

The background features a large, light blue silhouette of a hand with fingers spread, positioned in the lower half. The upper half is filled with abstract, glowing blue and white patterns that resemble liquid or energy waves, creating a sense of motion and technology.

# EuroHaptics 2012

12-15 June 2012  
Tampere, Finland



UNIVERSITY  
OF TAMPERE



TAMPERE UNIVERSITY OF TECHNOLOGY

**NOKIA**

# Welcome to Tampere!

On behalf of the City of Tampere, it is my great pleasure to welcome the participants of the EuroHaptics conference to our city. The themes of the conference, which relate to the development of touch pad interfaces and the use of touch sensing solutions in the IT sector, are indeed very topical, and they are connected to a great many areas of life from medicine and rehabilitation to applied arts and consumer electronics.

The City of Tampere has been one of the leading industrial cities in Finland and in the Nordic countries since the 19th century. Tampere was originally founded around the textile and metal industries, and has experienced many changes in industrial structure. These have required fundamental changes to the city's own structures as well.

In the 1990s, heavy industry moved away from the red-brick production facilities in the city centre. This was a major change that worked for our favour, as Nokia Oyj's success provided a basis for the establishment of a strong ICT cluster in Tampere.

The 21st century will pose new challenges. Mobile products and services, games, intelligent traffic, and intelligent machines are growing sectors that currently employ over 6000 people in Tampere. World-class research in various fields is done here, for example in signal processing and optoelectronics.

The City of Tampere has promoted the development of new innovations with comprehensive business development programmes, themes that in the 21st century include the information society, health technology, and creative fields. The most recent innovation programme is Open Tampere, which was launched earlier this year to promote operating models for the generation of open innovations across sector borders.

The city's strengths include the availability of experts in the ICT sector, partner network, top-level research, and research cooperation of companies and universities. In addition, Tampere has several times been chosen as Finland's most attractive city to live and study in. Tampere offers an excellent operating environment for researchers and companies as well.

I wish the participants of the EuroHaptics conference a rewarding and enjoyable stay in our summery city.

Timo P. Nieminen  
Mayor of Tampere

# Welcome to EuroHaptics 2012!

EuroHaptics is a major international conference and the primary European meeting for researchers in the field of human haptic sensing and touch enabled computer applications. This diverse field covers research in areas including, but not limited to, haptic perception, haptic hardware development, through to end applications and users, such as surgical simulation, rehabilitation robotics, and haptic feedback for design and applied arts applications.

EuroHaptics 2012 takes place in the city of Tampere on June 12-15, 2012. After the successful event in Amsterdam in 2010, the aims were set high. Weather permitting, the timing of the conference showcases the nature of Finland at its best. It is a great time to visit the northern end of Europe.

Some of the main facts on EuroHaptics 2012 are the following: 155 submissions, 34 of which were accepted as oral talks, 54 as posters, and 11 as demos. Typical to the nature of haptics, many of the oral and poster presentations also provided a demo. In total, there were more than 30 demos accepted for presentation in the demo area, adjacent to the exhibit with more than 10 industrial sponsors. The number of attendees in the conference is still growing when this conference program booklet was prepared, but already there is more than 200 attendees registered.

As usual, organizing an international conference is a major effort and involves an extensive amount of work to make it happen. We would like to acknowledge the work of the members of the organizing committee, program committee, student volunteers and local support staff. Without their efforts this conference would not have happened at all.

We welcome all the attendees who are making this international event a success!

Roope Raisamo  
University of Tampere  
General Chair

Kaisa Väänänen-Vainio-Mattila  
Tampere University of Technology  
General Co-Chair

Jyri Huopaniemi  
Nokia Research Center  
General Co-Chair

# Program

## TUESDAY 12.6: Workshops

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**Note!** All workshops are located at the University of Tampere, in the Pinni B building.

11:00-14:00 Registration at University of Tampere, Pinni B building

12:00-17:00 Pinni B3109  
TECHTILE toolkit: Haptic design environment for sharing haptic experience  
Masashi Nakatani, Yasuaki Kakehi, Kouta Minamizawa, Soichiro Mihara + YCAM InterLab

12:00-17:00 Pinni B3110  
Enhancing Traveler's Awareness in Smart Traffic  
Hannu Korhonen and Ahmed Farooq  
University of Tampere

14:00-17:00 Pinni B3111  
Multi-Finger Haptic Interaction  
Ignacio Galiana and Manuel Ferre  
Centre for Automation and Robotics UPM-CSIC

16:00-18:00 Registration at the main conference venue, Hotel Rosendahl

## WEDNESDAY 13.6.

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The venue for the main conference is Hotel Rosendahl.

08:00 Registration opens

09:00-09:15 Conference opening Plenary hall

09:15-09:45 Poster/demo teaser 1 Plenary hall

P001: Line length judgments are better when based on cutaneous rather than kinesthetic inputs, George Van Doorn, Barry Richardson, Mark Symmons & Jacqui Howell

D003: Design of Cylindrical Whole-hand Haptic Interface using

Electrocutaneous Display, Hiroyuki Kajimoto

P005: The precision of haptic rod length perception is reduced by vision, Nienke B. Debats, Idsart Kingma, Peter J. Beek & Jeroen B.J. Smeets

P009: Sensorimotor feedback for interactive realism: evaluation of a haptic driving paradigm for a forklift simulator, Pierre Martin, Nicolas Férey, Céline Clavel & Patrick Bourdot

P010: Masking Effects for Damping JND, Markus Rank, Thomas Schauß, Angelika Peer, Sandra Hirche & Roberta L. Klatzky

P011: Near-Threshold Just Noticeable Differences of Vibrotactile Forces at the Fingertip, Christian Hatzfeld & Roland Werthschützky

P012: Mechanical Impedance as Coupling Parameter of Force and Deflection Perception: Experimental Evaluation, Christian Hatzfeld & Roland Werthschützky

P021: The Misperception of Length in Vision, Haptics and Audition, Jacqui Howell, Mark Symmons & George Van Doorn

P023: Haptic Invitation of Textures: An Estimation of Human Touch Motions, Hikaru Nagano, Shogo Okamoto & Yoji Yamada

P027: Towards a standard on evaluation of tactile/haptic

interactions, Ian Sinclair, Jim Carter, Sebastian Kassner, Jan van Erp, Gerhard Weber, Linda Elliott & Ian Andrew

P029: Effect of Mechanical Ground on the Vibrotactile Perceived Intensity of a Handheld Object, Inwook Hwang & Seungmoon Choi

P032: Low-Cost 5-DOF Haptic Stylus Interaction using Two Phantom Omni Devices, Ben Horan, Mats Isaksson & Saied Nahavandi

P028: SHIFT: Interactive Smartphone Bumper Case, Jong-uk Lee, Jeong-Mook Lim, Heesook Shin & Ki-Uk Kyung

D080: Flexible Visio-Haptic Display, Ki-Uk Kyung, Jong-uk Lee, Suntak Park, Harsha Prahad & Philip Guggenberger

D119: Transparent Haptics, Youngsung Kim, Suntak Park & Ki-Uk Kyung

D107: Koo-boh: Variable Tangible Properties in a Handheld Haptic-Illusion Box, Johan Kildal

D115: Pseudo-haptic feedback on softness in the hand, Takashi Kimura & Takuya Nojima

09:45-11:00 Poster/demo session 1 & Coffee

Exhibit hall

[Posters and demos introduced in teaser sessions 1 and 2 are now on display.]

11:00-12:00 Invited keynote

Plenary hall

Tactile feedback in mobile devices

Piers Andrew (Nokia Research Center)

The near ubiquity of touchscreen inputs for mobile devices means that haptic feedback technologies are increasingly important. Various means of delivering such tactile feedback in mobile and portable devices will be discussed, and a recently developed Electrostatic Tactile (ET) feedback system providing programmable tactile feedback to mobile displays will be described. The ET system is a robust, thin, and optically transparent structure integrated on top of the display, and exploits



the well-known phenomenon of electrovibration to create a controllable frictional force between a user's fingertip and the surface. Localized tactile information is delivered to the user's skin directly and the magnitude and pattern of the frictional force experienced is correlated with displayed images and the touch location. A variety of different materials have been demonstrated, including those compatible with flexible devices, such as the Nokia Kinetic Device.

## 12:00-13:00 LUNCH

### 13:00-14:30 Session 1: Collaborative Haptics Plenary hall

Session chair: Jan Van Erp

- 13:00-13:15 A peer-to-peer Trilateral Passivity Control for delayed collaborative Teleoperation  
Michael Panzirsch, Jordi Artigas-Esclusa, Andreas Tobergte, Paul Kotyczka, Carsten Preusche, Alin Albu-Schaeffer & Gerd Hirzinger
- 13:15-13:30 Haptic communication tools for collaborative deformation of molecules  
Jean Simard & Mehdi Ammi
- 13:30-13:45 Perceptually Robust Traffic Control in Distributed Haptic Virtual Environments  
Clemens Schuwerk, Rahul Chaudhari & Eckehard Steinbach
- 13:45-14:00 Error-resilient Perceptual Haptic Data Communication based on Probabilistic Receiver State Estimation  
Julius Kammerl, Fernanda Brandi, Florian Schweiger & Eckehard Steinbach
- 14:00-14:15 Spectral Subtraction of Robot Motion Noise for Improved Vibrotactile Event Detection  
William McMahan & Katherine Kuchenbecker
- 14:15-14:30 Contact Force and Finger Angles Estimation for Touch Panel by Detecting Transmitted Light on Fingernail  
Yoichi Watanabe, Yasutoshi Makino & Katsunari Sato

### 14:30-15:00 Poster/demo teaser 2 Plenary hall

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|--|---|
| P034: Vertical Illusory Self-motion Through Haptic Stimulation of the Feet, Rolf Nordahl & Stefania Serafin  | proprioceptive weight perception, Wouter Bergmann Tiest, Connie Lyklema & Astrid Kappers  |
| P036: FootGlove: a haptic device supporting the customer in the choice of the best fitting shoes, Luca Greci | P038: Visualization of Tactile Material Relationships Using Sound Symbolic Words, Junji Watanabe, Tomohiko Hayakawa, Shigeru Matsui, Arisa Kano, Yuichiro Shimizu & Maki Sakamoto |
| P037: Investigating the effect of area of stimulation on cutaneous and                                       |   |

- D044: Cursor navigation using haptics for motion-impaired computer users, Christopher Asque, Andy Day & Stephen Laycock
- P045: Comparison of Extensive vs. Confirmation Haptic Interfaces with Two Levels of Disruptive Tasks, Toni Pakkanen, Roope Raisamo & Veikko Surakka
- P049: Acquisition of elastically deformable object model based on measurement, Koichi Hirota & Kazuyoshi Tagawa
- P053: Is the curvature in hand movements to haptic targets in the mid sagittal plane caused by a misjudgment in direction? Marieke van der Graaff, Eli Brenner & Jeroen B.J. Smeets
- P056: Exploring the Impact of Visual-Haptic Registration Accuracy in Augmented Reality, Chang-Gyu Lee, Ian Oakley & Jeha Ryu
- P058: Dissociation of vibrotactile frequency discrimination performances for supra-threshold and near-threshold vibrations, Scinob Kuroki, Junji Watanabe & Shin'ya Nishida
- P061: Tactile Apparent Motion between Both Hands Based on Frequency Modulation, Soo-Chul Lim, Dong-Soo Kwon & Joonah Park
- P062: Feasibility Study of Levels-of-Detail in Point-based haptic rendering, Shahram Payandeh & Wen Shi
- P067: An Ungrounded Pulling Force Feedback Device using Periodical Vibration-Impact, Takuya Shima & Kenjiro Takemura
- P068: Saliency-Driven Tactile Effect Authoring for Real-Time Visuotactile Feedback, Myongchan Kim, Sungkil Lee & Seungmoon Choi
- P151: Haptic stimulus for the discrimination between intrinsic properties of dynamic systems, Florimond Gueniat, Yoren Gaffary, Luc Pastur & Mehdi Ammi
- D134: NonVisNavi: Non-Visual Mobile Navigation Application for Pedestrians, Tomi Nukarinen, Roope Raisamo, Johannes Pystynen & Erno Mäkinen
- D136: A Dental Simulator for Training of Prevalent Interventions: Tooth Restoration and Ultrasonic Scaling, Kimin Kim, Jaehyun Cho, Jaihyun Kim & Jinah Park
- D141: Compressibility and Crushability Reproduction Through an Amorphous Haptic Interface, Amir Berrezag, Yon Visell & Vincent Hayward
- D142: RehApp – A Wearable Haptic System for Rehabilitation and Sports Training, Kalle Myllymaa, Roope Raisamo, Jani Lylykangas, Jani Heikkinen & Veikko Surakka
- D164: Multi-contact Vacuum-driven Tactile Display for Representing Forces Acting on Grasped Objects, Lope Ben Porquias, Masashi Konyo, Satoshi Tadokoro

15:00-16:00 Poster/demo session 2 & Coffee

Exhibit hall

[Posters and demos introduced in teaser sessions 1 and 2 are now on display.]

16:00-17:30 Session 2: Devices & Technology

Plenary hall

Session chair: Ki-Uk Kyung

16:00-16:15 Transparency Improvement in Haptic Devices with a Torque Compensator Using Motor Current  
Ozgur Baser, Erhan ilhan Konukseven & Hakan Gurocak

- 16:15-16:30 Novel Thin Electromagnetic System for creating Pushbutton Feedback in Automotive Applications  
Ingo Zoller, Peter Lotz & Thorsten Kern
- 16:30-16:45 Dynamics Modeling of an Encountered Haptic Interface for Ball Catching and Impact Tasks Simulation  
Massimiliano Solazzi, Dario Pellegrinetti, Paolo Tripicchio, Antonio Frisoli & Massimo Bergamasco
- 16:45-17:00 Development and Applications of High-Density Tactile Sensing Glove  
Takashi SAGISAKA, Yoshiyuki Ohmura, Yasuo Kuniyoshi, Akihiko Nagakubo & Kazuyuki Ozaki
- 17:00-17:15 Development of an Impact-Resonant Actuator for Mobile Devices  
Dongbum Pyo, Tae-Heon Yang, Semin Ryu, Byung-Kil Han, Jun Seok Park & Dong-Soo Kwon
- 17:15-17:30 Haptic Rendering of Cultural Heritage Objects at Different Scales  
Sreeni Kamalalayam Gopalan, Priyadarshini Kumari, Praseedha Krishnan & Subhasis Chaudhuri
- 18:30-21:00-22:00 City reception (at the Museum Centre Vapriikki)  
Media show at the New Factory

## THURSDAY 14.6.

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08:00 Registration opens

09:00-09:30 Poster/demo teaser 3

Plenary hall

P070: Contact Force During Active Roughness Perception, Yoshihiro Tanaka, Wouter Bergmann Tiest, Astrid Kappers & Akihito Sano

D086: Guiding tourists through haptic interaction: vibration feedback in the Lund Time Machine, Delphine Szymczak, Charlotte Magnusson & Kirsten Rasmus-Gröhn

D078: A Novel Miniature Kinaesthetic Tactile Actuator based on Magnetorheological Fluids, Tae-Heon Yang, Semin Ryu, Sang-Youn Kim, Jeong-Hoi Koo, Ki-Uk Kyung, Jinung An, Yon-Kyu Park & Dong-Soo Kwon

D089: New Control Architecture based on PXI for a 3-Finger Haptic Device Applied to Virtual Manipulation, Ignacio Galiana, Jose Breñosa, Jorge Barrio & Ferre Manuel

P081: Immersive Direct Touch Haptic Display, Maisarah Binti Ridzuan, Kenjiro Takemura & Yasutoshi Makino

P090: How finger movement speed affects Braille pattern recognition, Kensuke Oshima & Shigeru Ichihara

P082: Comparing Direct and Remote Tactile Feedback on Interactive Surfaces, Hendrik Richter, Sebastian Loehmann, Florian Weinhart & Andreas Butz

D091: Novel Interactive Techniques for Bimanual Manipulation of 3D Objects with Two 3DoF Haptic Interfaces,



Anthony Talvas, Maud Marchal, Clément Nicolas, Gabriel Cirio, Mathieu Emily & Anatole Lécuyer

P093: Interaction Power Flow Based Control of a 1-DOF Hybrid Haptic Interface, Carlos Rossa, José Lozada & Alain Micaelli

P099: Rediscovering the Haptic Sense Through Crossroads of Art and Design Research, Sandra Coelho

P101: Evaluating a Multipoint Tactile Renderer for Virtual Textured Surfaces, Matthew Philpott & Ian Summers

P110: Finger-Mounted Skin Vibration Sensor for Active Touch, Yoshihiro Tanaka, Yoshihiro Horita & Akihito Sano

P116: A Novel Stimulation Method Based on a Neuromorphic Mechanoreceptor Model for Haptic Illusion, Kiuk Gwak, Jun-Cheol Park & Dae-Shik Kim

P124: Rendering Stiffness with a Prototype Haptic Glove Actuated by an Integrated Piezoelectric Motor, Pontus Olsson, Stefan Johansson, Fredrik Nysjö & Ingrid Carlbom

09:30-10:30 Poster/demo session 3 & Coffee

Exhibit hall

[Posters and demos introduced in teaser sessions 3 and 4 are now on display.]

10:30-11:00 EuroHaptics Ph.D. award and the winner's presentation

Plenary hall

11:00-12:00 Invited keynote

Plenary hall

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### Social-haptic communication

Riitta Lahtinen (Finnish Deafblind Association) and Russ Palmer (SRAT(M), Music Therapist)

Haptices and haptemes are based on the PhD research of how dual-sensory impaired (deafblind) people can share environmental information interactively through touch. The presentation will include a brief description of longitudinal and developmental research on how to adapt visual and auditive information onto the body. The research is based on haptics and has been recognised as social-haptic communication (interaction between two or more people). This approach differs from haptic communication (object based contact).



The research describes haptices, touch-related messages, in different situations enhancing sensory information and functioning as an independent language. Haptices includes confirmation system, social quick messages, face expressions

and behaviour, body drawing, orientation and directional information, guiding and sharing art and hobby experiences by touch.

Haptics consist of haptemes; movements, change of directions, pressure, speed, frequency, size, length, duration, pause, change of rhythm, shape, macro and micro movements. This research classifies how the body can be identified into different areas such as body orientation, varied body postures and position levels, social actions and which side of the body is used.

When the hearing and sight deteriorates communication consists of multi-systematic and adaptive methods. A person's expressive language, spoken or sign language usually remains unchanged, but the methods of receiving information could change many times during a person's lifetime. Social-haptic communication system has expanded to other client groups such as visually impaired and profound learning disability around in Europe, Australia and Canada.

12:00-13:00 LUNCH

13:00-14:30 Session 3: Tactile Display & Tactile Sensing Plenary hall

Session chair: Hong Tan

- 13:00-13:15 Tradeoffs In The Application of Time-Reversed Acoustics to Tactile Stimulation  
Charles Hudin, José Lozada, Michael Wiertelwski & Vincent Hayward
- 13:15-13:30 Finite Element Modeling of a Vibrating Touch Screen Actuated by Piezo Patches for Haptic Feedback  
Buket Baylan, Ugur Aridogan & Cagatay Basdogan
- 13:30-13:45 Presentation of Sudden Temperature Change using Spatially Divided Warm and Cool Stimuli  
Katsunari Sato & Takashi Maeno
- 13:45-14:00 A Novel Approach for Pseudo-Haptic Textures Based on Curvature Information  
Ferran Argelaguet, David Antonio Gómez Jáuregui, Maud Marchal & Anatole Lécuyer
- 14:00-14:15 Indicating Wind Direction Using a Fan-Based Wind Display  
Takuya Nakano, Shota Saji & Yasuyuki Yanagida
- 14:15-14:30 Electrostatic Modulated Friction as Tactile Feedback: Intensity Perception  
Dinesh Wijekoon, Marta Cecchinato, Eve Hoggan & Jukka Linjama

14:30-15:00 Poster/demo teaser 4

Plenary hall

D127: Augmentation of Material Property by Modulating Vibration Resulting from Tapping, Taku Hachisu, Michi Sato & Shogo Fukushima

P129: Shaking a box to estimate the property of content, Yasuhiro Tanaka & Koichi Hirota

D138: Vibrotactile Stimulation Can Affect Auditory Loudness: A Pilot Study, Ryuta Okazaki, Hiroyuki Kajimoto & Vincent Hayward

P139: Utilizing Haptic Feedback in Drill Rigs, Tuuli Keskinen, Markku Turunen, Roope Raisamo, Grigori Evreinov & Eemeli Haverinen

P145: Hands Reaching Out of Dreamland: A Haptic Peripheral Alarm Clock, Erik Olierook & Mathias Funk

P146: **Evidence for 'Visual Enhancement of Touch' mediated by visual displays and its relationship with body ownership**, Valeria Bellan, Carlo Reverberi & Alberto Gallace

P147: Orientation inquiry: a new haptic interaction technique for non-visual pedestrian navigation, Roope Raisamo, Tomi Nukarinen, Johannes Pystynen, Erno Mäkinen & Johan Kildal

P150: Haptic Force Perception in Bimanual Manipulation, Jalal Awed, Imad Elhaji & Nadiya Slobodenyuk

D153: Development of Intuitive Tactile Navigational Patterns, Christos Giachritsis, Gary Randall & Samuel Roselier

P154: Stability of Model-Mediated Teleoperation: Discussion and Experiments. Bert Willaert, Hendrik Van Brussel & Günter Niemeyer

P156: Backwards Maneuvering Powered Wheelchairs with Haptic Guidance, Emmanuel Vander Poorten, Eric Demeester, Alexander Huntemann, Eli Reekmans, Johan Philips & Joris De Schutter

P158: Haptics in Between-Person Object Transfer, Satoshi Endo, Geoff Pegman, Mark Burgin, Tarek Tourni & Alan M. Wing

15:00-16:00 Poster/demo session 4 & Coffee

Exhibit hall

[The set of posters and demos on display is the same as in Poster/demo session 3, see above.]

16:00-17:30 Session 4: Perception & Psychophysics

Plenary hall

Session chair: Christos Giachritsis

16:00-16:15 What feels parallel strongly depends on hand orientation  
Astrid Kappers & Bart Liefers

16:15-16:30 On the Perceptual Artifacts Introduced by Packet Losses on the Forward Channel of Haptic Telemanipulation Sessions  
Fernanda Brandi, Burak Cizmeci & Eckehard Steinbach

16:30-16:45 Masking of Key-Click Feedback Signals on Two Fingers using Simple Clicks  
Jin Ryong Kim, Xiaowei Dai, Xiang Cao, Carl Picciotto, Desney Tan & Hong Tan

16:45-17:00 Modifying an Identified Angle of Edged Shapes Using Pseudo-Haptic Effects

Yuki Ban, Takashi Kajinami, Takuji Narumi, Tomohiro Tanikawa & Michitaka Hirose

- 17:00-17:15 The Effect of the Stiffness Gradient on the Just Noticeable Difference Between Surface Regions  
Umut Kocak, Karljohan Lundin Palmerius, Camilla Forsell & Matthew Cooper
- 17:15-17:30 Two hands perceive better than one  
Myrthe A. Plaisier & Marc O. Ernst

18:00- Late night sun cruise and conference dinner

## FRIDAY 15.6.

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08:00 Registration opens

08:30-09:30 EuroHaptics Society business meeting Plenary hall

09:00-10:30 Poster/demo session 5 & Media Exhibit hall

10:30-12:00 Session 5: Plenary hall  
Neuroscience and Medical & Rehabilitation Applications  
Session chair: Astrid Kappers

10:30-10:45 A Closed-loop Neurorobotic System for Investigating Braille-reading Finger Kinematics  
Jeremie Pinoteau, Luca Leonardo Bologna, Jesús Alberto Garrido & Angelo Arleo

10:45-11:00 Combining Brain-Computer and Haptic Interfaces: Detecting Mental Workload to Adapt Force-Feedback  
Laurent George, Maud Marchal, Loeiz GLONDU & Anatole Lécuyer

11:00-11:15 Cognitive load can explain differences in active and passive touch  
George Van Doorn, Vladimir Dubaj, Dianne Wuillemin, Barry Richardson & Mark Symmons

11:15-11:30 Discrimination of Springs with Vision, Proprioception, and Artificial Skin Stretch Cues  
Netta Gurari, Jason Wheeler, Amy Shelton & Allison Okamura

11:30-11:45 Tactile sensibility through tactile display: effect of the array density and clinical use  
Massimiliano Valente, Ferdinando Cannella, Lorenzo Scalise, Mariacarla Memeo, Paolo Liberini & Darwin Caldwell

11:45-12:00 Tactile Emotions: A Vibrotactile Tactile Gamepad for Transmitting Emotional Messages to Children with Autism  
Gwénaél Changeon, Delphine Graeff, Margarita Anastassova & José Lozada

12:00-13:00 LUNCH

13:00-14:00 Invited keynote

Plenary hall

The Design of Everyday Computational Things: Why Industrial Design is the New Interaction Design

Roel Vertegaal (Queen's University)

In his seminal book *The Psychology of Everyday Things*, Donald Norman outlined a world of things around us that are poorly designed because their designers did not apply psychology to the design process. The idea that psychologists can answer questions about design, through a user-



centered design process, is a thesis that has guided our field for several decades. However, if we examine what the world's top industrial designers, such as Yves Béhar, Jonathan Ive, Karim Rashid, and Philippe Starck, actually do, it becomes clear that they work quite differently. To them, thinking about function is like thinking intuitively about three-dimensional shapes. Interaction design is at the dawn of a new age: Flexible Organic Light Emitting Diodes (FOLEDs) and Flexible Electrophoretic Ink (E Ink) present a third revolution in display technologies that will greatly alter the way computer interfaces are designed. Instead of being constrained to the flat surfaces, we will have the ability to shrink-wrap displays around any three-dimensional object, and thus, potentially, every everyday thing. You will order your morning coffee through a display on the skin of your beverage container and your newspaper will be displayed on a flexible paper computer. These "computational things" will need to be designed by artists who understand three-dimensional form if they are truly to become everyday. Industrial designers will become the new interaction designers. This does not necessarily mean current interaction designers will lose their jobs, as our field will expand to address new markets. Interaction design will in fact be everywhere when computers become so ubiquitous they are just everyday computational things.

14:00-15:00 Session 6: Plenary hall  
Haptic Rendering and Multimodal Interaction

Session chair: Karljohan Palmerius

- 14:00-14:15 Two finger grasping simulation with cutaneous and kinesthetic force feedback  
Claudio Pacchierotti, Francesco Chinello, Monica Malvezzi, Leonardo Meli & Domenico Prattichizzo
- 14:15-14:30 Stable and Transparent Bimanual Six-Degree-of-Freedom Haptic Rendering Using Trust Region Optimization  
Thomas Knott, Yuen Law & Torsten Kuhlen
- 14:30-14:45 Feel the Static and Kinetic Friction  
Felix Hamza-Lup & William Baird
- 14:45-15:00 Inside the boundaries of the physical world: audio-haptic feedback as support for the navigation in virtual environments  
Luca Turchet, Niels Nilsson & Stefania Serafin

15:00-15:30 Award ceremony and Closing Plenary hall

15:30-15:50 Coffee

16:00 End of the main conference

16:30 Post-conference demo session at TAUCHI  
A guided tour to the TAUCHI labs. Demos and snacks are available.



TAUCHI labs are located at the Pinni B building, University of Tampere

# Social Events

## WEDNESDAY 13.6: CITY RECEPTION

The City of Tampere organizes a reception to the EuroHaptics 2012 conference visitors at Museum Centre Vapriikki.

A bus transfer will be organized from the conference venue Hotel Rosendahl to the reception at Vapriikki. Vapriikki is located on the banks of the Tammerkoski. It offers a variety of both permanent and varied themes including history, technology and natural sciences. The exhibitions are closed during the city reception but the visitors are welcome to visit the museum at their own time.

**20:45-21:45 Media Show at New Factory.** After City Reception, 120 visitors will have a great opportunity to visit to New Factory, a novel engine room of innovation. During the visit a short introduction of what New Factory is about will be given, followed by an exciting digital art performance. Some refreshments will be served.

## THURSDAY 14.6: CRUISE TO VIKINSAARI ISLAND

Conference participants are invited to a late night sun cruise to Viikinsaari Island, to enjoy the Finnish summer night and conference dinner in good company.

The cruise and the dinner are included in the conference fee. Extra tickets for your companions are available via conference registration and on-site on the conference registration desk (100 EUR per extra ticket).

The cruise boats (operated by Hopealinja) will pick you up at the boat dock near the conference venue.

## FRIDAY 15.6: TAUCHI OPEN HOUSE

After the official conference program has ended, the participants have a possibility to attend a guided tour to the TAUCHI labs. Demos and snacks are available.

The event is free of charge but requires registration (also possible on-site on the registration desk).

Busses will pick you up at the conference venue right after the last session and transfer you to the TAUCHI premises at the Pinni B Building, University of Tampere.

# Organizing Committee

## General co-chairs

Roope Raisamo, Head of TAUCHI Research Center, University of Tampere  
Kaisa Väänänen-Vainio-Mattila, Director of unit of Human-Centered Technology (IHTE), Tampere University of Technology  
Jyri Huopaniemi, Director and Head of Media Technologies Laboratory, Nokia Research Center

## Program co-chairs

Veikko Surakka, University of Tampere  
Vuokko Lantz, Nokia Research Center  
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## Demo chair

Markku Turunen, University of Tampere

## Poster chair

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## Workshop chair

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## Publication chair

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## Exhibit chair

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## Local arrangements

Päivi Majaranta, University of Tampere  
Teija Vainio, Tampere University of Technology

## Student volunteer chair

Thomas Olsson, Tampere University of Technology



# Program Committee

## Meta reviewers

Margarita Anastassova  
Monica Bordegoni  
Christos Giachritsis  
Matthias Harders  
Topi Kaaresoja  
Kyung Ki-Uk

Stephen Laycock  
Vincent Levesque  
Karljohan Lundin Palmerius  
David McGookin  
Haruo Noma  
Ian Oakley

Miguel Otaduy  
Jee-Hwan Ryu  
Ian Summers  
Mark Wright

## Referees

Marco Agus  
Fawaz Alsulaiman  
Hideyuki Ando  
Hichem Arioui  
Carlo Alberto Avizzano  
Mehmet Ayyildiz  
Jose M. Azorin  
Soledad Ballesteros  
Thorsten Behles  
Gianni Borghesan  
Diego Borro  
Andrea Brogni  
Ozkan Celik  
Nienke Debats  
Massimiliano Di Luca  
Knut Drewing  
Christian Duriez  
Marc Ernst  
Ildar Farkhatdinov  
Irene Fasiello  
Antonio Frisoli  
Ignacio Galiana  
Marcos Garcia  
Carlos Garre  
Daniel Gooch  
Florian Gosselin  
Burak Guclu  
Blake Hannaford  
Christian Hatzfeld

Vincent Hayward  
Sandra Hirche  
Joe Huegel  
Barry Hughe  
Rosa Iglesias  
Miriam Ittyerah  
Seokhee Jeon  
Li Jiang  
Lynette Jones  
Christophe Jouffrais  
Sang-Youn Kim  
Yoshihiro Kuroda  
Tomohiro Kuroda  
Hoi Fei Kwok  
Piet Lammertse  
Anatole Lecuyer  
Claudio Loconsole  
Javier López Martínez  
Charlotte Magnusson  
Ferre Manuel  
Davide Mazza  
Konstantinos Moustakas  
Mark Mulder  
Masashi Nakatani  
Verena Nitsch  
Keita Ono  
Krist Overvliet  
Miguel Angel Padilla-  
Castaneda

Volkan Patoglu  
Angelika Peer  
Carsten Preusche  
Stephane Regnier  
Miriam Reiner  
Sami Ronkainen  
Emanuele Ruffaldi  
Jose Maria Sabater  
Evren Samur  
Enzo Pasquale Scilingo  
Betty Semail  
Stefania Serafin  
Jeroen Smeets  
Allan Smith  
Hong Tan  
Nikos Tsagarakis  
Costas Tzafestas  
Sehat Ullah  
Frans C.T. van der Helm  
George Van Doorn  
Emmanuel Vander Poorten  
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Bert Willaert  
Harwin William  
Raul Wirz  
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Mounia Ziat

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## Floor plan

1-2 Plenary hall

3-5 Exhibition hall

7 Storage room

9 Speaker preparation room



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EuroHaptics 2012 Office:

eurohaptics2012-office@sis.uta.fi

Social media:

The official Twitter hashtag during the conference **#eurohaptics2012**

# Program at Glance

	Tuesday 12 June	Wednesday 13 June	Thursday 14 June	Friday 15 June	
08:00	Registration opens at the conference venue, Hotel Rosendahl				
08:30				EuroHaptics Society meeting	
09:00		Conference opening	Poster/demo teaser 3	Poster/demo session 5 & media & Coffee	
09:15		Poster/demo teaser 1	Poster/demo session 3 & Coffee		
09:30		Poster/demo session 1 & Coffee			
09:45		Poster/demo session 1 & Coffee	EuroHaptics Ph.D. award	Session 5: Neuroscience and Medical & Rehabilitation Applications	
10:30		Invited keynote by Piers Andrew	Invited keynote by Riitta Lahtinen and Russ Palmer		
11:00	Registration opens at Tampere University				
12:00		LUNCH	LUNCH	LUNCH	
13:00	Workshop: TECHTILE toolkit  Workshop: Smart traffic  Workshop: Multi-finger haptic interaction	Session 1: Collaborative Haptics	Session 3: Tactile Display & Tactile Sensing	Invited keynote by Roel Vertegaal	
14:00				Session 6: Haptic Rendering and Multimodal Interaction	
14:30			Poster/demo teaser 2	Poster/demo teaser 4	Award ceremony and Closing Coffee
15:00			Poster/demo session 2 & Coffee	Poster/demo session 4 & Coffee	
15:30					End of the main conference
16:00			Session 2: Devices & Technology	Session 4: Perception & Psychophysics	
16:30				Post-conference demo session: TAUCHI open house	
17:00					
17:30			Late night sun cruise and conference dinner		
18:00		City reception & New Factory			