

# *Digital Olfaction Society*

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2<sup>nd</sup> World Congress of

## *Digital Olfaction Society 2014*

December 8-9, 2014

**Tokyo Institute of Technology, Japan**

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*“...The DOS 2014 Challenge is to Record & Digitalize Odors...”*

**DOS Demonstrations 2014 Program**

**Scientific Program**

# Digital Olfaction Society 2014

December 8-9, 2014 – Tokyo Institute of Technology, Japan

*...The idea is to create devices which can capture odors,  
turn them into digital data so as to transmit them everywhere in the  
world ...*

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Dear Colleagues and Friends,

Nowadays, visual and auditory information can be digitally captured, stored and reproduced. We are in touch with that information every day. If another important sense such as olfaction is digitally available, our lifestyle might be changed. Digital Olfaction Society held the first congress on digital olfaction in 2013 in Berlin, Germany. We had demonstrations of olfactory displays in addition to oral presentations. People were excited about those demos since they enjoyed mysterious experience in Berlin. We should continue our effort to have digital olfaction in our daily life. Thus, 2nd Digital Olfaction Society World Congress will be held in Tokyo in December 8-9, 2014.

The aim of the Second Digital Olfaction Society World Congress 2014 is to discuss:

- The advances of digital olfaction Research & Development
- The practical applications of digital olfaction
- The impact of these applications on our life and lifestyle

Digital Olfaction Society World Congress 2014 will highlight:

- The interdisciplinary sciences related to Olfaction and Digital olfaction.
- The way in which we can transfer the concrete breakthroughs of Research & Development towards
- industrial applications concerned by digital olfaction.
- How to design and extend the applications of digital smell technologies to everyday life.

## Why attend DOS World Congress 2014?

People who are interested in digital olfaction are invited to join this congress to gather the information of recent progress, share it with others and spread the information all over the world. Moreover, participants are encouraged to show demonstrations as well as presentations since we can share the experience of digital olfaction together. The goal of this congress is to establish the international link related to digital olfaction among a variety of fields such as biology, medicine, computer science, electronics, chemistry, mechanical engineering, psychology, art etc.

## Who will attend DOS World Congress 2014?

People from industries as well as academics are welcome.

The conference will gather international researchers and academics, R&D departments in link with all the field of digital olfaction, chemistry, mathematics, physics, biochemistry, electronics, engineering, computer science, food and cosmetic industries, olfactory intelligent systems companies, marketing

managers, investors and all other stakeholders in olfaction and digital olfaction industries in order to answer these questions.

### DOS 2014 Chairmen

**Marvin Edeas**, Chairman of Digital Olfaction Society, France

**Takamichi Nakamoto**, Tokyo Institute of Technology, Department of Physical Electronics, Japan

### DOS 2014 Scientific Committee

**Hossam Haick**, Technion, Israel Institute of Technology, Israel

**Yanxia Hou-Broutin**, CEA-Grenoble, France

**Baranidharan Raman**, Washington University in St-Louis, United States

**Kazunari Touhara**, University of Tokyo, Japan

**Noam Sobel**, Weizman Institute of Sciences, Israel

**Genki Yoshikawa**, National Institute for Material Sciences, Japan

### Local Organising Committee

**Hyung-Gi Byun**, Kangwon National University, Korea

**Weileun Fang**, National Tsing Hua University, Taiwan

**Hiroshi Ishida**, Tokyo University of Agriculture & Engineering, Japan

**Ryohei Kanzaki**, University of Tokyo, Japan

**Dongwook Kim**, Aromajoin, Japan

**Junichi Kita**, Shimadzu, Japan

**Tai Hyun Park**, Seoul National University, Korea

**Kiyoshi Toko**, Kyushu University, Japan

**Akira Tomono**, Tokai University, Japan

**Yasuyuki Yanagida**, Meijo University, Japan

### Among hot topics presented at the Digital Olfaction Society Congress 2014

- Devices to capture odors
- Odors turned into digital data
- Restitution of odors by the transmission of these data
- Artificial olfaction and biologically-inspired models
- New Generation of Sensors & E-nose
- High Smell Technologies as electronic noses, neural circuits in olfactory systems, artificial intelligence olfaction systems
- Biosensor systems, software program, chemical engineering, Telecommunication
- Environmental control
- Biomedical applications in olfactory treatments and diagnosis
- Translational Research in Digital Olfaction
- Cancer & Olfaction: from Dogs to Digital Olfaction
- Robotics & Digital Olfaction
- Olfactory Display & its Applications
- Odor Sensing
- The powerful of Olfactive Markers

### Call for Innovations and Demonstrations for Digital Olfaction Society World Congress 2014

The Scientific Committee will invite all industries to present their innovations and products in the digital olfaction world:

- Digital Scent Media: Scented SMS, e-mail, websites, USB flash driver, CD, DVD, scented-print
- Digital olfaction at the service of Human Health: Pattern mimicking the sniffing dogs, e-aromachology, nursing-homes, psychiatric hospitals, smell icons for blind people, olfactory diagnosis

- Formation and Olfactory Memory : Class-rooms, cooking shows
- Olfactory Marketing & Neuromarketing: Olfactive ads, olfactory packaging, interactive website, QR olfacodes, scented-menu....
- Food Industry : Quality & safety control of food products
- Digital Cosmetology : Own fragrance creation on line, smell-E-market
- Olfaction and Jewelery : Revolutionary watches, alarm-radio, scented brooch
- Olfactory Entertainment : Olfactory 3D movie-theaters, home's gadgets, guided-tour in biology & perfumery museums
- Digital scents at the service of Army: Simulating training systems, detection of danger, perfumes of military attack, explosive detection devices
- Interactive scented games : Odorant teddy, video games
- Housekeeping, Coziness & Safety at home
- Olfaction & Auto industry : Olfactive attention assistance for tired driver
- And many others...

### Digital Olfaction Society - Network Session

The Network Session is organized during DOS demonstrations session.

The objective of the Network Session is to provide a platform which brings together stakeholders involved in olfaction and digital olfaction, and especially in the field the valorization of digital olfaction applications and products:

- Food industries
- Cosmetics
- Phone companies
- Car Industries
- Others

We look forward to welcoming you in Tokyo for this particular event.

#### **Pr Marvin Edeas**

Chairman of the Digital Olfaction Society Committee & Co-Chairman of Scientific Committee

#### **Pr Takamichi Nakamoto**

Co-Chairman of Scientific Committee



# DOS 2014 Scientific & Demonstrations Program

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## DOS 2014 Demonstrations

The Scientific Committee invites all Academic & Industrial Teams to Present the Most Innovative Appliances, Devices, Methods, Ideas ... in the Digital Olfaction Field

## DOS 2014 Innovation Award

The DOS World Congress will present the most innovative appliances, devices, methods, ideas... that will be judged by a panel of industrial, engineers and members of the press, who delivered the Innovation Award after having had the opportunity to meet and interact with the new equipment.

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## Program of DOS 2014 Demonstrations

The demonstrations sessions will be divided in two parts:

- Before the practical demonstration, we invite each team to present orally their technology and the process of demonstration (5-10 minutes by team).
- During Demonstrations Session, each team will have a dedicated space to show, demonstrate, explain and discuss about his project.

Among Demonstrations selected by the scientific committee:



### **Smelling Screen: Generating Spatial Odor Distribution as if an Odor Source Had Been Placed onto an LCD Monitor Screen**

Haruka Matsukura , Hiroshi Ishida & Genta Urasaki  
*Tokyo University of Agriculture and Technology, Japan*



### **Cross-modal effect on scent and music**

Masaaki Iseki & Takamichi Nakamoto  
*Precision and Intelligence Laboratory, Tokyo Institute of Technology, Japan*



### **Digital Olfaction with Computer Controlled Odor Blender**

Naohiko Maruyama, *ONO-DENKI CO.,LTD.*  
Yuji Nozaki, *Tokyo Institute of Technology, Japan*



### **Aroma Shooter - Instantaneous Scent-Switching Aroma Ejector**

Dong Wook Kim & Yasui Aiko  
*Aromajoin Corporation, Japan*

### **Quantitative measurement of detection threshold and discrimination threshold and furthermore the quantitative measurement of masking effect**

Junichi Kita & Ms Yoshimi Sunohara  
*Shimadzu corporation, Japan*

### **Scent Projector: a method of delivering scented air locally using vortex rings**

Daisuke Oishi, Tomoki Kamiya, Takuya Nakano & Yasuyuki Yanagida  
*Meijo University, Japan*

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*You would like to present your innovative devices during  
DOS Demonstrations 2014 ?*

We remind you that you can submit your project and abstract by the online form **until October 6.**

**To access to the Demonstrations of DOS 2013 World Congress, please visit**

**[www.olfaction-site.com](http://www.olfaction-site.com)**

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## Scientific & Demonstrations Program

*Day 1 - December 8, 2014*

Congress Chairmen: Pr Marvin Edeas & Pr Takamichi Nakamoto

08h00 Registration Opening

09h00 2nd DOS World Congress: Welcome Note by Chairmen

Pr Marvin Edeas & Pr Takamichi Nakamoto

### Olfaction & Predictive Medicine: Perspectives of Digital Olfaction

Chaired by Marvin Edeas & Takamichi Nakamoto

09h05 Olfaction, Obesity & Skin-Ageing: Strategies to modulate olfactory receptors  
Marvin Edeas, Founder & Chairman of the Digital Olfaction Society Committee, France

09h50 Digital Olfactory Nanoarrays for Disease Detection from Breath and Skin  
Hossam Haick, Technion, Israel Institute of Technology, Israel

*10h45 - Coffee Break & Posters Session*

### Recent Advances of Digital Olfaction Research & Development

Chaired by Yanxia Hou-Broutin & Genki Yoshikawa

11h15 A metric approach to olfactory perceptual space  
Noam Sobel, Weizman Institute of Sciences, Israel

11h45 Odor Processing in Biological and Artificial Olfactory Systems  
Baranidharan Raman, Washington University in St-Louis, United States

12h15 Nanomechanical gas sensor: Recent Advances & Perspectives  
Genki Yoshikawa, National Institute for Material Sciences, Japan

*12h45 - Lunch Break & Posters Session*

### Afternoon Sessions Chaired by Hossam Haick & Baranidharan Raman

14h00 Landscapes of Taste: Continuous evolution patterns for electronic-nose-based analysis  
Yanxia Hou-Broutin, CEA-Grenoble, France

## Translational Research in Digital Olfaction

### Part I - Odor sensing

**14h30 Short Oral Presentations upon Abstracts Submission (10 + 2 minutes)**

**Odor classification by using neural network**

**Sigeru Omatu**, Osaka Institute of Technology, Japan

**A low cost smart gas sensing system for handheld anti-drunk**

**Jia-Yin Jhang**, National Tsing Hua University, Republic of China

**Highly selective nanoporous sensor for human health care management**

**Seimei Shiratori**, Keio University, Japan

**Qcm sensors with lipopolymers and olfactory receptor-expressing cells for odor sensing in gas/vapor phase**

**Bartosz Pawel Wyszynski**, Tokyo Institute of Technology, Japan

**Olfactory dysfunction and its link with subjective visual vertical (SVV) perception in parkinson's disease**

**Ali Khattab**, Bournemouth University, United Kingdom

*15h30 - Coffee Break & Posters Session*

**Study of the transient response for the prediction of the steady-state for gas sensors based on quartz crystal microbalance**

**Severino Muñoz-Aguirre**, Benemérita Universidad Autónoma de Puebla, Mexico

**Development of a small, replaceable sensory chip based on the carbon black-polymer composite materials**

**Ting-I Chou**, National Tsing Hua University, Republic of China

**Active airflow generation to aid robotic gas source localization**

**Ayano Murai**, Tokyo University of Agriculture and Technology, Japan

**Simulation of sensor network for odor source localization using optimization approach**

**Yossiri Ariyakul**, King Mongkut's Institute of Technology, Thailand

**Development of an electronic nose system based on non-continuous surface acoustic wave sensor array**

**Cheng-Chun Wu**, National Tsing Hua University, Taiwan

**Development of novel cell-based odorant sensor elements based on insect odorant receptors**

**Hidefumi Mitsuno**, University of Tokyo, Japan

**Bioelectronic nose with human-like performance using human olfactory receptors and nanomaterials**

**Hwi Jin Ko**, Seoul National University, Korea, Republic of South Korea

**Hand-Held Electronic-Nose with on-line remote classification for digital olfaction**

**Jesús Lozano**, University of Extremadura, Spain

**Response prediction of an insect's olfactory receptor neuron by using structural parameters of odorant and self-organizing map**

**Yuki Harada**, Tokyo Institute of Technology, Japan

**17h45 End of First Day**

**18h30 Digital Olfaction Society Dinner**

*If you are interested to participate, please register online.*



## *Day 2 - December 9, 2014*

Chaired by Hiroshi Ishida & Yasuyuki Yanagida

08h55 Introduction of DOS Second Day

09h00 **Chemical sensing mechanisms for olfactory receptors**  
Kazushige Touhara, University of Tokyo, Japan

### *Part II - Odor Sensing and Odor Visualization*

09h30 **Short Oral Presentations upon Abstracts Submission** (10 + 2 minutes)

**Development of molecular recognition materials for bioinspired odor cluster sensing**  
Chuanjun Liu, Kyushu University, Japan

**Bio-sniffer (biochemical gas sensor) with fiber-optic fluorometry for odorless formaldehyde vapor in residential atmosphere**  
Po Jen Chien, Tokyo medical and dental university, Japan

**Odor visualization by multispectral fluorescence imaging and odor feature value analysis**  
Hirotaaka Yoshioka, Kyushu University, Japan

**“Scent camera” for real-time imaging of breath (body) ethanol after alcohol drinking**  
Takahiro Arakawa, Tokyo Medical and Dental University, Japan

*10h20 - Coffee Break & Posters Session*

### *Part III – Olfactory Display*

10h50 **Short Oral Presentations upon Abstracts Submission** (10 + 2 minutes)

**A novel powder based olfactory display**  
Chang Heng-Chung, Tokyo Institute of Technology, Japan

**A programmable, wearable, multi-fragrance olfactory display**  
Umberto Cugini, Politecnico di Milano, Italy

**Study of wearable olfactory display using surface acoustic wave device**  
Kazuki Hashimoto, Tokyo Institute of Technology, Japan

**Application of starbons on olfactory display**  
Keisuke Tomono, University of York, United Kingdom

**Reducing the trailing tail of vortex rings by partial scent filling to improve localization performance of scent delivery**  
Daisuke Oishi, Meijo University, Japan

### *Part IV – Olfactory Display & its Applications*

**Short Oral Presentations upon Abstracts Submission** (10 + 2 minutes)

**Relationship between scent effects and video content with emotional properties**  
Sang-Kyun Kim, Myongji University, Republic of South Korea

**A study on the influence of odors on the users' evaluation of industrial products in a VR multisensory environment**  
Monica Bordegoni, Politecnico di Milano, Italy

**Difference of olfactory detection threshold between measuring methods by olfactory display using pulse ejection**  
Shutaro Homma, Keio University, Japan

## Digital Olfaction Displaying & Demonstrations

14h00 – 17h30

### 14h00 Introduction of DOS Demonstrations 2014

Takamichi Nakamoto, Tokyo Institute of Technology, Japan

### 14h10 General Presentation of Each Demonstrations

*Before the practical demonstration, we invite each team to present orally their technology and the process of demonstration (5-10 minutes by team).*

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*Among Demonstrations presented:*

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Haruka Matsukura, Hiroshi Ishida & Genta Urasaki, Tokyo University of Agriculture and Technology, Japan

#### **Cross Modal effect on scent and music**

Masaaki Iseki & Takamichi Nakamoto, Precision and Intelligence Laboratory, Tokyo Institute of Technology, Japan

#### **Digital Olfaction with Computer Controlled Odor Blender**

Naohiko Maruyama, ONO-DENKI CO., LTD.

Yuji Nozaki, Tokyo Institute of Technology, Japan

#### **Aroma Shooter - Instantaneous Scent-Switching Aroma Ejector**

Dong Wook Kim & Yasui Aiko, Aromajoin Corporation, Japan

#### **Quantitative measurement of detection threshold and discrimination threshold and furthermore the quantitative measurement of masking effect**

Junichi Kita & Yoshimi Sunohara, Shimadzu Corporation, Japan

#### **Scent Projector: a method of delivering scented air locally using vortex rings**

Daisuke Oishi, Tomoki Kamiya, Takuya Nakano & Yasuyuki Yanagida, Meijo University, Japan

15h30 – Coffee Break & Posters Session

### 17h30 Discussion - Questions / Answers about Digital Olfaction

- *What is most crucial for progressing the field of digital olfaction forward and to keep it as innovative as possible: new advanced materials? New transducers? Algorithms? Product design? Applications?*
- *How lab results in digital olfaction could be translated to commercial production, while passing through all regulatory (tough) roles. An example could be given for the case of the use of digital olfaction as a diagnostic tool for diseases.*

#### **Final Discussion & Concluding Remarks**

- *Perspectives & Opportunities*
- *Next strategic step for Digital Olfaction Society*
- *Publication about DOS proceedings in scientific journal or DOS book*

### 18h30 End of DOS 2014

Program, Registration & Practical Information available on

[www.olfaction-site.com](http://www.olfaction-site.com)