], Katsuya Kikuchi[{1}], Masahiro Aoyagi[{1}], Trinh Chu Duc[{2}]
[{1}]National Institute of Advanced Industrial Science and Technology, Japan; [{2}]Vietnam National University, Vietnam

12:30 - 14:00
C3P-H: METAL OXIDE BASED GAS SENSORS
ROOMS 101-110
SESSION CHAIR: Inkyu Park (KAIST)

2-25
NEAR REAL-TIME RECONSTRUCTION OF 2D SOIL GAS DISTRIBUTION FROM A REGULAR NETWORK OF LINEAR GAS SENSORS
Patrick Neumann[{1}], Matthias Bartholmai[{1}], Detlef Lazik[{2}]
[{1}]Federal Institute for Materials Research and Testing, Germany;
[{2}]Helmholtz Centre for Environmental Research, Germany

2-28
ROOM TEMPERATURE SENSING PERFORMANCE OF GRAPHENE-LIKE SNS2 TOWARDS AMMONIA
Hao Wang, Keng Xu, Dawen Zeng
Huazhong University of Science and Technology, China

2-31
[6,6]-PHENYL C61 BUTYRIC ACID METHYL ESTER/ALPHA-SEXITHIOPHENE HETERO-JUNCTION THIN FILM TRANSISTORS GAS SENSORS FOR AMMONIA DETECTION
Yuyan Chen, Guangzhong Xie, Tao Xie, Hongfei Du, Qiuping Zhang, Yuanjie Su, Yadong Jiang
University of Electronic Science and Technology of China, China

2-34
AMORPHOUS INDIUM GALLIUM ZINC OXIDE THIN FILM-BASED OZONE SENSORS
Chiu-Hsien Wu, Guo-Jhen Jiang, Kai-Wei Chang, Zu-Yin Deng, Kuen-Lin Chen
National Chung Hsing University, Taiwan

2-37
FAST RESPONSE OF PULSED LASER DEPOSITED ZNFE2O4 THIN FILM AS A CHEMO-RESISTIVE GAS SENSOR
Saptarshi De, Narayanan Venkataramani, Rajiv Dusane, Shiva Prasad
Indian Institute of Technology Bombay, India

2-40
DETECTION OF SEASONAL ALLERGIC RHINITIS FROM EXHALED BREATH VOCS USING AN ELECTRONIC NOSE BASED ON AN ARRAY OF CHEMICAL SENSORS
Tarik Saidi[{1}], Khalid Tahri[{1}], Nezha El Bari[{1}], Radu Ionescu[{3}], Benachir Bouchikhi[{2}]
[{1}]Moulay Ismaïl University, Morocco; [{2}]Moulay Ismaïl University / Sensor Electronic & Instrumentation Group, Morocco; [{3}]Rovira i Virgili University, Spain

2-42
DOPAMINE SENSING UPON AMPHETAMINE ADMINISTRATION
Tanmay A. Kulkarni, Deepa Gupta, Dan Covey, Joseph Cheer, Gymama Slaughter
University of Maryland Baltimore County, USA

2-44
AN EXPERIMENTAL STUDY OF 3D ODOR PLUME TRACKING USING MULTICOPTER WITH GAS SENSOR ARRAY
Shinji Tanaka, Yoshinori Takei, Kazuki Hirasawa, Hidehito Nanto
Kanazawa Institute of Technology, Japan

2-46
HIGH-SENSITIVITY PARAMETRICALLY AMPLIFIED CHEMO-MECHANICAL VAPOR SENSORS
Shashank Pandey, Niladri Banerjee, Aishwaryadev Banerjee, Nazmul Hasan, Hanseup Kim, Carlos Mastrangelo
University of Utah, USA

2-48
THIN FILM ZINC OXIDE GAS SENSOR VIA NEAR-FIELD ELECTROSPRAY
Jianyi Zheng, Weiwei Huang, Lingling Sun, Jiaxin Jiang, Gaofeng Zheng, Daoheng Sun
Xiamen University, China

2-50
ROOM TEMPERATURE ALCOHOL SENSORS BASED ON PANI/MWCNT COMPOSITE THIN FILM
Rawat Jaisutti[{2}], Kalya Eaiprasertsak[{2}], Tanakorn Osotchan[{1}]
[{1}]Mahidol University, Thailand; [{2}]Thammasat University, Thailand

2-52
EFFECTS OF POST-THERMAL ANNEALING ON THE PERFORMANCE CHARACTERISTICS OF PD/GAN SCHOTTKY DIODES HYDROGEN SENSORS
Youngran Choi, Hyunsoo Kim
Chonbuk National University, Korea

2-54
ROOM TEMPERATURE GAS SENSING WITH POTASSIUM TITANATE NANOWIRES
Igor Burmistrov[{2}], Alexey Varezhnikov[{2}], Vyacheslav Musatov[{2}], Andrey Lashkov[{2}], Alexander Gorokhovsky[{2}], Tatyana Yudinceva[{1}], Victor Sysoev[{1}]
[{1}]Saratov State Technical University, Russia; [{2}]Yuri Gagarin State Technical University of Saratov, Russia

12:30 - 14:00
C3P-J: BIOSENSORS III
ROOMS 101-110
SESSION CHAIR: Sangmin Jeon (POSTECH Pohang University of Science and Technology)

3-57
DIRECT PARTIAL CH3 TERMINATION INTO CARBOXYL TERMINATED DIAMOND SURFACE FOR BIOSENSOR
Evi Suaebah, Takuro Naramura, Hiroshi Kawarada
Waseda University, Japan

3-60
FABRICATION OF FERROCENE MODIFIED MICROSENSORS FOR THE SENSITIVE DETECTION OF GLUTAMATE
Tina T.-C. Tseng, Peter W.-H. Chen, Lewis H.-Y. Chang
National Taiwan University of Science and Technology, Taiwan

3-63
DEVELOPMENT OF A REAL-TIME QCM BOND-RUPTURE SYSTEM FOR POCT APPLICATIONS
Yong Yuan[{2}], Kui Han[{1}]
[{1}]Nanjing Haida Molecular Diagnostics Ltd, China; [{2}]Southwest Jiaotong University, China

3-66
PATTERNING AN ENZYME-MEMBRANE OF BIO-IMAGE SENSOR USING LITHOGRAPHY TECHNIQUE
You-Na Lee, Tomoko Horio, Koichi Okumura, Tatsuya Iwata, Kazuhiro Takahashi, Makoto Ishida, Kazuaki Sawada
Toyohashi University of Technology, Japan

3-69
HIGH SENSITIVITY RARE CELL CAPTURING BIOCHIP WITH SEPARABLE MICROSTRUCTURES
Okju Kim, Daewon Lee, Amose Chungwon Lee, Sunghoon Kwon
Seoul National University, Korea

3-72
SENSING AND QUANTIFICATION OF SALIVARY BETA-AMYLOID PEPTIDES AND PROTEIN SEQUENCING FOR THE SALIVA OF NORMAL AND AD PATIENTS
Ki Bong Song, Chang-Bum Kim, Yo-Han Choi
Electronics and Telecommunications Research Institute, Korea

3-75
CHEMOSTAT-LIKE MICROFLUIDIC PLATFORM FOR HIGHLY SENSITIVE DETECTION OF HEAVY METAL IONS USING MICROBIAL BIOSENSORS
Ji Won Lim{2}, Minseok Kim{2}, Sung Kuk Lee{2}, Taesung Kim{2}, Hyun Ju Kim{1}, Sang Jun Lee{1}
{1}Korea Research Institute of Bioscience and Biotechnology, Korea; {2}Ulsan National Institute of Science and Technology, Korea

3-78
DEVELOPMENT OF INTEGRATED FLEXIBLE PENETRATING MICROELECTRODE ARRAY WITH INTERCONNECTION CABLE FOR USE IN VARIOUS NERVOUS SYSTEMS
Donghak Byun, Keonghwan Oh, Sohee Kim
Gwangju Institute of Science and Technology, Korea

3-81
MICROFLUIDIC PAPER-BASED PRECONCENTRATOR BASED ON ION CONCENTRATION POLARIZATION
Sung Il Han{2}, Rhokyun Kwak{1}, Ki-Back Lee{2}, Yong Kyoung Yoo{2}, Junwoo Lee{2}, Cheonjung Kim{2}, Kyo Seon Hwang{1}, Jeong Hoon Lee{2}
{1}Korea Institute of Science and Technology, Korea; {2}Kwangwoon University, Korea

3-84
NEW COPOLYMER BRUSHES FOR LABEL-FREE AFFINITY BIOSENSORS
Eduard Brynda{1}, Frantisek Surman{1}, Cesar Rodriguez-Emmennegger{1}, Tomas Riedel{1}, Hana Lisalova Vaisocherova{2}
{1}Academy of Sciences of the Czech Republic, Czech Rep.; {2}Institute of Photonics and Electronics, Academy of Sciences CR, v.v.i., Czech Rep.

12:30 - 14:00
C3P-K: OPTICAL SENSORS III
ROOMS 101-110
SESSION CHAIR: Jeong Bong Lee (University of Texas at Dallas)

4-88
HIGH-THROUGHPUT AND REAL-TIME MICROALGAE MONITORING PLATFORM USING LENS-FREE SHADOW IMAGING SYSTEM (LSIS)
Dongmin Seo{3}, Mohendra Roy{3}, Jaewoo Kim{3}, Kiyoung Ann{3}, Yongha Hwang{3}, Yeon Hwa Kwak{1}, Sangwoo Oh{2}, Moonjin Lee{2}, Jae Woo Lee{3}, Sungkyu Seo{3}
{1}Korea Electronics Technology Institute, Korea; {2}Korea Research Institute of Ships and Ocean Engineering, Korea; {3}Korea University, Korea

4-91
GE1-XSNX/GE HETEROSTRUCTURE INFRARED PHOTODETECTOR
Khurelbaatar Zagarzusem[1], Yeon-Ho Kil[1], Sim-Hoon Yuk[1], Taek Sung Kim[2], Zumuukhorol Munkhsaihan[1], Chel-Jong Choi[1], Kyu-Hwan Shim[1]
[1]Chonbuk National University, Korea; [2]Kunsan National University, Korea

4-94
TIME-RESOLVED DETECTION OF X-RAY GENERATED PULSES ON COPLANAR STRIPLINE SENSORS
Stephen Durbin[2], Aamer Mahmood[3], David Lubelski[2], Bernhard Adams[1]
[1]Argonne National Laboratory, USA; [2]Purdue University, USA; [3]Qatar Environment & Energy Research Institute, Qatar

4-97
FIBER OPTIC REFRACTOMETER BASED IN MULTIMODE INTERFERENCE EFFECTS (MMI) USING INDIUM TIN OXIDE (ITO) COATING
Adolfo Rodríguez-Rodríguez[2], René Domínguez-Cruz[2], Daniel May-Arrioja[1], Ignacio R. Matías-Maestro[3], Francisco Javier Arregui[3], Carlos Ruiz-Zamarreño[3]
[1]Centro de Investigaciones en Óptica, Spain; [2]Universidad Autonoma de Tamaulipas, Mexico; [3]Universidad Pública de Navarra, Spain

4-100
ROOM TEMPERATURE DEPOSITION OF HIGHLY SENSITIVE VANADIUM OXIDE FILMS FOR INFRARED LIGHT SENSING APPLICATIONS
Siamack Vosoogh Grayli, Ibrahim El-Chami, Behraad Bahreyni, Gary Leach
Simon Fraser University, Canada

4-103
UTILIZING NEW ERBIUM-DOPED FIBER LASER SCHEME FOR LONG-DISTANCE FIBER BRAGG GRATING (FBG) SENSOR SYSTEM
C. H. Yeh[1], Z. H. Chen[1], J. Y. Chen[1], C. W. Chow[2]
[1]Feng Chia University, Taiwan; [2]National Chiao Tung University, Taiwan

13-250
MODE-SWITCHING VCO AND DOUBLE BALANCED MIXER IN OPTICAL COMMUNICATION AND SENSOR APPLICATION
Wen Cheng Lai, Sheng-Lyang Jang, Ching-Wen Hsue
National Taiwan University of Science and Technology, Taiwan

12:30 - 14:00
C3P-L: MECHANICAL, MAGNETIC & PHYSICAL SENSORS III
ROOMS 101-110
SESSION CHAIR: Ulrich Schmid (Vienna University of Technology)

5-155
MASH2-0 ELECTROMECHANICAL SIGMA-DELTA MODULATOR FOR CAPACITIVE MEMS SENSORS WITH DIGITAL FILTER CALIBRATION USING SIMULATED ANNEALING
Bader Almutairi[{1}], Ali Alshehri[{1}], Michael Kraft[{2}]
[{1}]King Abdulaziz City for Science and Technology, Saudi Arabia; [{2}]Université de Liège, Belgium

5-108
OPTIMIZATION OF A BIO-INSPIRED SOUND LOCALIZATION SENSOR FOR HIGH DIRECTIONAL SENSITIVITY
Andrew Reid, Deepak Uttamchandani, James F.C. Windmill
University of Strathclyde, United Kingdom

5-112
A NOVEL FLEXOGRAPHIC PRINTED STRAIN GAUGE ON PAPER PLATFORM
Dinesh Maddipatla[{2}], Binu Baby Narakathu[{2}], Sai Guruva Reddy Avuthu[{2}], Sepehr Emamian[{2}], Ali Eshkeiti[{2}], Amer Abdulmahdi Chlaihawi[{2}], Bradley Bazuin[{2}], Margaret Joyce[{2}], Christie Wong Barrett[{1}], Massood Zandi Atashbar[{2}]
[{1}]Mac Arthur Corporation, USA; [{2}]Western Michigan University, USA

5-116
MEASUREMENT OF 3-D VIBRATION BY DYNAMIC PHOTOGRAMMETRY USING LEAST-SQUARE IMAGE MATCHING FOR SUB-PIXEL TARGETING
Hyoseong Lee[{3}], Huinam Rhee[{3}], Jae-Hong Oh[{1}], Jin-Ho Park[{2}]
[{1}]Chonnam National University, Korea; [{2}]Korea Atomic Enery Research Institute, Korea; [{3}]Sunchon National University, Korea

5-120
A FLEXIBLE STRAIN-GAUGE SENSOR FOR FLEXIBLE INPUT DEVICES
Yeon Hwa Kwak[{1}], Sungkyu Seo[{2}], Kunnyun Kim[{1}]
[{1}]Korea Electronics Technology Institute, Korea; [{2}]Korea University, Korea

5-124
DESIGN AND FABRICATION OF BUCKLED METAL STRAIN GAUGES USING SHAPE MEMORY POLYMER AND INKJET ADDITIVE MICROFABRICATION
Robert Roberts, Sheng Zeng, Norman Tien
University of Hong Kong, Hong Kong

5-128
DESIGN AND FABRICATION OF INDIVIDUALIZED CAPACITIVE MICROSENSOR FOR TILT MEASUREMENT
Cyril Baby Karuthedath, Norbert Schwesinger
Technische Universität München, Germany

5-132
UNDERWATER OBSERVATION OF VIBRATION BEHAVIOR OF THE MINIATURE CIRCULAR PIEZOELECTRIC MICROMACHINED ULTRASONIC TRANSDUCERS
Daisuke Akai, Makoto Ishida, Daisuke Takashima
Toyohashi University of Technology, Japan

5-136
HIGHLY FLEXIBLE AND SENSITIVE GRAPHENE-SILVER NANOCOMPOSITE STRAIN SENSOR
Nagarjuna Neella, Venkateswarlu Gaddam, Konandur Rajanna, M.M. Nayak, Talabattulla Srinivas
Indian Institute of Science, India

6-140
PVDF BASED ARTIFICIAL CANAL LATERAL LINE FOR UNDERWATER DETECTION
Jianchao Fu, Yonggang Jiang, Deyuan Zhang
Beihang University, China

13-253
SKIN FORCE SENSOR USING PIEZORESISTIVE PEDOT:PSS WITH ARABITOL ON FLEXIBLE PDMS
Mengying Xie, Kean Aw, Wei Gao
University of Auckland, New Zealand

13-256
HIGH TEMPERATURE PRESSURE SENSOR USING CU-SN WAFER LEVEL BONDING
Guandong Liu, Chengchen Gao, Y.X Zhang, Yilong Hao
Peking University, China

12:30 - 14:00
C3P-M: SENSOR APPLICATIONS
ROOMS 101-110
SESSION CHAIR: Sang-Seok Lee (Tottori University, Japan)

6-144
HIGH-SPEED SENSING OF SOFTNESS DURING GRASPING PROCESS BY ROBOT HAND EQUIPPED WITH TACTILE SENSOR
Yugo Katsuki[2], Yuji Yamakawa[2], Masatoshi Ishikawa[2], Makoto Shimojo[1]
[1]University of Electro-Communications, Japan; [2]University of Tokyo, Japan

6-148
DEVELOPMENT OF AN ACTUATION SYSTEM FOR A ROTARY HYDRAULIC BRAKE ON A LOW COST LIGHT WEIGHT KNEE-ANKLE-FOOT ORTHOSIS
Murray Lawn[2], Makoto Takashima[2], Makoto Ninomiya[1], Jiangli Yu[2], Kayano Soma[2], Takakazu Ishimatsu[2]
[1]Nagasaki Kanae Co.Ltd, Japan; [2]Nagasaki University, Japan

12:30 - 14:00
C3P-N: SENSOR NETWORK AND APPLICATION III
ROOMS 101-110
SESSION CHAIR: Ryutaro Maeda (AIST)

7-159
ENERGY EFFICIENT ROUTING SCHEME USING LEADER ELECTION IN AMBIENT ENERGY HARVESTING WIRELESS AD-HOC AND SENSOR NETWORKS
Md. Enam Haque, Uthman Baroudi
King Fahd University of Petroleum and Minerals, Saudi Arabia

7-164
DISTANCE CONTROL BETWEEN MULTIPLE DRONES FOR STABLE COMMUNICATION
Riho Motooka[2], Takeru Katagiri[1], Shintaro Murayama[2], Junji Takahashi[2], Yoshito Tobe[2], Ryo Nishikawa[2]
[1]Aoyama Gakuin University, Japan; [2]Aoyama Gakun University, Japan

7-169
DEPLOYMENT ALGORITHMS FOR COVERAGE IMPROVEMENT IN A NETWORK OF MOBILE SENSORS WITH MEASUREMENT ERROR IN THE PRESENCE OF OBSTACLES
Hamid Mahboubi, Fabrice Labeau
McGill University, Canada

7-171
TRAFFIC DEDUCTION EXPLORING SENSOR DATA'S INTRA-CORRELATIONS IN TRAIN TRACK MONITORING WSN
Zhi Liu, Toshitaka Tsuda, Hiroshi Watanabe
Waseda University, Japan

7-173
COMPACT WIRELESS SENSOR NETWORK FOR WEB AND MOBILE APPLICATIONS
Dongyu Wang, Kazunori Sugiura
Keio University, Japan

13-259
COMPARATIVE ANALYSIS OF A CONTENTION BASED (RI-MAC) AND TDMA BASED (ATMA) MAC PROTOCOLS FOR WIRELESS SENSOR NETWORKS
Trilok Chand, Arvind Kakria
PEC University of Technology, India

13-262
DESIGN AND IMPLEMENTATION OF A CONNECTED FARM FOR SMART FARMING SYSTEM
Minwoo Ryu, Jaeseok Yun, Ting Miao, Il-Yeup Ahn, Sung-Chan Choi, Jaeho Kim
Korea Electronics Technology Institute, Korea

12:30 - 14:00
C3P-P: (BIO-)CHEMICAL AND GAS SENSING APPLICATIONS
ROOMS 101-110
SESSION CHAIR: Siyang Zheng (Penn State University)

8-179
CAPACITOR CHARGING USING ALUMINUM/PHOSPHATE-BASED CELL
Gymama Slaughter, Joshua Sunday, Tanmay A. Kulkarni
University of Maryland Baltimore County, USA

8-181
DYNAMICAL THRESHOLD SETTING METHOD USING OUTLIER REJECTION TEST FOR SENSOR REACTION DETECTION
Kazuki Hirasawa[{1}], Rika Takahashi[{1}], Yoshinori Takei[{1}], Hidehito Nanto[{1}], Atsushi Saitoh[{2}]
[{1}]Kanazawa Institute of Technology, Japan; [{2}]Shibaura Institute of Technology, Japan

8-186
FLUIDICS-BASED PLANT STUDY PLATFORM WITH COLORIMETRIC HUMIDITY MONITORING
Satya Achanta, Sanghan Park, Chang-Soo Kim
Missouri University of Science and Technology, USA

8-190
SMART CHAIR BASED ON MULTI HEART RATE DETECTION SYSTEM
Byeong Gu Ahn, Yun Hong Noh, Do Un Jeong
Dongseo University, Korea

8-194
PHOTOPLETHYSMOGRAPHY AS A FORM OF BIOMETRIC AUTHENTICATION
Anthony Lee, Younghyun Kim
Samsung Electronics, Korea

8-198
ROBOTIC GAS SOURCE LOCALIZATION ASSISTED BY ACTIVE AIRFLOW GENERATION
Ayano Murai, Kamon Yoshimoto, Ryuichi Takemura, Haruka Matsukura, Hiroshi Ishida
Tokyo University of Agriculture and Technology, Japan

8-202
EXPERIMENTAL VALIDATION OF MOUSE EEG SENSOR THROUGH THE ANALYSIS OF VISUALLY EVOKED POTENTIAL ELICITED BY SUCCESSIVE FLASH STIMULI
Donghyeon Kim, Chanmi Yeon, Euiheon Chung, Kiseon Kim
Gwangju Institute of Science and Technology, Korea

8-206
3D MULTI-FUNCTION BIO-SPHERE DROSOPHILA BEHAVIOR PLATFORM
Hao-Yu Liang, Wei-Cheng Lai, Pei-Hsuan Lo, Weileun Fang
National Tsing Hua University, Taiwan

8-209
IMPLEMENTATION OF WIDE RANGE SOIL MOISTURE PROFILE PROBE BY COPLANAR PLATE CAPACITOR ON FILM SUBSTRATE
Yasutomo Shirahama, Ryo Shigeta, Yoshihiro Kawahara, Tohru Asami, Yuki Kojima, Kazuhiro Nishioka
University of Tokyo, Japan

8-211
ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY FOR IN SITU MONITORING OF EARLY ZEOLITE FORMATION
Gert Brabants[{2}], Erwin Konrad Reichel[{1}], Ali Abdallah[{1}], Francis Taulelle[{3}], Christine Kirschhock[{3}], Johan Martens[{3}], Bernhard Jakoby[{1}]
[{1}]Johannes Kepler Universität Linz, Austria; [{2}]Johannes Kepler Universität Linz & Katholieke Universiteit Leuven, Austria; [{3}]Katholieke Universiteit Leuven, Belgium

12:30 - 14:00
C3P-Q: INTERFACE CIRCUITS
ROOMS 101-110
SESSION CHAIR: Zheyao Wang (Tsinghua University, Peking)

13-264
A CMOS BEOL ACCELEROMETER LOW-NOISE READOUT AMPLIFIER WITH 4.2 ZF/RT-HZ TOTAL NOISE FLOOR
Josep Maria Sánchez-Chiva[{2}], Piotr Michalik[{2}], Daniel Fernández[{1}], Jordi Madrenas[{2}]
[{1}]Nanusens / Universitat Politècnica de Catalunya, Spain; [{2}]Universitat Politècnica de Catalunya, Spain

13-266
THEORETICAL ANALYSIS AND SIMULATION OF SU-8 MICRONEEDLES FOR EFFECTIVE SKIN PENETRATION AND DRUG DELIVERY
Richa Mishra, Tarun Kanti Bhattacharyya, Tapas Kumar Maiti
Indian Institute of Technology, Kharagpur, India

13-268
SIMPLE AND EFFICIENT INTERFACE CIRCUIT FOR VIBRATION ELECTROSTATIC ENERGY HARVESTERS
Jie Wei[{2}], Sarah Risquez[{2}], Hervé Mathias[{2}], Elie Lefeuvre[{2}], François Costa[{1}]
[{1}]Université Paris-Est / CNRS, France; [{2}]Université Paris-Sud / CNRS, France

13-270
BIRDCAGE TYPE NMR RECEIVER COIL SENSOR WITH INTEGRATED DETUNING CIRCUIT FOR 3T MRI SYSTEM
Sheikh Faisal Ahmad, Young Cheol Kim, Ick Chang Choi, Hyun Deok Kim
Kyungpook National University, Korea

13-272
A LOW-POWER INTEGRATED CIRCUIT FOR INTERFACING A CAPACITIVE MICROMACHINED ULTRASONIC TRANSDUCER (CMUT) BASED RESONANT GAS SENSOR
Mohit Kumar, Chunkyun Seok, Marzana Mantasha Mahmud, Xiao Zhang, Omer Oralkan
North Carolina State University, USA

13-274
INDUCTIVE SENSING TECHNIQUE FOR LOW POWER IMPLANTABLE HYDROGEL-BASED BIOCHEMCIAL SENSORS
Yuechuan Yu, Vishal Bhola, Prashant Tathireddy, Darrin Young, Shad Roundy
University of Utah, USA

12:30 - 14:00
C3P-R: OPEN POSTERS
SPECIAL POSTERS

15-214
SOOT-PARTICULATE MATTER SENSOR USING PT-GAN SCHOTTKY CONTACTS AT HIGH TEMPERATURES
Hongyun So, Minmin Hou, Sambhav Jain, Jongwoo Lim, Debbie Senesky
Stanford University, USA

15-217
SURFACE DOPING OF LA IONS INTO ZNO NANOCRYSTALS TO LOWER THE OPTIMAL WORKING TEMPERATURE FOR HCHO SENSING PROPERTIES
Shouqin Tian{2}, Neng Li{2}, Dawen Zeng{1}, Xiujian Zhao{2}
{1}Huazhong University of Science and Technology, China; {2}Wuhan University of Technology, China

15-220
GAS SENSING CHARACTERISTICS OF NANOSTRUCTURED METAL OXIDE COATINGS PRODUCED BY ULTRASHORT PULSED LASER DEPOSITION
Ville Kekkonen{1}, Christine Alepee{3}, Jari Liimatainen{1}, Fergus Clarke{1}, Tilman Sauerwald{2}, Andreas Schuetze{2}
{1}Picodeon Oy Ltd, Finland; {2}Saarland University, Germany; {3}SGX Sensortech AG, Switzerland

15-223
ZERO POWER SENSOR NETWORK - A FULLY PASSIVE WIRELESS SENSING PLATFORM
Colm Mc Caffrey, Nadine Pesonen, Jacek Flak, Pekka Pursula
VTT - Technical Research Centre of Finland, Finland

15-226
INDOOR SNOWFALL SIMULATION CHAMBER FOR THE PERFORMANCE EVALUATION OF VISION-BASED SAFETY SENSORS
Bong Keun Kim, Yasushi Sumi
AIST, Japan

15-229
BIOMIMICKING GRAPHENE MECHANORECEPTOR
Onejae Sul{2}, Eunseok Choi{2}, Hongjun Kim{1}, Kyumin Kim{2}, Juyoung Kim{2}, Seung-Beck Lee{2}
{1}Hanyang Univeristy, Korea; {2}Hanyang University, Korea

15-232
FABRICATION AND MEASUREMENT OF ARTIFICIAL COCHLEAR DEVICE
Jun-Hyuk Kwak, Youngdo Jung, Shin Hur
KIMM, Korea

15-235
SIMULATION OF IMPROVED SENSITIVITY OF WHISPERING GALLERY MODES SENSOR BY NANO STRUCTURE CHIP
Tae Young Kang, Kyujung Kim
Pusan National University, Korea

15-238
SIGNAL ACQUISITION USING THE SERIAL SEARCH METHOD FOR MOVING TARGETS ON INDOOR POSITIONING SYSTEM USING SPREAD SPECTRUM ULTRASONIC WAVES
Yasuaki Miyara, Taketoshi Iyota
Soka University, Japan

15-241
HIGHLY SENSITIVE AND SELECTIVE MULTI-CHANNEL CHEMIRESISTIVE ELECTRONIC NOSE
Hi Gyu Moon, Soo Deok Han, Youngmo Jung, Chulki Kim, Taikjin Lee, Seok Lee, Jin-Sang Kim, Hyung-Ho Park, Chong-Yun Kang
KIST, Korea

15-243
PH SENSITIVITY COMPARISON BETWEEN INVERSION AND DEPLETION MODE SILICON NANOWIRE FIELD-EFFECT TRANSISTOR (SI-NWFET)
Sung Keun Yoo, Jin-Hee Moon, In-Ho Song, Jin-Won Kim, Seung-A Lee, Ha-Chul Jung, Dong-Jun Moon
Osong Medical Innovation Foundation, Korea

15-245
NANOSTRUCTURAL VANADIUM DIOXIDE THIN FILM BY GLANCING ANGLE DEPOSITION FOR THERMAL BIOSENSOR APPLICATION
Soo Deok Han{1}, Bo Yun Kim{2}, Dong Ha Kim{2}, Hi Gyu Moon{1}, Jin Sang Kim{1}, Sahn Nahm{2}, Chong Yun Kang{1}
{1}Korea Institute of Science and Technology, Korea; {2}Korea University, Korea

15-247
NEW STUDY OF SEMICONDUCTOR LASER UNDER OPTICAL FEEDBACK WITH HIGH SPEED MODULATION OF THE EXTERNAL CAVITY
Laura Le Barbier{2}, Han-Cheng Seat{3}, Olivier Bernal{3}, Jérôme Luc{1}, Thierry Bosch{3}
{1}CEA, France; {2}CEA - LAAS-CNRS, France; {3}LAAS-CNRS INPT, France

14:00 - 15:30
C4L-A: FABRICATION/TECHNOLOGY I
ROOM 201
SESSION CHAIRS: Lina Sarro (Delft University of Technology)
Wen Li (Michigan State University)

14:00
INVITED: ADVANCED CONFORMAL PARYLENE FABRICATION FOR MICRO/NANO DEVICES
Wei Wang[2], Yaoping Liu[2], Dongyang Kang[1], Lingqian Zhang[2], Yu-Chong Tai[1]
[1]California Institute of Technology, USA; [2]Peking University, China

14:30
EMBEDDED SACRIFICIAL LAYERS FOR CMUT FABRICATION
Rupak Bardhan Roy[1], Ayhan Bozkurt[1], Omid Farhanieh[1], A Sanli Ergun[2]
[1]Sabanci University, Turkey; [2]TOBB University of Economics and Technology, Turkey

14:45
DIRECTED GROWTH OF METAL NANOPARTICLES ON SUBSTRATES BY POLARIZED LIGHT IRRADIATION
Masashi Watanabe, Satoshi Araki, Kenshi Hayashi
Kyushu University, Japan

15:00
PIEZOELECTRIC STRAIN SENSOR ARRAY FABRICATED BY TRANSFER PRINTING METHODS
Takahiro Yamashita, Seiichi Takamatsu, Hironao Okada, Toshihiro Itoh, Takeshi Kobayashi
National Institute of Advanced Industrial Science and Technology, Japan

15:15
MOS2 NANOSENSORS FABRICATED BY DIELECTROPHORETIC ASSEMBLY FOR ULTRASENSITIVE AND RAPID SENSING OF VOLATILE ORGANIC COMPOUNDS
Shih-Pang Wang, Chung-Hsuan Wu, Chien-Chong Hong
National Tsing Hua University, Taiwan

14:00 - 15:30
C4L-B: TACTILE SENSORS & SMART SKIN
ROOM 202
SESSION CHAIRS: Kwang-Seok Yun (Sogang University)
Larisa Florea (Dublin City University)

14:00
BIOMIMETIC MAGNETIC NANOCOMPOSITE FOR SMART SKINS
Ahmed Alfadhel, Jurgen Kosel
King Abdullah University of Science and Technology, Saudi Arabia

14:15
A FLEXIBLE TACTILE SENSOR FOR DISTRIBUTED-DEFLECTION DETECTION AND ITS RADIAL ARTERY MEASUREMENT
Jiayue Shen, Dan Wang, Zhili Hao
Old Dominion University, USA

14:30
UNIVERSAL DOUBLE-SPATIAL-RESOLUTION SOLUTION FOR CAPACITIVE TACTILE SENSORS
Mochtar Chandra, Rongshun Chen, Cheng-Yao Lo
National Tsing Hua University, Taiwan

14:45
PIEZOELECTRIC PVDF THIN FILMS WITH ASYMMETRIC MICROPOROUS STRUCTURES FOR PRESSURE SENSING
Dajing Chen, Muyue Hang, Kaina Chen, Kristopher Brown, John Zhang
Dartmouth College, USA

15:00
SILVER NANOWIRE STRAIN SENSORS FOR WEARABLE BODY MOTION TRACKING
Shanshan Yao[{1}], Jeong Seok Lee[{2}], K'ehleyr James[{1}], Jace Miller[{3}], Venkataramana Narasimhan[{3}], Andrew Dickerson[{3}], Xu Zhu[{4}], Yong Zhu[{1}]
[{1}]North Carolina State University, USA; [{2}]Samsung Electronics, Korea; [{3}]Samsung Electronics America, Inc., USA; [{4}]Samsung Research America, USA

15:15
FULLY PRINTED AND FLEXIBLE PIEZOELECTRIC BASED TOUCH SENSITIVE SKIN
Sepehr Emamian, Sai Guruva Reddy Avuthu, Binu Baby Narakathu, Ali Eshkeiti, Amer Abdulmahdi Chlaihawi, Bradley Bazuin, Margaret Joyce, Massood Zandi Atashbar
Western Michigan University, USA

14:00 - 15:30
C4L-C: THEORY AND NEW APPROACH
ROOM 203
SESSION CHAIRS: Takahiro Yamashita (AIST)
Gijs Krijnen (University of Twente)

14:00
GAME THEORETIC APPROACH TOWARDS ENERGY-EFFICIENT TASK DISTRIBUTION IN WIRELESS SENSOR NETWORKS
Mo Haghighi, Konstantinos Maraslis, Theo Tryfonas, George Oikonomou
University of Bristol, United Kingdom

14:15
ENERGY EFFICIENT WEIGHTED SAMPLING MATRIX BASED CS TECHNIQUE FOR WSN
R Monika, R Hemalatha, S Radha
SSN College of Engineering, India

14:30
IMPROVING SENSOR-FUSION WITH ENVIRONMENTAL MODELS
Goncalo Jesus{1}, Anabela Oliveira{1}, Alberto Azevedo{1}, Antonio Casimiro{2}
{1}Laboratório Nacional de Engenharia Civil, Portugal; {2}Universidade de Lisboa, Portugal

14:45
ARMAC: ADAPTIVE RMAC, A MEDIUM ACCESS CONTROL PROTOCOL FOR WIRELESS SENSOR NETWORKS
Jenifar Rahman, Shamim Ara Shawkat, Mohammad Shah Alam
Bangladesh University of Engineering and Technology, Bangladesh

14:00 - 15:30
C4L-D: PHOTODIODES & PHOTODETECTORS BASED SENSORS II
ROOM 204
SESSION CHAIRS: Jeong Bong Lee (University of Texas at Dallas)
Yan-Rung Lin (Industrial Technology Research Institute)

14:00
AN ULTRAVIOLET RADIATION SENSOR USING DIFFERENTIAL SPECTRAL RESPONSE OF SILICON PHOTODIODES
Yhang Ricardo Sipauba Carvalho Da Silva, Yasumasa Koda, Satoshi Nasuno, Rihito Kuroda, Shigetoshi Sugawa
Tohoku University, Japan

14:15
IMPROVED PHOTO RESPONSE OF HYBRID ZNO/P3HT BILAYERED PHOTO DIODE
Anubha Bilgaiyan, Tejendra Dixit, Iyamperumal Anand Palani, Vipul Singh
Indian Institute of Technology Indore, India

14:30
ORGANIC PHOTODETECTORS WITH ACTIVE LAYER PATTERNED BY LITHOGRAPHY
Pawel Malinowski, Epimitheas Georgitzikis, Caterin Salas Redondo, David Cheyns, Soeren Steudel, Sarah Schols, Paul Heremans
imec, Belgium

14:45
X-RAY DETECTORS BASED ON P+-SI/N-ZNO ABRUPT HETEROJUNCTIONS
Xiaolong Zhao[{2}], Yongning He[{2}], Liang Chen[{1}], Jinliang Liu[{1}], Yang Ouyang[{1}]
[{1}]Northwest Institute of Nuclear Technology, China; [{2}]Xi'an Jiaotong University, China

15:00
HIGH-SPEED GATED CMOS DETECTOR FOR FLUORESCENCE LIFETIME MICROSCOPY EXTENDING TO NEAR-INFRARED WAVELENGTHS
Hans Ingelberts, Maarten Kuijk
Vrije Universiteit Brussel, Belgium

15:15
IMPROVING THE RELIABILITY OF CARBON NANOTUBE BASED INFRARED SENSORS
Liangliang Chen, Ning Xi, Zhanxin Zhou, Bo Song, Yongliang Yang, Yujie Hao, Zhiyong Sun
Michigan State University, USA

14:00 - 15:30
C4L-E: ENERGY & POWER SYSTEMS
ROOM 206
SESSION CHAIRS: Wen Li (Michigan State University)
Pit Pillatsch (University of California, Berkeley)

14:00
SPHERICAL MAGNETIC ENERGY HARVESTER WITH THREE ORTHOGONAL COILS
Josef Joos, Oliver Paul
Albert-Ludwigs-Universität Freiburg, Germany

14:15
LOW POWER ADAPTIVE POWER MANAGEMENT WITH ENERGY AWARE INTERFACE FOR WIRELESS SENSOR NODES POWERED USING PIEZOELECTRIC ENERGY HARVESTING
Zheng Jun Chew, Meiling Zhu
University of Exeter, United Kingdom

14:30
A PIEZOELECTRIC MICRO-ENERGY HARVESTER FOR NANOSENSORS
Yi Li, Zeynep Celik-Butler, Donald Butler
University of Texas at Arlington, USA

14:45
ELECTRET STABILITY RELATED TO THE CRYSTALLINITY IN POLYPROPYLENE
Anders Thyssen, Kristoffer Almdal, Erik Vilain Thomsen
Technical University of Denmark, Denmark

15:00
PLUG-THROUGH ENERGY MONITOR FOR PLUG LOAD ELECTRICAL DEVICES
Michael Lorek, Fabien Chraim, Kristofer Pister
University of California, Berkeley, USA

14:00 - 15:30
C4L-F: DEVICES/SYSTEMS II
ROOM 207
SESSION CHAIRS: Donald Malocha (University of Central Florida)

14:00
MINIATURIZED TWO STAGE AEROSOL IMPACTOR WITH CHIP-SCALE STAGES FOR AIRBORNE PARTICULATE SIZE SEPARATION
Maribel Maldonado-Garcia[2], Varun Kumar[2], Siavash Pourkamali[2], J.C. Wilson[1]
[1]University of Denver, USA; [2]University of Texas at Dallas, USA

14:15
COMPARISON OF TWO TYPES OF TACTILE SENSING LAYER IN TOUCH SCREEN PANEL FOR FORCE SENSITIVE DETECTION
Yeon Hwa Kwak[1], Wonhyo Kim[1], Sungkyu Seo[2], Kunnyun Kim[1]
[1]Korea Electronics Technology Institute, Korea; [2]Korea University, Korea

14:30
FULLY BIODEGRADABLE PRESSURE SENSOR, VISCOELASTIC BEHAVIOR OF PGS DIELECTRIC ELASTOMER UPON DEGRADATION
Clementine Marie Boutry, Amanda Nguyen, Qudus Omotayo Lawal, Alex Chortos, Zhenan Bao
Stanford University, USA

14:45
LATEST RESULTS ON THE HV-CMOS PIXEL SENSOR IN THE AMS H18 PROCESS
Simon Feigl
Istituto Nazionale di Fisica Nucleare, Switzerland

15:00
A MOTION-TOLERANT HEART RATE DETECTION METHOD USING BIO-IMPEDANCE AND MUSIC ALGORITHM
Jonghwa Lee, Seonghwan Cho
Korea Advanced Institute of Science and Technology, Korea

15:15
DEVELOPMENT OF A THREE-DIMENSIONAL INTEGRATED IMAGE SENSOR WITH PIXEL-PARALLEL SIGNAL PROCESSING ARCHITECTURE
Kei Hagiwara[1], Masahide Goto[1], Yuki Honda[1], Masakazu Nanba[1], Hiroshi Ohtake[1], Yoshinori Iguchi[1], Takuya Saraya[2], Masaharu Kobayashi[2], Hiroshi Toshiyoshi[2], Eiji Higurashi[2], Toshiro Hiramoto[2]
[1]Japanese Broadcasting Corporation, Japan; [2]University of Tokyo, Japan

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14:00 - 15:30
INDUSTRY TRACK II
ROOM 208

14:00
SENSORS ACTIVITIES AT MEMS INDUSTRY GROUP (MIG) & IEEE 2700 (SENSOR PERFORMANCE)
Michael Gaitan (MIG/NIST, USA)

14:30
SMART SENSOR AND NETWORK INTERFACES TO IOT IN SUPPORT OF BIG DATA
John L. Schmalzel (Rowan University, USA)

15:00
STANDARDS: IEEE P2413 – ARCHITECTURAL FRAMEWORK FOR INTERNET OF THINGS
Sri Chandrasekaran (IEEE-SA, India)

15:30 - 16:00
WEDNESDAY AFTERNOON BREAK
2F LOBBY

16:00 - 17:15
C5L-A: BIOLOGICAL & CHEMICAL SENSORS
ROOM 201
SESSION CHAIRS: Siyang Zheng (Penn State University)
Koichi Awazu (AIST)

16:00
TERAHERTZ GAS-SENSORS: GAS-PHASE SPECTROSCOPY AND MULTIVARIATE ANALYSIS FOR MEDICAL AND SECURITY APPLICATIONS
Philipp Neumaier[1], Klaus Schmalz[2], Johannes Borngräber[2], Dietmar Kissinger[2], Heinz-Wilhelm Hübers[1]
[1]German Aerospace Center, Germany; [2]Leibniz-Institut für innovative Mikroelektronik, Germany

16:15
A TWO-CHANNEL BACTERIA-BASED BIOSENSOR FOR WATER QUALITY MONITORING
Weiyang Yang, Xuejian Wei, Seokheun Choi
Binghamton University, State University of New York, USA

16:30
A NOVEL OLFACTORY NEURAL NETWORK FOR CLASSIFICATION OF CHINESE LIQUORS USING ELECTRONIC NOSE
Yaqi Jing, Qinghao Meng, Peifeng Qi, Ming Zeng
Tianjin University, China

16:45
PORTABLE ACTIVE SENSORS FOR HUMAN SWEAT RATE MONITORING
Jai Kyoung Sim, Young-Ho Cho
Korea Advanced Institute of Science and Technology, Korea

17:00
TDLAS USING FPGA-BASED LOCK-IN DETECTION FOR MULTI-CHANNEL CHEMICAL SPECIES TOMOGRAPHY
Andrea Chighine[{1}], Stylianos-Alexios Tsekenis[{1}], Edward Fisher[{1}], Nick Polydorides[{1}], David Wilson[{2}], Michael Lengden[{2}], Walter Johnstone[{2}], Hugh McCann[{1}]
[{1}]University of Edinburgh, United Kingdom; [{2}]University of Strathclyde, United Kingdom

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16:00 - 17:30
C5L-B: PHYSICAL SENSORS II
ROOM 202
SESSION CHAIRS: Andrei Shkel (University of California, Irvine)
Sinead O'Keeffe (University of Limerick)

16:00
AN RF/MICROWAVE MICROFLUIDIC SENSOR FOR MINIATURIZED DIELECTRIC SPECTROSCOPY BASED ON SENSOR TRANSMISSION CHARACTERISTICS
Michael Suster, Debnath Maji, Nicholas Vitale, Umut Gurkan, Pedram Mohseni
Case Western Reserve University, USA

16:15

PERFORMANCE OF THE ENGINEERING MODEL OF THE CSES HIGH PRECISION MAGNETOMETER

Bingjun Cheng[2], Bin Zhou[2], Werner Magnes[3], Roland Lammegger[1], Andreas Pollinger[3], Michaela Ellmeier[1], Christian Hagen[3], Irmgard Jernej[3]

[1]Graz University of Technology, Austria; [2]National Space Science Center, Chinese Academy of Sciences, China; [3]Space Research Institute, Austrian Academy of Sciences, Austria

16:30

A MACHINE LEARNING APPROACH TO FIND ASSOCIATION BETWEEN IMAGING FEATURES AND XRF SIGNATURES OF ROCKS IN UNDERGROUND MINES

Ashfaqur Rahman, Md Sumon Shahriar, Greg Timms, Craig Lindley, Andrew Boo Davie, David Biggins, Andrew Hellicar, Charlotte Sennersten, Greg Smith, Mac Coombe

Commonwealth Scientific and Industrial Research Organisation, Australia

16:45

A NOVEL CAPACITIVE MICROMACHINED TRANSDUCER FOR MICRO-PRESSURE MEASUREMENT

Zhikang Li[2], Libo Zhao[2], Yingjie Hu[2], Sina Akhbari[1], Zhuangde Jiang[2], Liwei Lin[1]

[1]University of California, Berkeley , USA; [2]Xi'an Jiaotong University, China

17:00

A SURFACE ACOUSTIC WAVE SENSOR TERMINAL BASED ON ONE-PORT RESONATOR FOR CONTACT STRESS MEASUREMENT IN SLITS

Haining Li[2], Jiexiong Ding[2], Zhipeng Zhou[2], Guangmin Liu[1]

[1]China Academy of Engineering Physics, China; [2]University of Electronic Science and Technology of China, China

17:15

ESTIMATING PARTICULATE MATTER USING COTS CAMERAS

Hsin-Hung Hsieh, Hu-Cheng Lee, Wen-Liang Hwang, Ling-Jyh Chen

Academia Sinica, Taiwan

16:00 - 17:30
C5L-D: HUMAN ACTIVITY MONITORING
ROOM 204
SESSION CHAIRS: Darrin Young (University of Utah)
Anna Mignani (Institute of Applied Physics, IFAC)

16:00
FINGER MOTION DETECTION GLOVE TOWARD HUMAN-MACHINE INTERFACE
Ji-Hoon Suh, Morteza Amjadi, Inkyu Park, Hyung-Joun Yoo
Korea Advanced Institute of Science and Technology, Korea

16:15
REAL-TIME RECONSTRUCTION OF FOOTPRINT POSITIONS USING AN "INTELLIGENT CARPET" IMAGING SENSOR
Jose Antonio Cantoral-Ceballos, Paul Wright, John Vaughan, Patricia J. Scully, Krikor B. Ozanyan
University of Manchester, United Kingdom

16:30
VISION-BASED INTERFACE FOR PEOPLE WITH SERIOUS SPINAL CORD INJURY
Chao Zhang, Takakazu Ishimatsu, Naoya Shiraishi, Jiangli Yu, Lawn Murray
Nagasaki University, Japan

16:45
SMART OPTRODE FOR NEURAL STIMULATION AND SENSING
Fahimeh Dehkhoda[{2}], Ahmed Soltan[{2}], Reza Ramezani[{2}], Hubin Zhao[{2}], Yan Liu[{1}], Tim Constandinou[{1}], Patrick Degenaar[{2}]
[{1}]Imperial College London, United Kingdom; [{2}]Newcastle University, United Kingdom

17:00
MEMRISTOR-BASED PIXEL FOR EVENT-DETECTION VISION SENSOR
Olufemi Olumodeji[{1}], Alessandro Bramanti[{2}], Massimo Gottardi[{1}]
[{1}]Fondazione Bruno Kessler, Italy; [{2}]ST Microelectronics, Italy

17:15
THREE SOURCES, THREE RECEIVERS, SIX DEGREES OF FREEDOM: AN ULTRASONIC SENSOR FOR POSE ESTIMATION & MOTION CAPTURE
Dennis Laurijssen, Steven Truijen, Wim Saeys, Jan Steckel
Universiteit Antwerpen, Belgium

16:00 - 17:00
C5L-F: SENSOR PACKAGING
ROOM 207
SESSION CHAIRS: Zhihong Li (Peking University)
Takahito Ono (Tohoku University)

16:00
WAFER-LEVEL FABRICATION OF STRAIN GAUGES ON PDMS MEMBRANES FOR LOW-PRESSURE SENSING
William Fausto Quirós-Solano, Gregory Pandraud, Pasqualina M. Sarro
Technische Universiteit Delft, Netherlands

16:15
ENCROACHMENT AND LINE OF SIGHT BLOCKING IN MICRO-CAVITY SEALING
Niladri Banerjee, Aishwaryadev Banerjee, Shashank Pandey, Bishnu Gogoi, Carlos H. Mastrangelo
University of Utah, USA

16:30
MODULATE THE CHAMBER PRESSURE OF THE HERMETIC SEALED MEMS DEVICE BY VARYING THE CAVITY DEPTH OF CAP SI
Shyh-Wei Cheng[{1}], Jui-Chun Weng[{2}], His-Cheng Hsu[{2}], Yi-Chiang Sun[{1}], Yang-Che Chen[{2}], Weileun Fang[{1}]
[{1}]National Tsing Hua University, Taiwan; [{2}]Taiwan Semiconductor Manufacturing Company, Limited, Taiwan

16:45
A NOVEL OPTICAL SELF-ALIGNMENT TECHNOLOGY FOR REALIZATION OF COMPACT OPTICAL MULTI-GAS SENSOR SYSTEM
Yoshiya Yamamoto[{1}], Ryosuke Shinozaki[{1}], Ippei Asahi[{2}], Hideki Ninomiya[{2}], Fusao Shimokawa[{1}], Hidekuni Takao[{1}]
[{1}]Kagawa University, Japan; [{2}]Shikoku Research Institute, Japan

16:00 - 17:30
STANDARDS PANEL
ROOM 208

Moderator: Gerry Hayes (Wireless Center of NC, USA)
Jim Philipp (Murata, USA)
Mike Gaitan (NIST/MIG, USA)
Younghyun Kim (Samsung, Korea)

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