Program

International Symposium on Olfaction and Electronic Nose (ISOEN)

ISOEN 2011

May 2-5, 2011

Rockefeller University
1230 York Avenue, New York, NY 10065

Chair

Perena Gouma
SUNY at Stony Brook, USA
Engineering Conferences International (ECI) is a not-for-profit global engineering conferences program, originally established in 1962, that provides opportunities for the exploration of problems and issues of concern to engineers and scientists from many disciplines.

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Jan Mitrovics, JML Innovation, Germany
Takamichi Nakamoto, Tokyo Tech, Japan
Maria Luz Rodriguez-Mendez, University of Valladolid, Spain
Susan Rose-Pehrsson, Naval Research Laboratory, USA
Joseph Stetter, KWJ Engineering Inc., USA
Monday, May 2, 2011

17:30 – 19:30 Check-in & Welcome Reception (Rockefeller University – Weiss Café-East Room)

Notes

• Conference locations will be as follows:
  o **Tuesday, May 3**
    ▪ Sessions Caspary Auditorium
    ▪ Lunch/Poster Session Abby Lounge and Dinning Room
  o **Wednesday, May 4**
    ▪ Concurrent Sessions Weiss Research Building
      • Session A Room 301
      • Session B Room 305
      • Session C Room 302
    ▪ Conference Banquet and Awards
      Dinner Cruise on the Spirit of New York
      Participants must arrange their own transportation to the banquet – The address is 61 Chelsea Pier and West Side Highway.
      (arrive at 61 Chelsea Pier at 18:30 for boarding, departing promptly at 19:00)
  o **Thursday, May 5**
    ▪ Sessions Caspary Auditorium
    ▪ Lunch/Poster Session Abby Lounge and Dinning Room

• Audiotaping, videotaping and photography of presentations are prohibited.

• Speakers – Please leave at least 3-5 minutes for questions and discussion.

• Please do not smoke at any conference functions.

• Turn your cellular telephones to vibrate or off during technical sessions.

• Be sure to make any corrections to your name/contact information on the Master Participant List or confirm (with your initials) that the listing is correct. A corrected copy will be sent to all participants after the conference.
Tuesday, May 3, 2011 (all sessions to be held at Caspary Auditorium)

Breakfast on your own

08:30 – 16:00   Conference Check-in / ECI conference information desk open

09:00 – 09:15   Welcome Introductions
Professor Perena Gouma, Conference Chair
Professor Julian Gardner, President of ISOCS

09:15 – 10:15   **Session 1: Keynote Lecture**

09:15 – 09:25   Introduction by Alan Gelperin

09:25 – 10:15   **Sensors and sensation: The molecular neurobiology of smell**
Dr. Leslie B. Vosshall
Robin Chemers Neustein Professor, Rockefeller University, USA

10:15 – 10:30   Coffee break

10:30 – 12:45   **Session 2: Focused Session - Optical nose**
Session Chair: Troy Nagle

10:30 – 11:00   Plenary Talk – A colorimetric sensor array for determination and identification of toxic industrial chemicals
Kenneth Suslick
University of Illinois at Urbana-Champaign, USA

11:00 – 11:30   Invited Talk - Optical detection for chemical sensing on ubiquitous devices
Daniel Filippini
Linköping University, Sweden

11:30 – 12:00   Invited Talk - Colors and odors: Porphyrinoids based artificial olfaction systems
Roberto Paolesse
University of Rome, Italy

12:00 – 12:30   Invited Talk - Gold nanoparticles: Effective receptors for ‘chemical nose’ sensing of proteins, bacteria, and mammalian cells
Vincent Rotello
University of Massachusetts Amherst, USA

12:30 – 14:00   **Lunch and Poster Session I**
Tuesday, May 3, 2011 (continued)

14:00 – 15:30  **Session 3: Focused Session - Live cell-based sensors**
Session Chair: Krishna Persaud

14:00 – 14:30  Plenary Talk - *Live cell-based sensor cells for nano-biomaterials evaluation*
Akiyoshi Taniguchi
Waseda University-NIMS, Japan

14:30 – 15:00  Invited Talk - *Cultured cell based biosensor for qualified analysis as HTA*
Tetsuya Haruyama
Kyushu Institute of Technology, Japan

15:00 – 15:30  Invited Talk - *Biological-switch-gate semiconductor-based biosensing technique for bio-functional analysis*
Toshiya Sakata
The University of Tokyo, Japan

15:30 – 15:45  Coffee break

15:45 – 16:45  **Session 4: Focused Session - Sensor data processing**
Session Chair: Santiago Marco

15:45 – 16:15  Plenary Talk - *Experiences in pattern recognition for machine olfaction*
Conrad Bessant
Cranfield University, United Kingdom

16:15 – 16:45  Invited Talk - *Advances in active and adaptive chemical sensing*
Ricardo Gutierrez-Osuna
Texas A&M University, USA

17:00 – 19:00  Dinner on your own and free evening

17:00 – 19:00  ISOCS general assembly meeting (Caspary Auditorium)

19:00 – 21:00  ISOCS executive committee dinner meeting (invitation only)
Wednesday, May 4, 2011 (Session A in room 301)

Breakfast on your own

08:30 – 16:00   ECI conference information desk open

SESSION A

08:15 – 10:30   Session 5: Electronic olfaction for breath analysis diagnostics
Session Chair: Steve Semancik

08:15 – 08:30   Identification of relevant olfactory receptors to be used as sensing elements of a bioelectronic odorant detection nanoplatform
Aurelie Dewaele
INRA, France

08:30 – 09:00   Invited Talk - A nanoscale artificial nose (NA-NOSE) for detecting volatile biomarkers of cancer
Hossam Haick
Technion, Israel

09:00 – 09:15   The role of spike temporal latencies in artificial olfaction
Eugenio Martinelli
University of Rome Tor Vergata, Italy

09:15 – 09:30   An electronic nose (cyranose-320) can distinguish between patients with obstructive sleep apnoea syndrome and healthy controls
Timm Greulich
University Hospital of Giessen and Marburg, Germany

09:30 – 09:45   Portable device for real-time breath acetone detection
Lisheng Wang
University of British Columbia, Canada

09:45 – 10:00   On line real-time odours dispersion modeling systems using electronic noses
Louis Vivola
ALPHA MOS, France

10:00 – 10:15   COPD identification by the analysis of breath with an electronic nose
Marco Santonico
University of Rome Tor Vergata, Italy

10:15 – 10:30   Semi-supervised learning techniques in artificial olfaction applications: a novel approach to drift counteraction
Saverio De Vito
ENEA, Italy

10:30 – 10:45   Coffee break

10:45 – 13:00   Session 6: Data processing on combined organoleptic system data
Session Chair: Ricardo Gutierrez-Osuna

10:45 – 11:00   Quantification of gas mixtures with active recursive estimation
Rakesh Gosangi
Texas A&M University, USA
Wednesday, May 4, 2011 (Session A in room 301) (continued)

11:00 – 11:15  Covariance matrix adaptation evolutionary strategy for drift correction of electronic nose data
Matteo Falasconi
CNR-IDASC & University of Brescia, Italy

11:15 – 11:45  Invited Talk - Joining e-nose and vision characterizations for the fine quantification of olive oil adulteration
Matteo Pardo
Institute of Applied Mathematics and Information Technology, CNR, Italy

11:45 – 12:00  Artificial odor map and discrimination of odorants using the odor separating system
Masahiro Imahashi
Kyushu University, Japan

12:00 – 12:15  Study of odor approximation by using mass spectrometer
Takamichi Nakamoto
Tokyo Institute of Technology, Japan

12:15 – 12:30  Active sensing with Fabry-Perot infrared interferometers
Jin Huang
Texas A&M University

12:30 – 12:45  Gas sensors array applied to the monitoring of biogas process
Gilles Adam
University of Liege, Belgium

12:45 – 13:00  Array of Love-wave sensors to detect CWA low-levels
Daniel Matatagui
CSIC, Spain

13:00 – 14:00  Boxed lunch

14:00 – 16:45  Session 7: Novel Sensor/E-nose Concepts
Session Chair: Baranidharan Raman

14:00 – 14:30  Invited Talk - Possibility of SPR application as an electronic nose
Ken Watanabe
NIMS, Japan

14:30 – 14:45  Biomimetic chemical sensors using nanoelectronic read out of olfactory Receptor Proteins
A.T. Charlie Johnson
University of Pennsylvania, USA

14:45 – 15:00  Selective vapor monitoring using individual multivariable RFID sensors
Cheryl Surman
GE-Global Research, USA

15:00 – 15:15  H+ activated polyaniline sensors
Aisha Haynes
US Army ARDEC, USA
15:15 – 15:30  Lignin-based nanocomposite polymeric materials for liquid sensing  
Alisa Rudnitskaya  
University of Aveiro, Portugal

15:30 – 15:45  Coffee break

15:45 – 16:00  DNA-decorated carbon nanotube-based FETs as ultrasensitive chemical sensors  
A.T. Charlie Johnson  
University of Pennsylvania, USA

16:00 – 16:30  Invited Talk – The photonic nose: smelling chemicals with structural color  
Leonardo Bonifacio  
Opalux, Inc, Canada

16:30 – 16:45  Solid-state nanostructured thin-film RuO2-based pH sensors: Influence of film thickness  
Serge Zhuiykov  
CSIRO, Australia

16:45 – 17:00  Improving MOS virtual multisensor systems by combining temperature cycled operation with impedance spectroscopy  
Andreas Schuetze  
Saarland University, Germany

17:00  Participants must arrange their own transportation to the banquet – The address is 61 Chelsea Pier and West Side Highway

18:30 – 22:00  Conference Banquet and Awards  
Dinner Cruise on the Hudson River  
(arrive at 61 Chelsea Pier at 18:30 for boarding, departing promptly at 19:00)
### SESSION B

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
<th>Institution/University</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:15 – 12:45</td>
<td><strong>Session 8: Novel materials for sensors and advanced sensing systems</strong></td>
<td>Session Chair: Tetsuya Haruyama</td>
<td></td>
</tr>
<tr>
<td>08:15 – 08:30</td>
<td>Kinetic and statistical analysis of the conductance transient to address the selectivity issue of the wet chemically synthesized tailored nano-structured ferrite gas sensors</td>
<td>Kalisadhan Mukherjee</td>
<td>Indian Institute of Technology, India</td>
</tr>
<tr>
<td>08:30 – 09:00</td>
<td>Invited Talk - <strong>Applications of metal oxides nanowires in safety and security</strong></td>
<td>Elisabetta Comini</td>
<td>University of Brescia, Italy</td>
</tr>
<tr>
<td>09:00 – 09:15</td>
<td>Hybrid polymer 1D nanostructure-based sensor arrays for detection of explosives</td>
<td>Christopher Field</td>
<td>U.S. Naval Research Laboratory, USA</td>
</tr>
<tr>
<td>09:15 – 09:45</td>
<td>Controlled synthesis of ZnO nanostructures for ppb-level VOC detection</td>
<td>Shaolin Zhang</td>
<td>Kyungpook National University, Korea</td>
</tr>
<tr>
<td>09:30 – 09:45</td>
<td>Preparation and sensor properties of conducting molecular sieve ceramics based on potassium and silver hollandite</td>
<td>Marco Mugnaini</td>
<td>Universita di Siena, Italy</td>
</tr>
<tr>
<td>09:45 – 10:00</td>
<td>An analog low-power frequency readout ASIC for a SAW array</td>
<td>Shih-Wen Chiu</td>
<td>National Tsing Hua University, Taiwan</td>
</tr>
<tr>
<td>10:00 – 10:15</td>
<td>Coffee break</td>
<td></td>
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<tr>
<td>10:15 – 10:30</td>
<td>Measurement of food texture by an acoustic vibration method</td>
<td>Naoki Sakurai</td>
<td>Hiroshima University, Japan</td>
</tr>
<tr>
<td>10:30 – 10:45</td>
<td>Evaluating zeolite-modified sensors: towards a faster set of chemical sensors</td>
<td>Alexander Vergara</td>
<td>University of California, San Diego, USA</td>
</tr>
<tr>
<td>10:45 – 11:00</td>
<td>A high temperature SOI CMOS NO₂ sensor</td>
<td>Julian Gardner</td>
<td>The University of Warwick, United Kingdom</td>
</tr>
<tr>
<td>11:00 – 11:15</td>
<td>Development and characterization of YCoO₃ based CO gas sensors</td>
<td>Marco Mugnaini</td>
<td>Universita di Siena, Italy</td>
</tr>
</tbody>
</table>
Wednesday, May 4, 2011 (Session B in room 305) (continued)

11:15 – 11:30  Phthalocyanines as sensitive coatings for QCM sensors-experimental results and computational approaches  
Dilek Erbahar  
TUBITAK Marmara Research Center, Turkey

11:30 – 12:00  Invited Talk - Voltammetric sensors and biosensors based on phthalocyanines for an electronic tongue  
Maria Luz Rodriguez-Mendez  
University of Valladolid, Spain

12:00 – 12:15  Classification and concentration estimation of explosive precursors using nanowires sensor array and decision tree learning  
Junghwan Cho  
University of Massachusetts Lowell, USA

12:15 – 12:30  Development of ultra-low power metal oxide sensors and arrays for embedded applications  
Brent Lutz  
Synkera Technologies Inc., USA

12:30 – 12:45  Electronic nose sensor array optimization using rough set theory  
Rajib Bandyopadhyay,  
Jadavpur University, India

12:45 – 14:00  Boxed Lunch

14:00 – 16:45  Session 9: Artificial olfaction in quality control  
Session Chair: Sandrine Isz

14:00 – 14:30  Invited Talk - Odor recognition vs. classification in artificial olfaction  
Barani Raman  
Washington University, USA

14:30 – 14:45  Sensing basic tastes by electronic tongue sensors  
Zoltan Kovacs  
Corvinus University of Budapest, Hungary

14:45 – 15:00  Application of combined electronic nose and tongue technology in petfood flavor development and quality control  
Omobola Oladipupo  
AFB International, USA

15:00 – 15:15  Detection of hexanal in rotten milk using a cell-derived olfactory nanovesicle-based bioelectronic nose  
Jong Hyun Lim  
Seoul National University, Korea

15:15 – 15:30  Coffee break

15:30 – 15:45  Ratiometric chemical blend processing with a neuromorphic model of the insect macrogglomerular complex  
Tim Pearce  
University of Leicester
Wednesday, May 4, 2011 (Session B in room 305) (continued)

15:45 – 16:00  Humidity compensation of bad-smell sensing system using a detector tube and a built-in camera
               Takamichi Nakamoto
               Tokyo Institute of Technology, Japan

16:00 – 16:15  Quality control of spices by multigas sensors
               Thomas Huebert
               BAM Federal Institute for Materials Research & Testing, Germany

16:15 – 16:30  Kinetics of dry roasting as related to peanut quality
               Jack Davis
               USDA ARS Market Quality, USA

16:30 – 16:45  An application of specific sensors for the monitoring of NaCl in soft cheeses
               Patrick Mielle
               INRA, UMR CSGA, France

16:45 – 17:00  Identification of geographical origin of coffee before and after roasting by electronic nose
               Veronica Sberveglieri paper 128
               University of Modena e Reggio Emilia, Italy

17:00  Personal transit to banquet – location 61 Chelsea Pier and West Side Highway

18:30 – 22:00  Conference Banquet and Awards
               Dinner Cruise on the Hudson River.
               (arrive at 61 Chelsea Pier at 18:30 for boarding, departing promptly at 19:00)
Session 10: E-tongues
Session Chair: Milutin Stanacevic

08:15 – 08:30
Temperature cycled operation of SiC field effect gas sensors: Increasing the selectivity for improved sensor systems
Andreas Schutze
Saarland University, Germany

08:30 – 09:00
Invited Talk - Electronic Tongue on a way towards the universal bitterness scale
Andrey Legin
St. Petersburg University, Russia

09:00 – 09:15
Bioelectronic tongue employing enzyme-modified sensors for the resolution of phenolic antioxidant mixtures
Xavier Ceto
Universitat Autonoma de Barcelona, Spain

09:15 – 09:30
Electronic tongue-FIA system for the monitoring of heavy metals biosorption processes
Manel del Valle
Universitat Autonoma de Barcelona, Spain

09:30 – 09:45
A PKD channel-based biosensor for taste transduction
Ping Wang
Zhejiang University, China

09:45 – 10:00
Food saltiness optimization using in-mouth sensors
Patrick Mielle
INRA, UMR CSGA, France

10:00 – 10:15
Development of electronic tongue system for quantification of rare earth metals in spent nuclear fuel reprocessing
Dmitry Kirsanov
St. Petersburg State University, Russia

10:15 – 10:30
Coffee break

Session 11: Applications of sensor arrays in safety and defense
Session Chair: Corrado Di Natale

10:30 – 10:45
Electronic noses as flexible tools for evaluating food quality and safety: can we trust them?
Isabella Concina
CNR-IDASC & Brescia University, Italy

10:45 – 11:00
Sensing materials with a concurrent sensitivity: design, synthesis and application in multisensory systems
Larisa Lvova
University of Rome Tor Vergata, Italy
Wednesday, May 4, 2011 (Session C in room 302) (continued)

11:00 – 11:15
Portable electronic nose system for identification of synthesized gasoline using single metal oxide gas sensor and pattern recognition
Young Wung Kim
Kyungpook National University, Korea

11:15-11:30
TD kernel DM+V: Time-dependent statistical gas distribution modelling on simulated measurements
Achim Lilienthal
Orebro University, Sweden

11:30 – 12:00
Invited Talk - Advances toward practical detection of trace chemical hazards with solid state microarray devices
Steve Semancik
NIST, USA

12:00 – 12:15
Early detection of fungal contamination on green coffee by a MOX sensors based electronic nose
Veronica Sberveglieri paper 95
CNR-IDASC & Brescia University, Italy

12:15 – 12:30
An analog multilayer perceptron neural network with on-chip learning for a portable electronic nose
Chih-Heng Pan
National Tsing Hua University, Taiwan

12:30 – 12:45
Electronic nose characterization of the quality parameters of freeze-dried bacteria
Eugenio Martinelli
University of Rome Tor Vergata, Italy

12:45 – 14:00
Boxed Lunch

14:00 – 16:45
Session 12: Medical applications of sensors and sensor systems
Session Chair: Jan Mitrovits

14:00 – 14:30
Invited Talk - A review of rhinological applications of electronic nose technology
Erica Thaler
University of Pennsylvania, USA

14:30 – 14:45
Detection and identification of inflammatory bowel disease by electronic nose
Nathalie Ouaret, University of Warwick, United Kingdom

14:45 – 15:00
Mammalian odor information recognition by implanted microsensor array in vivo
Jun Zhou
Zhejiang University, China

15:00 – 15:15
Towards a multi-centre approach for breath metabolomics; viability of discriminative potential after adsorption, storage and desorption of exhaled air samples
Lieuwe Bos
Amsterdam Academic Medical Center, The Netherlands
<table>
<thead>
<tr>
<th>Time</th>
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</table>
| 15:15 – 15:30 | Effects of self-generated heat on gas sensing in mobile robots and olfactory sensing in humans  
Hiroshi Ishida  
Tokyo University of Agriculture and Technology, Japan |
| 15:30 – 15:45 | Coffee break                                                           |
| 16:00 – 16:15 | Chemical sensitivity of porphyrinoid-functionalized cotton yarns      
Corrado Di Natale  
University of Rome Tor Vergata, Italy |
| 16:15 – 16:30 | Identification of the different sources responsible for the olfactory annoyance, using an e-nose  
Kevin Clarke  
Universite de Liege, Belgium |
| 16:30 – 16:45 | Data-driven modeling of metal-oxide sensors with dynamic bayesian networks  
Rakesh Gosangi  
Texas A&M University, USA |
| 16:45 – 17:00 | Concluding Remarks  
by session chairs |
| 17:00      | Personal transit to banquet – location 61 Chelsea Pier and West Side Highway |
| 18:30 – 22:00 | Conference Banquet and Awards  
Dinner Cruise on the Hudson River.  
(arrive at 61 Chelsea Pier at 18:30 for boarding, departing promptly at 19:00) |
Thursday, May 5, 2011 (Caspary Auditorium)

Breakfast on your own

08:30 – 12:00  ECI conference information desk open

08:30 – 11:30  Session 13: Novel sensor materials and device platforms for artificial noses
               Session Chair: Giorgio Sberveglieri

08:30 – 09:00  Plenary Talk - Nano-structured oxides by surface modification: platforms for chemical sensing and beyond
               Sheikh A. Akbar
               The Ohio State University, USA

09:00 – 09:30  Invited Talk - Research into use of non woven fibers as food biosensor platforms
               Kris Senecal
               US Army RDECOM, NSRDEC, USA

09:30 – 10:00  Invited Talk - A 166-dB dynamic range and low power interface circuit for gas-sensing System
               Milutin Stanacevic
               SUNY Stony Brook, USA

10:00 – 10:15  Coffee break

10:15 – 15:00  Session 14: Biologically inspired computation for chemical sensing
               Session Chair: Julian Gardner

10:15 – 10:45  Invited Talk - Signal processing for chemical sensing: statistics or biological inspiration
               Santiago Marco
               University of Barcelona, Spain

10:45 – 11:00  Study of sensory diversity and redundancy to encode for chemical mixtures
               Agustin Gutierrez-Galvez
               IBEC, Spain

11:00– 11:30  Chemical plume source localization with multiple mobile sensors using bayesian inference under background signals
               Santiago Marco
               University of Barcelona, Spain

11:30 – 11:45  A large scale chemical sensor array testing biological olfaction concepts
               Krishna Persaud
               CNR-IMM, Italy

11:45 – 12:00  A large scale virtual gas sensor array
               Alexandre Perera Lluna
               Universitat Politècnica de Catalunya, Spain

12:00 – 14:00  Lunch and poster session II

14:00 – 15:00  Closing session, ISOCS new president announcement, next ISOCS meeting location announcement, poster awards
A. **Breath Analysis**

1. **Exhaled breath analysis for the monitoring of elderly COPD patients health-state**  
   Giorgio Pennazza  
   University of Rome, Italy

2. **Monitoring the halitosis with an electronic nose**  
   Giorgio Pennazza  
   University of Rome, Italy

3. **Hand held numeric prototype for breath analyzing**  
   Aditya Shyam Ambre  
   State University of New York at Stony Brook, USA

4. **An electronic nose distinguishes the exhaled breath condensates obtained by two different devices and two different breath patterns**  
   Andreas Rembert Koczulla  
   Philipps-Universitat Marburg, Germany

5. **An electronic nose based on hybrid MOS-SAW sensors for detection of different biomarkers of lung cancer**  
   Ping Wang  
   Zhejiang University, China

6. **Multi-model diagnosis method for lung cancer based on MOS-SAW breath detecting e-nose**  
   Ping Wang  
   Zhejiang University, China

7. **Portable gas sensor for breath analysis**  
   Marco Righettoni  
   ETH Zurich, Switzerland

8. **Continuous exhaled breath analysis on the ICU: Feasibility study**  
   Lieuwe DJ Bos  
   Academic Medical Center, The Netherlands

9. **Nanosensor array-based breath analyzer for disease diagnosis**  
   Perena Gouma  
   Stony Brook University, USA
B. Quality Control

10. **A supervised feature extraction method for GCMS data based on PLS: Application to the detection of adulterated olive oil**
   Eugenio Martinelli
   University of Rome, Italy

11. **Portable electronic nose to discriminate artificial aged wine from barrel-aged wine**
   Jose Pedro Santos
   CSIC, Spain

12. **Using a multi-way analysis for the application of an electronic noses in wine quality control**
    N. Prieto
    University of Valladolid, Spain

13. **Aroma analysis by GC/MS and electronic nose dedicated to negroamaro and primitivo typical apulian wines**
    Simonetta Capone
    IMM-CNR, Italy

14. **Olive oil headspace characterization by a gas sensor array**
    Corrado Di Natale
    University of Rome, Italy

15. **Detection of acetic acid in wine by means of an electronic nose**
    Jose Pedro Santos
    Universidad de Extremadura, Spain

16. **An 'olfactory fatigue' measurement method for chinese liquors classification with a metal oxide gas sensor array**
    Shunping Zhang
    Huazhong University of Science and Technology, China

17. **A combined gas and liquid chemical sensors array for fuel adulteration detection**
    Corrado Di Natale
    University of Rome Tor Vergata
C. **Electronic Tongue**

18. **Novel sensors for the artificial mouth**  
   Patrick Mielle  
   INRA, UMR CSGA, France

19. **Use of an electronic tongue to detect geosmin in distilled water**  
   Guilherme de Souza Braga  
   University of Sao Paulo, Brazil

20. **Assessment of volatile sulfur compounds production by select oral bacteria with cysteine and methione as substrates measured by OralChroma™**  
   Nathanael Salako  
   Kuwait University, Kuwait

21. **Fusion of potentiometric & voltammetric electronic tongue for classification of black tea taste based on theaflavins (TF) content**  
   Nabarun Bhattacharyya  
   CDAC, Kolkata, India

22. **Portable e-Tongue based on multi-channel LAPS array with PVC membrane for rapid environment detection**  
   Ping Wang  
   Zhejiang University, China

23. **Data fusion from voltammetric and potentiometric sensors to build a hybrid electronic tongue applied in classification of beers**  
   Manel del Valle  
   University of Barcelona, Spain

24. **Discrimination of soils and assessment of some soil fertility parameters using an electronic tongue**  
   Manel del Valle  
   University of Barcelona, Spain

25. **An impedancemetric electronic tongue for discrimination of adulteration process of ethanol fuel with water**  
   Thiago Paixao  
   University of Sao Paulo, Brazil

26. **Sensory evaluation and electronic tongue analysis for sweetener recognition in coke drinks**  
   Daniel Szollosi  
   Corvinus University of Budapest, Hungary
27. Development of taste sensing system using inorganic membrane
   Yohichiro Kojima
   Tomakomai National College of Technology, Japan

D. Sensor Nanomaterials

28. Sensing characteristic of polyaniline/TiO2 nanocomposites
   Jeung Soo Huh
   Kyungpook National University, Korea

   Jusand Lee
   SUNY at Stony Brook, USA

30. Tunneling through surface barrier and oxygen in-diffusion in nanostructured SnO2 gas sensors
   Cesare Malagu
   University of Ferrara, Italy

31. TiO2 nanostructures for gas sensing room temperature
   Daniel Rodriguez
   Commission Nacional de Energia Atomica

32. Headspace analysis of Philippine civet coffee beans using gas chromatography mass spectrometry and electronic nose
   Matteo Falasconi
   CNR-IDASC Sensor, Italy
E. Environmental Monitoring

33. A gas sensor array for environmental air monitoring: A study case of application of artificial neural networks
   Marco Alvisi
   ENEA, Italy

34. Development of an electronic nose for environmental monitoring: detection of specific environmentally important gases at their odor detection threshold concentration
   Licinia Dentoni
   Politecnico di Milano, Italy

35. Cumulative measurement principle for the detection of small amounts of gaseous species
   Andrea Geupel
   University of Bayreuth, Germany

36. Electronic nose system combined with membrane interface probe for detection of VOCs in water
   Junghwan Cho
   University of Massachusetts Lowell, USA

37. Electronic noses implementation on landfill site
   Genevieve Carayon
   ALPHA MOS, France

38. Hand-held device for monitoring dissolved organics in fresh and recycled water on ppb levels
   Serge Zhuiykov
   Commonwealth Scientific Industrial Research Org., Australia

39. Pursuing contamination detection on aircraft CFRP surfaces by artificial olfaction techniques
   Saverio De Vito
   ENEA UTTP/MDB, Italy

40. Tin oxide nanowire sensors and their potential for selective detection of the toxic gases SO2 and H2S
    Anton Koeck
    AIT, Austria

41. Microwave-hydrothermal synthesis and vibrational spectroscopy of nanostructured (Ni,Mn,Co)SB2O6 compounds for chemical sensing
    Anderson Dias
    Federal University of Ouro Preto, Brazil
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F. Sensing Complex Odors

42. Discrimination of body odor using odor sieving sensor system
   Tadashi Takamizawa
   U.S.E. Co., Ltd., Japan

43. Towards an analogue neuromorphic VLSI instrument for the sensing of complex odours
   Julian Gardner
   University of Warwick, United Kingdom

44. Optimizing the operating temperature for an array of MOX sensors on an open sampling system
   Marco Trincavelli
   Orebro University, Sweden

45. Portable e-Nnose and multivariate data analysis to identify different kinds of drugs
   Benachir Bouchikhi
   Moulay Ismail University, Morocco

46. Development of odor gas sensor using TiO\textsubscript{2} nanostructures
   Jeung Soo Huh
   Kyungpook National University, Korea

47. Odour profile of different varieties of extra-virgin olive oil during deep-frying using an electronic nose and SPME-GC-FID
   Valeria Messina
   CINSO, Argentina

48. Odour profile and colour characteristics of waxy brakedown paralysis process in garlic assessed by instrumental methods
   Valeria Messina
   CINSO, Argentina

49. Odors discrimination by olfactory epithelium biosensor
   Ping Wang
   Zhejiang University, China

50. Odour mapping under strong backgrounds with a metal oxide sensor array
   Andrey Ziyatdinov
   ESAII, Spain

51. A portable gas sensor system for environmental monitoring and malodours control: Data assessment of an experimental campaign
   Marco Alvisi
   ENEA, Italy
52. **Temperature centric evaluation of sensor transients**  
   Alexander Vergara  
   University of California, San Diego, USA

53. **Gas identification by dynamic measurements of SnO2 sensors**  
   Daniel Rodriguez  
   Commission Nacional de Energia Atomica, Argentina

54. **Ensemble classifier strategy based on transient feature fusion in electronic nose**  
   Mohammad Ali Bagheri  
   Tarbiat Modares University, Tehran

**G. Sensor Systems**

55. **A flexible gas sensor for the integration into smart textiles**  
   Thomas Kinkeldei  
   ETH Zurich, Switzerland

56. **An on-chip multi-class support vector machine applied to portable electronic nose data classification**  
   Yao-Sheng Liang  
   National Tsing Hua University, Taiwan

57. **Towards a low-power miniaturized micromechanical electronic nose**  
   Sywert H. Brongersma  
   Holst Centre / IMEC, Holland
H. Biosensors & Bio-inspired Systems

58. Biosensor based on olfactory receptors immobilization for the detection of odorant compounds
Marta Sanmarti
IBEC, Spain

59. Cystic fibrosis sweat patch
Gagan Jodhani
Stony Brook University, USA

60. Molecularly imprinted polymer based sensor for the detection of theophylline
Guilherme de Souza Braga
University of Sao Paulo, Brazil

61. Metal ion binding motifs in vertebrate olfactory receptors
Ken Suslick
University of Illinois at Urbana-Champaign, USA

62. VLSI implementation of a bio-inspired olfactory spiking neural network
Hung-Yi Hsieh
National Tsing Hua University, Taiwan

63. Estimation of theaflavins (TF) and thearubigins (TR) ratio in black tea liquor using electronic vision system
Abhra Pal
C-DAC (K), India

64. Classification of optical-sensor response cues with a bi-dimensional wavelet-transform approach
Jose Murguia
Bio Circuits Institute, USA

65. Biomimetic transducting support for enhanced explosive detection thresholds
Nelly Piazzon
ISL, France