Tuesday, March 17

15:00-17:00 Tours of haptics labs at the University of Utah
18:00-20:00 Conference reception at the hotel

Wednesday, March 18

09:00-09:15 Opening and Welcome

<table>
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<tr>
<th>Time</th>
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<tr>
<td>09:15</td>
<td>WeA1</td>
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<tr>
<td>09:15</td>
<td>Tactile Displays 1 (Oral)</td>
<td>WeA1.1</td>
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<tr>
<td>09:15-09:30</td>
<td>Realization of Button Click Feeling by Use of Ultrasonic Vibration and Force Feedback</td>
<td>WeA1.1</td>
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<td>09:15-09:30</td>
<td>Tashiro, Kaoru</td>
<td>Keio Univ.</td>
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<td>09:15-09:30</td>
<td>Shiokawa, Yuta</td>
<td>Keio Univ.</td>
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<td>09:15-09:30</td>
<td>Aono, Tomotake</td>
<td>Kyocera</td>
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<td>09:15-09:30</td>
<td>Maeno, Takashi</td>
<td>Keio Univ.</td>
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<td>09:30-09:45</td>
<td>A Body-conforming Tactile Jacket to Enrich Movie Viewing</td>
<td>WeA1.2</td>
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<td>09:30-09:45</td>
<td>Lemmens, Paul M. C.</td>
<td>Philips Res. Europe</td>
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<td>09:30-09:45</td>
<td>Crompoets, Floris</td>
<td>Philips Res. Europe</td>
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<td>09:30-09:45</td>
<td>Brokken, Dirk</td>
<td>Philips Res. Europe</td>
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<td>09:30-09:45</td>
<td>Van den Eerenbeemd, Jack</td>
<td>Philips Res. Europe</td>
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<td>09:30-09:45</td>
<td>De Vries, Gert-Jan</td>
<td>Philips Res. Europe</td>
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<tr>
<td>09:45-10:00</td>
<td>Development of a Miniature Pin-Array Tactile Module Using Elastic and Electromagnetic Force for Mobile Devices</td>
<td>WeA1.3</td>
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<td>09:45-10:00</td>
<td>Yang, Tae-Heon</td>
<td>KAIST</td>
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<td>09:45-10:00</td>
<td>Kim, Sang-Youn</td>
<td>Korea Univ. of Tech. and Education</td>
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<td>09:45-10:00</td>
<td>Kim, Chong Hui</td>
<td>Agency for Defense Development</td>
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<td>09:45-10:00</td>
<td>Kwon, Dong-Soo</td>
<td>KAIST</td>
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<td>09:45-10:00</td>
<td>Book, Wayne</td>
<td>Georgia Inst. of Tech.</td>
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<td>10:00-10:15</td>
<td>ShiverPad: A Device Capable of Controlling Shear Force on a Bare Finger</td>
<td>WeA1.4</td>
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<tr>
<td>10:00-10:15</td>
<td>Chubb, Erik Christopher</td>
<td>Northwestern Univ.</td>
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<td>10:00-10:15</td>
<td>Colgate, J. Edward</td>
<td>Northwestern Univ.</td>
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<td>10:00-10:15</td>
<td>Peshkin, Michael A.</td>
<td>Northwestern Univ.</td>
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10:15-10:45 Morning break

10:45-11:45 Neuroscience and Haptics (invited session)

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<td>10:45-10:55</td>
<td>Introduction to Neuroscience Research in Haptics</td>
<td>MIT</td>
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<td>10:55-11:20</td>
<td>Neural Mechanisms of Haptic Size and Shape Perception</td>
<td>Johns Hopkins University</td>
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<td>11:20-11:45</td>
<td>Haptic Motor Control: Comparing Actual and Expected Somatosensory Feedback</td>
<td>University of Minnesota</td>
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11:45-13:15 Lunch

13:15-14:15 Poster Teasers 1

14:15-15:45 Poster Session 1
On-Line Precomputation Algorithm for Real-Time Haptic Interaction with Non-Linear Deformable Bodies
Filipovic, Jiri
Peterlik, Igor
Matyska, Ludek
14:15-15:45
PhyNeSS: A Physics-Driven Neural Networks-Based Surgery Simulation System with Force Feedback
Deo, Dhananjay
De, Suvranu
14:15-15:45
Data-Driven Haptic Modeling Using Polynomial Hypersurfaces,
Theodosius, Paul
Colton, Mark
14:15-15:45
Computationally Efficient Techniques for Data-Driven Haptic Rendering
Hoever, Raphael
Di Luca, Massimiliano
Szekely, Gabor
Harders, Matthias
14:15-15:45
Homotopy Switching Model for Dyad Haptic Interaction in Physical Collaborative Tasks
Evrard, Paul
Kheddar, Abderrahmane
14:15-15:45
Role Determination in Human-Human Interaction
Stefanov, Nikolay
Peer, Angelika
Buss, Martin
14:15-15:45
Maneuverability of Master Control Devices Considering the Musculo-Skeletal Model of an Operator
Ito, Sho
Yokokohji, Yasuyoshi
14:15-15:45
Control Strategies and Perception Effects in Co-Located and Large Workspace Dynamical Encountered Haptics
Tripicchio, Paolo
Ruffaldi, Emanuele
Avizzano, Carlo Alberto
Bergamasco, Massimo
14:15-15:45
Small and Lightweight Tactile Display and Its Application
Kim, Seung-Chan
Yang, Tae-Heon
Han, Byung-Kil
Kim, Chong Hui
14:15-15:45
Determining Appropriate Parameters to Elicit Linear and Circular Apparent Motion Using Vibrotactile Cues
Niwa, Masataka
Lindeman, Robert
Itoh, Yuichi
Kishino, Fumio
14:15-15:45
Vibrotactile Display for Hand-Held Input Device Providing Spatial and Directional Information
Yang, Gi-Hun
Ryu, Dongseok
Kang, Sungchul
14:15-15:45
Piezoelectric Actuator for a Force-Feedback Application: Preliminary Evaluation
M’Boungui, Gaston
Lemaire-Semail, Betty
Giraud, Frederic
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<td>14:15-15:45</td>
<td>WeC4</td>
<td>WeC4.1</td>
<td>Compact MR-Brake with Serpentine Flux Path for Haptics Applications</td>
<td>Senkal, Doruk, Washington State Univ. Vancouver, Gurocak, Hakan, Washington State Univ. Vancouver</td>
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<td></td>
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<td>Efficient Object Exploration and Object Presentation in TeleTA, Teleoperation System with Tactile Feedback</td>
<td>Tsetserukou, Dzmitry, The Univ. of Tokyo, Tachi, Susumu, The Univ. of Tokyo, Gurocak, Hakan, Washington State Univ. Vancouver</td>
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<td>Ergonomics of Exoskeletons: Objective Performance Metrics</td>
<td>Schiele, Andre, European Space Agency</td>
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<td>System Improvements in Mobile Haptic Interface</td>
<td>Lee, In, POSTECH, Hwang, Inwook, POSTECH, Han, Kyung Lyong, POSTECH, Choi, Oh Kyu, POSTECH, Choi, Seungmoon, POSTECH, Lee, Jin S.</td>
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<td>14:15-15:45</td>
<td>WeC5</td>
<td>WeC5.1</td>
<td>Effects of Haptic Device Attributes on Vibration Detection Thresholds</td>
<td>Salisbury, Curt, Stanford Univ., Gillespie, Brent, Univ. of Michigan, Tan, Hong, Purdue Univ., Barbagli, Federico, Stanford Robotics Lab., Salisbury, Kenneth, Stanford Univ.</td>
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<td>Stiffness Discrimination with Visual and Proprioceptive Cues</td>
<td>Gurari, Netta, Johns Hopkins Univ., Kuchenbecker, Katherine J., Univ. of Pennsylvania, Okamura, Allison M.</td>
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<td>14:15-15:45</td>
<td>WeC6</td>
<td>WeC6.1</td>
<td>How Is Tactile Timing Information Integrated: Somatotopically or Spatiotopically?</td>
<td>Kuroki, Shinobu, The Univ. of Tokyo, Watanabe, Junji, NTT Communication, Kawakami, Naoki, The Univ. of Tokyo, Tachi, Susumu, The Univ. of Tokyo</td>
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<td>Evidence for Haptic Iconic Memory</td>
<td>Shih, Ron, Univ. of Waterloo, Dubrowski, Adam, Univ. of Toronto, Carnahan, Heather, Univ. of Toronto</td>
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<td>14:15-15:45</td>
<td>WeC6</td>
<td>WeC6.2</td>
<td>Effects of Sounds on Tactile Roughness Depend on the Congruency between Modalities</td>
<td>Suzuki, Yuika, Tohoku Univ., Gyoba, Jiro, Tohoku Univ.</td>
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<td>14:15-15:45</td>
<td>WeC6</td>
<td>WeC6.3</td>
<td>The Impact of Feedback Design in Haptic Volume Visualization</td>
<td>Lundin Palmerius, Karlijohan, Linköping Univ., Forsell, Camilla, Linköping Univ.</td>
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</table>
15:45-16:15 Coffee break

WeD1  Perception 3 (Oral)  Room
16:15-16:30  WeD1.1  Tactile Displays for Multitask Environments: The Role of Concurrent Task Processing Code
Ferris, Thomas  Univ. of Michigan
Hameed, Shameem  Univ. of Michigan
Sarter, Nadine  Univ. of Michigan

16:30-16:45  WeD1.2  ERP Evidence of Tactile Texture Processing: Effects of Roughness and Movement
Ballesteros, Soledad  Univ. Nacional de Educación a Distancia
Muñoz, Francisco  Univ. Nacional de Educación a Distancia
Sebastián, Manuel  Univ. Nacional de Educación a Distancia
García, Beatriz  Univ. Nacional de Educación a Distancia
Reales, José Manuel  Univ. Nacional de Educación a Distancia

16:45-17:00  WeD1.3  Communication of Direction through Lateral Skin Stretch at the Fingertip
Gleeson, Brian  Univ. of Utah
Horschel, Scott  Univ. of Utah
Provancher, William  Univ. of Utah

Thursday March 19

ThA1  Haptically-Enhanced Applications 1 (Oral)  Room
09:00-09:15  ThA1.1  Wind Display Device for Locomotion Interface in a Virtual Environment
Kulkarni, Sandip  Univ. of Utah
Fisher, Charles  Univ. of Utah
Pardyjak, Eric  Univ. of Utah
Minor, Mark  Univ. of Utah
Hollerbach, John  Univ. of Utah

09:15-09:30  ThA1.2  Gait Enhancing Mobile Shoe (GEMS) for Rehabilitation
de Groot, Allison  Virginia Commonwealth Univ.
Decker, Ryan  Johns Hopkins Univ.
Reed, Kyle Brandon  Johns Hopkins Univ.

09:30-09:45  ThA1.3  Haptic Interface for Perceiving Remote Object Using a Laser Range Finder
Yano, Hiroaki  Univ. of Tsukuba
Miyamoto, Yuichi  Univ. of Tsukuba
Iwata, Hiroo  Univ. of Tsukuba

09:45-10:00  ThA1.4  Precise Manipulation of GUI on a Touch Screen with Haptic Cues
Kyung, Ki-Uk  Electronics and Telecommunications Res. Inst.
Srinivasan, Mandayam  MIT
Lee, Jun-Young  KIST

10:00-10:30 Morning break

ThB1  Telemanipulation and Telepresence (Oral)  Room
10:30-10:45  ThB1.1  Perceptual Coding of Haptic Data in Time-Delayed Teleoperation
Vittorias, Iason  Tech. Univ. München
Kammerl, Julius  Tech. Univ. München
Hirche, Sandra  Tech. Univ. München
Steinbach, Eckehard  Tech. Univ. München

10:45-11:00  ThB1.2
Robust Perception-Based Data Reduction and Transmission in Telehaptic Systems
Sakr, Nizar
Zhou, Jilin
Georganas, Nicolas D.
Zhao, Jiyong
Petriu, Emil M.
Univ. of Ottawa
Univ. of Ottawa
Univ. of Ottawa
Univ. of Ottawa
Univ. of Ottawa

11:00-11:15
Least Conservative Robust Stability Condition for Linear Bilateral Teleoperation Control Systems
Haddadi, Amir
Hashtrudi-Zaad, Keyvan
Queen's Univ.
Queen's Univ.

11:15-11:30
Position and Force Augmentation in a Telepresence System and Their Effects on Perceived Realism
Weber, Carolina
Nitsch, Verena
Unterhinninghofen, Ulrich
Färber, Berthold
Buss, Martin
Tech. Univ. München
Univ. der Bundeswehr München
Tech. Univ. München
Univ. der Bundeswehr München
Tech. Univ. München

11:30-13:00 Lunch

13:00-14:00 Poster Teasers 2

14:00-15:30 Poster Session 2 and Demo Session 1

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<td>ThC1</td>
<td>Haptically-Enhanced Applications 2 (Poster)</td>
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<td>14:00-15:30</td>
<td>ThC1</td>
<td>Haptic Exploration of an Unsteady Flow</td>
<td>Menelas, Bob CNRS-LIMSI</td>
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<td>14:00-15:30</td>
<td>ThC1</td>
<td>Development of Tremor-Suppression Filter for Meal-Assist Robot</td>
<td>Ohara, Eiichi Gifu Univ.</td>
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<td>14:00-15:30</td>
<td>ThC1</td>
<td>Method for Presenting Virtual Objects to Multiple Fingers on Two-Hands Using Multiple Single-Point Haptic Devices</td>
<td>Handa, Takuya NHK (Japan Broadcasting Corp.</td>
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<td>14:00-15:30</td>
<td>ThC1</td>
<td>Pneumatic Haptic Interface Fuzzy Controller for Simulation of Abdominal Palpations During Colonoscopy</td>
<td>Cheng, Mario The Univ. of Queensland</td>
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<td>14:00-15:30</td>
<td>ThC1</td>
<td>Non-Contact Tactile Sensation Synthesized by Ultrasound Transducers</td>
<td>Hoshi, Takayuki Univ. of Tokyo</td>
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<td>14:00-15:30</td>
<td>ThC1</td>
<td>A High Fidelity Ungrounded Torque Feedback Device: The Itorqu 2.0</td>
<td>Winfree, Kyle N. Univ. of Pennsylvania</td>
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<td>14:00-15:30</td>
<td>ThC1</td>
<td>Toward Iconic Vibrotactile Information Display Using Floor Surfaces</td>
<td>Visell, Yon McGill Univ.</td>
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ThC2

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<td>ThC2</td>
<td>Device Design and Applications (Posters with demos)</td>
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<tr>
<td>14:00-15:30</td>
<td>ThC2</td>
<td>Non-Contact Tactile Sensation Synthesized by Ultrasound Transducers</td>
<td>Hoshi, Takayuki Univ. of Tokyo</td>
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<td>14:00-15:30</td>
<td>ThC2</td>
<td>A High Fidelity Ungrounded Torque Feedback Device: The Itorqu 2.0</td>
<td>Winfree, Kyle N. Univ. of Pennsylvania</td>
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<td>14:00-15:30</td>
<td>ThC2</td>
<td>Toward Iconic Vibrotactile Information Display Using Floor Surfaces</td>
<td>Visell, Yon McGill Univ.</td>
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Law, Alvin
Cooperstock, Jeremy R.

14:00-15:30
ThC2.4
The Ultimate Haptic Device: First Step
Millet, Guillaume
Haliyo, Dogan Sinan
Régnier, Stéphane
Hayward, Vincent

14:00-15:30
ThC2.5
Toward Tactilely Transparent Gloves: Collocated Slip Sensing and Vibrotactile Actuation
Romano, Joseph M.
Gray, Steven R.
Jacobs, Nathan T.
Kuchenbecker, Katherine J.

ThC3
Room
Tactile Displays 3 (Poster)
14:00-15:30
ThC3.1
Good Vibrations: Asymmetric Vibrations for Directional Haptic Cues
Tappeiner, Hanns
Klatzky, Roberta
Unger, Bertram
Hollis, Ralph

14:00-15:30
ThC3.2
Dielectric Elastomer Actuators for Tactile Displays
Matysek, Marc
Lotz, Peter
Winterstein, Thomas
Schlaak, Helmut F.

14:00-15:30
ThC3.3
Tactile Object Exploration Using Cursor Navigation Sensors
Kraft, Dirk
Bierbaum, Alexander
Kjaergaard, Morten
Ratkevicius, Jurgis
Kjær-Nielsen, Anders
Ryberg, Charlotte
Petersen, Henrik Gordon
Asfour, Tamim
Dillmann, Rüdiger
Krüger, Norbert

14:00-15:30
ThC3.4
Vibrotactile Score: A Score Metaphor for Designing Vibrotactile Patterns
Lee, Jaebong
Ryu, Jonghyun
Choi, Seungmoon

ThC4
Room
Dynamics and Control 1 (Poster)
14:00-15:30
ThC4.1
An Adaptive Controller for Bilateral Teleoperation under Time Delay
Shahdi, Ali
Sirouspour, Shahin

14:00-15:30
ThC4.2
Control of an Actuated Car Door Providing Outstanding Haptic Interaction
Strolz, Michael
Möröt, Alexander
Graef, Michael
Buss, Martin

14:00-15:30
ThC4.3
An Energy Bounding Approach for Directional Transparency in Multiple Degree-Of-Freedom Haptic Interaction
Kim, Jaeha
Kim, Jong-Phil
Seo, Changhoon
Ryu, Jeha

14:00-15:30
ThC4.4
Recovering Haptic Performance by Relaxing Passivity Requirements
Griffiths, Paul
Gillespie, Brent
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<td>ThC5.1</td>
<td>Progressive Shared Control for Training in Virtual Environments</td>
<td>Li, Yanfang (Rice Univ.)</td>
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<td>Huegel, Joel C. (Rice Univ.)</td>
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<td>Patoglu, Volkan (Sabanci Univ.)</td>
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<td>O'Malley, Marcia (Rice Univ.)</td>
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<td>14:00-15:30</td>
<td>ThC5.2</td>
<td>Performance Related Energy Exchange in Haptic Human-Human Interaction in a Shared Virtual Object Manipulation Task</td>
<td>Feth, Daniela (Tech. Univ. München)</td>
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<td>Groten, Raphaela (Tech. Univ. München)</td>
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<td>Peer, Angelika (Tech. Univ. München)</td>
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<td>Hirche, Sandra (Tech. Univ. München)</td>
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<td>Buss, Martin (Tech. Univ. München)</td>
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<td>14:00-15:30</td>
<td>ThC5.3</td>
<td>Effects of Magnitude and Phase Cues on Human Motor Adaptation</td>
<td>Israr, Ali (Rice Univ.)</td>
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<td>Kapson, Hakan (Sabanci Univ.)</td>
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<td>O'Malley, Marcia (Rice Univ.)</td>
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<td>14:00-15:30</td>
<td>ThC5.4</td>
<td>Vibrotactile Perception Assessment for a Rowing Training System</td>
<td>Ruffaldi, Emanuele (Scuola Superiore S. Anna)</td>
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<td>Filippeschi, Alessandro (Scuola Superiore S. Anna)</td>
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<td>Sandoval, Oscar (Scuola Superiore S. Anna)</td>
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<td>Frisoli, Antonio (Scuola Superiore S. Anna)</td>
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<td>Avizzano, Carlo Alberto (Scuola Superiore S. Anna)</td>
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<td>Bergamasco, Massimo (Scuola Superiore S. Anna)</td>
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<td>ThC6.1</td>
<td>Haptics As an Aid to Copying for People with Williams Syndrome</td>
<td>Lee, Jin (Johns Hopkins Univ.)</td>
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<td>Okamura, Allison M. (Johns Hopkins Univ.)</td>
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<td>Landau, Barbara (Johns Hopkins Univ.)</td>
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<td>14:00-15:30</td>
<td>ThC6.2</td>
<td>Improving Haptic Experience through Biomechanical Measurements</td>
<td>Kocherry, John (SUNY, Univ. at Buffalo)</td>
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<td>Srinathveeravalli, Govindarajan (SUNY, Univ. at Buffalo)</td>
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<td>Chowiappa, Ashinwad (SUNY, Univ. at Buffalo)</td>
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<td>Kesavadas, Thenkurussi (SUNY, Univ. at Buffalo)</td>
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<td>Shin, Gwanseob (SUNY, Univ. at Buffalo)</td>
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<td>14:00-15:30</td>
<td>ThC6.3</td>
<td>Toward a Robot-Assisted Assessment of the Control Processes of the Motor System</td>
<td>Méary, David (San Raffaele Vita-Salute Univ.)</td>
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<td>Baud-bovy, Gabriel (San Raffaele Vita-Salute Univ.)</td>
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<td>14:00-15:30</td>
<td>ThC6.4</td>
<td>An HMM Approach to Realistic Haptic Human-Robot Interaction</td>
<td>Wang, Zheng (Tech. Univ. München)</td>
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<td>Peer, Angelika (Tech. Univ. München)</td>
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<td>Buss, Martin (Tech. Univ. München)</td>
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<th>Time</th>
<th>ThCT1 Room</th>
<th>Event</th>
<th>Authors</th>
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<tbody>
<tr>
<td>14:00-15:30</td>
<td>ThCT1.1</td>
<td>Intravascular Palpation and Haptic Feedback During Angioplasty</td>
<td>Meiss, Thorsten (Univ. of Tech. Darmstadt)</td>
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<td>Budelmann, Christoph (Univ. of Tech. Darmstadt)</td>
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<td>Kern, Thorsten Alexander (Univ. of Tech. Darmstadt)</td>
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<td>Sindlinger, Stephanie (Univ. of Tech. Darmstadt)</td>
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<td>Werthschützky, Roland (Univ. of Tech. Darmstadt)</td>
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<td>Minamisava, Carlos (Univ. of Tech. Darmstadt)</td>
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<td>14:00-15:30</td>
<td>ThCT1.2</td>
<td>A New Softness Display Based on Bi-Elastic Fabric</td>
<td>Bianchi, Matteo (Univ. of Pisa)</td>
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<td>Scilingo, Enzo Pasquale (Univ. of Pisa)</td>
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<td>Serio, Alessandro (Univ. of Pisa)</td>
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</table>
Bicchi, Antonio  
**Univ. of Pisa**  
14:00-15:30  
**ThCT1.3**

**Haptic Augmented Reality: Modulation of Real Object Stiffness**
Jeon, Seokhee  
Choi, Seungmoon  

14:00-15:30  
**ThCT1.4**

**Dynamic Touch on Friction Controlled Tactile Display**
Vanbelleghem, Romuald  
Giraud, Frederic  
Lemaire-Semail, Betty  

14:00-15:30  
**ThCT1.5**

**Graphical Authoring Tools for Vibrotactile Patterns**
Lee, Jaebong  
Ryu, Jonghyun  
Choi, Seungmoon  

14:00-15:30  
**ThCT1.6**

**Development of a Haptic Environment for Biomedical Engineering Simulation (An Educational Software to Help Demonstrate a Virtual Human Torso Model)**
Vahedi, Behrad  
Tiu, William  

14:00-15:30  
**ThCT1.7**

**A User-Centered Designed FOSS Implementation of Bone Surgery Simulations**
Forslund, Jonas  
Salinás, Eva-Lotta  
Lundin Palmerius, Karljohan  

14:00-15:30  
**ThCT1.8**

**Six-DoF Haptic Rendering of Contact between Geometrically Complex Reduced Deformable Models: Haptic Demo**
Barbic, Jernej  
James, Doug L.  

14:00-15:30  
**ThCT1.9**

**Inverse Piano Technique for Studying Finger Interaction During Pressing Tasks**
Martin, Joel  
Zatsiorsky, Vladimir  
Latash, Mark  

14:00-15:30  
**ThCT1.10**

**Collaborative Haptic Environment Assessment**
Hamza-Lup, Felix  
LaPlant, James  
Lambeth, Benjamin  

14:00-15:30  
**ThCT1.11**

**Visual versus Haptic Progressive Guidance for Training in a Virtual Dynamic Task**
Huegel, Joel C.  
O'Malley, Marcia  

15:30-16:00 Coffee break

**ThD1**  
**Room**  
**Human Performance 3 (Oral)**  

16:00-16:15  
**ThD1.1**

**Functional Analysis of Finger Contact Locations During Grasping**
Ciocarlie, Matei  
Dang, Hao  
Lukos, Jamie R  
Santello, Marco  
Allen, Peter  

16:15-16:30  
**ThD1.2**

**Force & Torque Feedback vs Force Only Feedback**
Verner, Lawton  
Okamura, Allison M.  

16:30-16:45  
**ThD1.3**

**3-D Force Control on the Human Fingerpad Using a Magnetic Levitation Device for Fingemal Imaging Calibration**
Grieve, Thomas  
Sun, Yu  
Hollerbach, John  
Mascaro, Stephen  

16:45-17:00  
**ThD1.4**

**The Role of Item Fixation in Haptic Search**
Plaisier, Myrthe  

15:30-16:00 Coffee break
Friday March 20

FrA1

Haptic Modeling and Rendering 2 (Oral)

09:00-09:15 FrA1.1
Haptic Rendering of Complex Deformations through Handle-Space Force Linearization
Garre, Carlos
URJC Madrid
Otaduy, Miguel A.
URJC Madrid

09:15-09:30 FrA1.2
A Data Compression Method for Impulse Response Deformation Model
Tagawa, Kazuyoshi
The Univ. of Tokyo
Hirota, Koichi
The Univ. of Tokyo
Hirose, Michitaka
The Univ. of Tokyo

09:30-09:45 FrA1.3
Toward Automated Haptic Modeling Using Commercial Haptic Interfaces: Surface Normal Estimation and Static Model Identification
Judd, Mark
Brigham Young Univ.
Colton, Mark
Brigham Young Univ.
Brown, Travis
Brigham Young Univ.

09:45-10:00 FrA1.4
Real-Time Estimation of Human Impedance for Haptic Interfaces
Hill, Matthew
Stanford Univ.
Niemeyer, Gunter
Stanford Univ.

10:00-10:30 Morning break

FrB1

Haptic Device Design 2 (Oral)

10:30-10:45 FrB1.1
A Whole-Arm Tactile Display System
Howe, Robert D.
Harvard Univ.
Tadakuma, Riichiro
Harvard Univ.

10:45-11:00 FrB1.2
A Haptic Device DELTA-4: Kinematics and Its Analysis
Arata, Jumpei
Nagoya Inst. of Tech.
Kondo, Hiroyuki
Nagoya Inst. of Tech.
Sakaguchi, Masamichi
Nagoya Inst. of Tech.
Fujimoto, Hideo
Nagoya Inst. of Tech.

11:00-11:15 FrB1.3
Five-Fingered Haptic Interface Robot: HIRO III
Endo, Takahiro
Gifu Univ.
Kawasaki, Haruhisa
Gifu Univ.
Mouri, Tetsuya
Gifu Univ.
Doi, Yasutoshi
Gifu Univ.
Yoshida, Tetsunori
Gifu Univ.
Ishigure, Yasuhiro
Marutomi Seikou Co., Ltd.
Shimomura, Hisayuki
Dainichi Co., Ltd.
Matsumura, Masato
e-Valley Co. Ltd.
Koketsu, Kazumi
Tec Gihan Co., Ltd.

11:15-11:30 FrB1.4
A Wearable Skin Stretch Device for Haptic Feedback
Bark, Karlin
Stanford Univ.
Wheeler, Jason
Stanford Univ.
Lee, Gayle
Stanford Univ.
Savall, Joan
Univ. of Navarra
Cutkosky, Mark
Stanford Univ.

11:30-13:00 Lunch

13:00-14:00 Poster Teasers 3
### 14:00-15:30 Poster Session 3 and Demo session 2

#### FrC1

**Tactile Modeling (Poster)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
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<tbody>
<tr>
<td>14:00-15:30</td>
<td><em>Influence of Contact Conditions on Thermal Responses of the Hand</em></td>
<td>Galie, Jessica; Ho, Hsin-Ni; Jones, Lynette</td>
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<tr>
<td></td>
<td><em>Providing Two-Dimensional Tactile Directional Information with One-Dimensional Movement</em></td>
<td>Lylykangas, Jani Kristian; Surakka, Veikko; Rantala, Jussi; Raisamo, Roope</td>
</tr>
</tbody>
</table>

**Room FrC1.1**

- *Influence of Contact Conditions on Thermal Responses of the Hand*
  - Galie, Jessica; Ho, Hsin-Ni; Jones, Lynette

**Room FrC1.2**

- *Providing Two-Dimensional Tactile Directional Information with One-Dimensional Movement*
  - Lylykangas, Jani Kristian; Surakka, Veikko; Rantala, Jussi; Raisamo, Roope

#### FrC2

**Haptic Modeling and Rendering 3 (Poster)**

<table>
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<th>Time</th>
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<tr>
<td>14:00-15:30</td>
<td><em>Designing 6DOF Haptic Transfer Functions for Effective Exploration of 3D Diffusion Tensor Fields</em></td>
<td>Ogawa, Yuta; Fujishiro, Issei; Suzuki, Yasuko; Takeshima, Yuriko</td>
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<td></td>
<td><em>Improved Feature Detection Over Large Force Ranges Using History Dependent Transfer Functions</em></td>
<td>Bivall Persson, Petter; Höst, Gunnar E.; Cooper, Matthew David; Tibell, Lena Anna Elisabet; Ynnerman, Anders</td>
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<tr>
<td></td>
<td><em>Dynamic Coupling Haptic Suturing Based on Orthogonal Decomposition</em></td>
<td>Sepulveda-Cervantes, Gabriel; Parra Vega, Vicente; Dominguez-Ramirez, Omar Arturo</td>
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<td></td>
<td><em>Bilateral Energy Transfer for High Fidelity Haptic Telemanipulation</em></td>
<td>Artigas, Jordi; Borghesan, Gianni; Preusche, Carsten; Melchiorri, Claudio; Hirzinger, Gerd</td>
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</table>

**Room FrC2.1**

- *Designing 6DOF Haptic Transfer Functions for Effective Exploration of 3D Diffusion Tensor Fields*
  - Ogawa, Yuta; Fujishiro, Issei; Suzuki, Yasuko; Takeshima, Yuriko

**Room FrC2.2**

- *Improved Feature Detection Over Large Force Ranges Using History Dependent Transfer Functions*
  - Bivall Persson, Petter; Höst, Gunnar E.; Cooper, Matthew David; Tibell, Lena Anna Elisabet; Ynnerman, Anders

**Room FrC2.3**

- *Dynamic Coupling Haptic Suturing Based on Orthogonal Decomposition*
  - Sepulveda-Cervantes, Gabriel; Parra Vega, Vicente; Dominguez-Ramirez, Omar Arturo

**Room FrC2.4**

- *Bilateral Energy Transfer for High Fidelity Haptic Telemanipulation*
  - Artigas, Jordi; Borghesan, Gianni; Preusche, Carsten; Melchiorri, Claudio; Hirzinger, Gerd

#### FrC3

**Perception and Design (Poster)**

<table>
<thead>
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<th>Time</th>
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<tr>
<td>14:00-15:30</td>
<td><em>Assessment of Haptics-Based Interaction for Assembly Tasks in Virtual Reality</em></td>
<td>Vo, Dao; Vance, Judy; Marasinghe, Mervyn</td>
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<td><em>Multidimensional Visual Aid Enhances Haptic Training Simulations</em></td>
<td>Halabi, Osama; Chiba, Norishige</td>
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<td><em>Perceptually Augmented Simulator Design through Decomposition</em></td>
<td>Edmunds, Timothy; Pai, Dinesh K.</td>
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</table>

**Room FrC3.1**

- *Assessment of Haptics-Based Interaction for Assembly Tasks in Virtual Reality*
  - Vo, Dao; Vance, Judy; Marasinghe, Mervyn

**Room FrC3.2**

- *Multidimensional Visual Aid Enhances Haptic Training Simulations*
  - Halabi, Osama; Chiba, Norishige

**Room FrC3.3**

- *Perceptually Augmented Simulator Design through Decomposition*
  - Edmunds, Timothy; Pai, Dinesh K.
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<tr>
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<td>Datta, Amitava Univ. of Western Australia</td>
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<td>14:00-15:30</td>
<td>FrC4</td>
<td>Haptic Device Design 3 (Poster)</td>
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<td>Extending the Motion Ranges of Magnetic Levitation for Haptic Interaction</td>
<td>Berkelman, Peter Univ. of Hawaii-Manoa</td>
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<td>Dzadovsky, Michael Univ. of Hawaii-Manoa</td>
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<td>Design and Modeling of a Novel Haptic Device</td>
<td>Tang, Zhouming Simon Fraser Univ.</td>
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<td>Payandeh, Shahram Simon Fraser Univ.</td>
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<td>Variable Resistance Hand Device Using an Electro-Rheological Fluid Damper</td>
<td>Weinberg, Brian Northeastern Univ.</td>
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<td>Khanicheh, Azadeh Northeastern Univ.</td>
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<td>Sivak, Mark northeastern Univ.</td>
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<td>Uluhisarcioklu, Ozer Northeastern Univ.</td>
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<td>Morel, Guillaume Univ. Pierre et Marie Curie - Paris 6</td>
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<td>Bonmassar, Giorgio Massachusetts General Hospital</td>
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<td>Mavroidis, Constantinos Northeastern Univ.</td>
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<td>Design of a New Fmri Compatible Haptic Interface</td>
<td>Li, Sijiao Scuola Superiore S. Anna</td>
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<td>Raabe, Markus Univ. of Regensburg</td>
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<td>Greenlee, Mark W. Univ. of Regensburg</td>
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<td>14:00-15:30</td>
<td>FrC5</td>
<td>Dynamics and Control 2 (Poster)</td>
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<td>Passive Set-Position Modulation Approach for Haptics with Slow, Variable, and Asynchronous Update</td>
<td>Lee, Dongjun Univ. of Tennessee-Knoxville</td>
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<td>Huang, Ke Univ. of Tennessee-Knoxville</td>
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<td>Improving Transparency in Network-Based Haptics</td>
<td>Niaokosari, Sina McMaster Univ.</td>
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<td>Sirouspour, Shahin McMaster Univ.</td>
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<td>Remote Dynamic Proxies for Wave-Based Peer-To-Peer Haptic Interaction</td>
<td>Li, Zhi Univ. of Victoria</td>
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<td>Constantinescu, Daniela Univ. of Victoria</td>
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<td>Performance of Equivalent Frequency-Dependent Damping</td>
<td>Lim, Yo-An Gwangju Inst. of Science and Tech.</td>
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<td>Ahn, Hyo-Sung Gwangju Inst. of Science and Tech.</td>
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<td>Ryu, Jeha Gwangju Inst. of Science and Tech.</td>
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<td>14:00-15:30</td>
<td>FrC6</td>
<td>Perception 4 (Poster)</td>
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<td>Finger Force of Exploratory Movements Is Adapted to the Compliance of Deformable Objects</td>
<td>Kaim, Lukas Univ. of Giessen</td>
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<td>Drewing, Knut Univ. of Giessen</td>
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<td>Fuernstahl, Philipp ETH Zurich</td>
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</table>
Ramesh, K. T. The Johns Hopkins Univ.
Okamura, Allison M. The Johns Hopkins Univ.
Harders, Matthias ETH Zurich

14:00-15:30 FrC6.3
A Model of Perception of the Center of Elastic Force Fields
Bocca, Francesca San Raffaele Vita-Salute Univ.
Baud-bovy, Gabriel San Raffaele Vita-Salute Univ.

14:00-15:30 FrC6.4
The Equivalence of Vision and Haptics When Matched Spatiotemporally
Symmons, Mark Monash Univ.
Richardson, Barry Monash Univ.

FrCT1 Demos 2 (Demo)

14:00-15:30 FrCT1.1
A Fingertip Shear Tactile Display for Communicating Direction Cues
Horschel, Scott Univ. of Utah
Gleeson, Brian Univ. of Utah
Provancher, William Univ. of Utah

14:00-15:30 FrCT1.2
Displaying Realistic Contact Accelerations Via a Dedicated Vibration Actuator
McMahan, William Univ. of Pennsylvania
Kuchenbecker, Katherine J. Univ. of Pennsylvania

14:00-15:30 FrCT1.3
Feasibility Study of a Rotational Haptic Display -- Rotational Action and Measuring the Rotational Moment at the Wrist
Sone, Junji Tokyo Pol. Univ.

14:00-15:30 FrCT1.4
Energy-Bounding Algorithm for Stable Haptic Interaction and Bilateral Teleoperation
Seo, Changhoon Gwangju Inst. of Science and Tech. (GIST)
Kim, Jong-Phil Korea Inst. of Science and Tech. (KIST)
Kim, Jaeha Gwangju Inst. of Science and Tech. (GIST)
Ryu, Jeha Gwangju Inst. of Science and Tech. (GIST)

14:00-15:30 FrCT1.5
A Low Cost Vibrotactile Array to Manage Respiratory Motion
Israr, Ali Rice Univ.
Eng, Dillon Rice Univ.
Vedam, Sastry The Univ. of Texas M. D. Anderson Cancer Center
O'Malley, Marcia Rice Univ.

14:00-15:30 FrCT1.6
Vibrotactile Feedback System for Intuitive Upper-Limb Rehabilitation
Kapur, Pulkit Univ. of Pennsylvania
Premakumar, Sunthar Univ. of Pennsylvania
Jax, Steven Moss Rehabilitation Res. Inst.
Buxbaum, Laurel Moss Rehabilitation Res. Inst.
Dawson, Amanda Moss Rehabilitation Res. Inst.
Kuchenbecker, Katherine J. Univ. of Pennsylvania

14:00-15:30 FrCT1.7
Compact and Low-Cost Tendon Vibrator for Inducing Proprioceptive Illusions
Celik, Ozkan Rice Univ.
O'Malley, Marcia Rice Univ.
Gillespie, Brent Univ. of Michigan
Shewokis, Patricia A. Drexel Univ.
Contreras-Vidal, Jose Luis Univ. of Maryland

14:00-15:30 FrCT1.8
Haptic Interface for Perceiving Remote Object Using a Laser Range Finder
Yano, Hiroaki Univ. of Tsukuba
Miyamoto, Yuichi Univ. of Tsukuba
Iwata, Hiroo Univ. of Tsukuba

14:00-15:30 FrCT1.9
Stretchable Fingernail Sensors for Measurement of Fingertip Force
Abu-Khalaf, Jumana Univ. of Utah
Park, Jung Woo Univ. of Utah
Mascaro, Debra Univ. of Utah
Mascaro, Stephen Univ. of Utah

14:00-15:30 FrCT1.10
Functionally Biarticular Control for Smart Prosthetics
Gillespie, Brent Univ. of Michigan
15:30-16:00 Coffee break

FrD1 Perception 5 (Oral)

16:00-16:15 FrD1.1 Evaluation of Weight Perception During Unimanual and Bimanual Manipulation of Virtual Objects
   Giachritsis, Christos
   Barrio Gragera, Jordi
   Ferre, Manuel
   Wing, Alan
   Ortego, Javier
   Univ. of Birmingham
   Univ. Pol. de Madrid
   Univ. Pol. de Madrid
   Univ. of Birmingham
   FrD1.2 Discrimination of Thermal Diffusivity
   Bergmann Tiest, Wouter
   Kappers, Astrid M.L.
   Utrecht Univ.
   Utrecht Univ.
   FrD1.3 Haptic, Visual and Visuo-Haptic Softness Judgments for Objects with Deformable Surfaces
   Drewing, Knut
   Ramisch, Andreas
   Bayer, Florian
   Justus-Liebig-Univ. Giessen
   Justus-Liebig-Univ. Giessen
   Justus-Liebig-Univ. Giessen
   FrD1.4 Haptic Stiffness Identification by Veterinarians and Novices: A Comparison
   Forrest, Neil
   Baillie, Sarah
   Tan, Hong
   Univ. of London
   Univ. of London
   Purdue Univ.

17:00-17:30 Closing, announcements (next HS, EH, WHC)