

2020 IEEE Haptics Symposium (HAPTICS 2020)

**Crystal City, Virginia, USA
28 – 31 March 2020**



**IEEE Catalog Number: CFP20317-POD
ISBN: 978-1-7281-0235-1**

**Copyright © 2020 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP20317-POD
ISBN (Print-On-Demand):	978-1-7281-0235-1
ISBN (Online):	978-1-7281-0234-4
ISSN:	2324-7347

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

Content List of 2020 IEEE Haptics Symposium (HAPTICS)

Technical Program for Sunday March 29, 2020

SuA1	Grand Ballroom, Salons ABJK
Oral Session 1: Softness and Soft Haptics (Oral Session)	
09:00-09:15	SuA1.1
<i>Soft Haptic Interface Based on Vibration and Particle Jamming</i> , pp. 1-6.	
Brown, Joshua P. Farkhatdinov, Ildar	Queen Mary University of London Queen Mary University of London
09:15-09:30	SuA1.2
<i>Elastowave: Localized Tactile Feedback in a Soft Haptic Interface Via Focused Elastic Waves</i> , pp. 7-14.	
Reardon, Gregory	University of California, Santa Barbara
Kastor, Nikolas	University of California Santa Barbara
Shao, Yitian	University of California, Santa Barbara
Visell, Yon	UC Santa Barbara
09:30-09:45	SuA1.3
<i>Fluidic Haptic Interface for Mechano-Tactile Feedback</i> , N/A.	
Shi, Ge	University College London
Palombi, Andrea	University College London
Lim, Zara Timothea Yue Xin	King's College London
Astolfi, Anna	University of Pisa
Burani, Andrea	University of Pisa
Campagnini, Silvia	University of Pisa
Cornacchia Loizzo, Federica	University of Pisa
Lo Preti, Matteo	Istituto Italiano Di Tecnologia
Marin Vargas, Alessandro	University of Pisa
Peperoni, Emanuele	University of Pisa
Oddo, Calogero Maria	Scuola Superiore Sant'Anna
Li, Min	Xi'an Jiaotong University
Hardwicke, Joseph	University Hospitals Coventry and Warwickshire NHS Trust
Venus, Matthew	University Hospitals Coventry and Warwickshire NHS Trust
Homer-Vanniasinkam, Shervanthi	University College London
Wurdemann, Helge Arne	University College London
09:45-10:00	SuA1.4
<i>Time-Dependent Cues Encode the Minimum Exploration Time in Discriminating Naturalistic Compliances</i> , pp. 22-27.	
Xu, Chang Gerling, Gregory J.	University of Virginia University of Virginia
10:00-10:10	SuA1.5
<i>Effect of Material Hardness on Friction between a Bare Finger and Dry and Lubricated Artificial Skin</i> , N/A.	
Inoue, Koki Okamoto, Shogo Akiyama, Yasuhiro Yamada, Yoji	Nagoya University Nagoya University Nagoya-University Nagoya University
10:10-10:20	SuA1.6
<i>Identifying 3-D Spatiotemporal Skin Deformation Cues Evoked in Interacting with Compliant Elastic Surfaces</i> , pp. 35-40.	
SuB2	Grand Ballroom, Salons JK
Oral Session 2A: Haptic Rendering (Oral Session)	
11:00-11:15	Sub2.1
<i>Closed Loop Application of Electroadhesion for Increased Precision in Texture Rendering</i> , N/A.	
Grigorii, Roman Colgate, Edward	Northwestern University
11:15-11:25	Sub2.2
<i>Step-Change in Friction under Electrovibration</i> , N/A.	
Ozdamar, Idil Alipour, M. Reza Alipour Delhaye, Benoit	Koc University Koc University Institute of Neuroscience, Université Catholique de Louvain, Belg
Lefevre, Philippe Basdogan, Cagatay	Université Catholique De Louvain Koc University
11:25-11:35	Sub2.3
<i>HapToes: Vibrotactile Numeric Information Delivery Via Tactile Toe Display</i> , pp. 61-67.	
Vyas, Preeti Al Taha, Feras Blum, Jeffrey R. Cooperstock, Jeremy	McGill University McGill University McGill University McGill University
11:35-11:45	Sub2.4
<i>Subjective Evaluation of the Spectral Temporal SIMilarity (ST-SIM) Measure for Vibrotactile Quality Assessment</i> , N/A.	
Hassen, Rania Steinbach, Eckehard	PDF Technical University of Munich
11:45-12:00	Sub2.5
<i>Path Routing Optimization for STM Ultrasound Rendering</i> , N/A.	
Barreiro, Hector Sinclair, Stephen Otaduy, Miguel A.	URJC Madrid Universidad Rey Juan Carlos URJC Madrid
12:00-12:10	Sub2.6
<i>SPH Fluid Tactile Rendering for Ultrasonic Mid-Air Haptics</i> , N/A.	
Jang, Jaehyun Park, Jinah	KAIST KAIST
12:10-12:20	Sub2.7
<i>Reducing Amplitude Fluctuation by Gradual Phase Shift in Midair Ultrasound Haptics</i> , N/A.	
Suzuki, Shun Fujiwara, Masahiro Makino, Yasutoshi Shinoda, Hiroyuki	The University of Tokyo The University of Tokyo The University of Tokyo Univ. of Tokyo
12:20-12:30	Sub2.8
<i>Virtual Bumps Display Based on Electrical Muscle Stimulation</i> , pp. 96-101.	

Ishimaru, Takaya Saga, Satoshi	Kumamoto University Kumamoto University	Systems
SuB3 Oral Session 2B: Teleoperation (Oral Session)	Grand Ballroom, Salons AB	SuB3.8
11:00-11:15	SuB3.1	
<i>Caring about the Human Operator: Haptic Shared Control for Enhanced User Comfort in Robotic Telemansipulation, N/A.</i>		
Rahal, Rahaf Matarese, Giulia Gabiccini, Marco Artoni, Alessio Prattichizzo, Domenico Robuffo Giordano, Paolo Pacchierotti, Claudio	Univ Rennes, Inria, CNRS, IRISA Inria University of Pisa Università Di Pisa University of Siena Centre National De La Recherche Scientifique (CNRS) Centre National De La Recherche Scientifique (CNRS)	Boston University Boston University Boston University
11:15-11:25	SuB3.2	
<i>Integrating Haptic Data Reduction with Energy Reflection Based Passivity Control for Time-Delayed Teleoperation, pp. 109-114.</i>		
Xu, Xiao Panzirsch, Michael Liu, Qian Steinbach, Eckehard	Technical University Munich DLR Institute of Robotics and Mechatronics Dalian University of Technology Technical University of Munich	Tohoku University University of Tokyo Tohoku University Tohoku University
11:25-11:35	SuB3.3	
<i>Estimation of Upper-Limb Energy Absorption Capabilities for Stable Human-Robot Interactions, pp. 115-120.</i>		
Ramos, Andres Hashtrudi-Zaad, Keyvan	Queen's University Queen's University	University of Wisconsin - Madison University of Wisconsin Madison
11:35-11:45	SuB3.4	
<i>Haptic-Guided Teleoperation of a 7-DoF Collaborative Robot Arm with an Identical Twin Master, N/A.</i>		
Singh, Jayant Srinivasan, Aravinda Ramakrishnan Neumann, Gerhard Kucukyilmaz, Ayse	University of Lincoln University of Lincoln, UK University of Lincoln University of Nottingham	Johns Hopkins University Johns Hopkins University Johns Hopkins University
11:45-11:55	SuB3.5	
<i>Prefatory Study of the Effects of Exploration Dynamics on Stiffness Perception, pp. 128-133.</i>		
Singhal, Mohit Brown, Jeremy DeLaine	Johns Hopkins University Johns Hopkins University	Max Planck Institute for Intelligent Systems
11:55-12:05	SuB3.6	
<i>Adaptive Packet Rate Control for the Mitigation of Bursty Haptic Traffic in Teleoperation Systems, pp. 134-139.</i>		
Gui, Ming Xu, Xiao Steinbach, Eckehard	Technical University of Munich Technical University Munich Technical University of Munich	CNRS
12:05-12:20	SuB3.7	
<i>Haptic Object Parameter Estimation During Within-Hand Manipulation with a Simple Robot Gripper, pp. 140-147.</i>		
Mohtasham, Delara Sathyarayanan, Gokul narayanan Calli, Berk Spiers, Adam	Stanford University Worcester Polytechnic Institute Worcester Polytechnic Institute Max Planck Institute for Intelligent	University of Southern California University of Southern California University of Southern California
12:20-12:30		SuDS.1
<i>Haptic Teleoperation of UAVs through Control Barrier Functions, N/A.</i>		
Zhang, Dawei Yang, Guang Khurshid, Rebecca	Boston University Boston University Boston University	
SuDS Demonstrations Session 1 and Exhibits (Demonstration Session)	Grand Ballroom, Salons C-H	
14:30-16:30		SuDS.2
<i>A Compact Driving Simulator Enhanced with a Two-DoF Buttock Skin Stretch Device, N/A.</i>		
Yanai, Tomohiro Horie, Arata Konyo, Masashi Tadokoro, Satoshi	Tohoku University University of Tokyo Tohoku University Tohoku University	
14:30-16:30		SuDS.3
<i>A Comparison of Active and Hybrid Active-Passive Actuation in Handheld Kinesthetic Haptics, N/A.</i>		
Dills, Patrick Zhang, Bolun Colonnese, Nick, Nicholas Agarwal, Priyanshu Zinn, Michael	University of Wisconsin - Madison University of Wisconsin Madison Facebook Reality Labs Facebook Inc University of Wisconsin - Madison	
14:30-16:30		SuDS.4
<i>A Demonstration of an Anthropomorphically-Driven Prosthesis Featuring Embedded Haptic Feedback, N/A.</i>		
Miller, Ethan Amanze, Ihemriorochi Brown, Jeremy DeLaine	Johns Hopkins University Johns Hopkins University Johns Hopkins University	
14:30-16:30		SuDS.5
<i>A Hands-On Stand-Alone Teaching Module on Force-Feedback Haptic Devices, N/A.</i>		
Gueorguiev, David Seifi, Hasti	Max Planck Institute for Intelligent Systems	
14:30-16:30		SuDS.6
<i>A Real-Time Sound Modeling and Rendering System for Virtual Tool-Surface Interactions, N/A.</i>		
Lu, Shihan Chen, Yang Culbertson, Heather	University of Southern California University of Southern California University of Southern California	
14:30-16:30		SuDS.7
<i>A Wearable Haptic Interface for Protactile-Inspired Communication, N/A.</i>		
MacGavin, Bryan Gorlewicz, Jenna	Saint Louis University Saint Louis University	
14:30-16:30		SuDS.8
<i>BeaTactile: A Tactile Display for Low-Frequency Spatial Surfaces Using Wave Interferences, N/A.</i>		
Kawazoe, Anzu Hachisu, Taku Visell, Yon	University of California, Santa Barbara University of Tsukuba UC Santa Barbara	

<i>Braille Display for Portable Device Using Flip-Latch Structured Electromagnetic Actuator, N/A.</i>		<i>Demonstration of Haptic Teleoperation of UAVs through Control Barrier Functions, N/A.</i>
Kim, Joonyeong Han, Byung-Kil Pyo, Dongbum Ryu, Semin Kim, Hanbyeol Kwon, Dong-Soo	KAIST KAIST KAIST KAIST KAIST KAIST	Zhang, Dawei Yang, Guang Khurshid, Rebecca
14:30-16:30	SuDS.9	Boston University Boston University Boston University
<i>Combined Tracking and Vibrotactile Rendering with a Wearable Armband, N/A.</i>		<hr/>
Aggravi, Marco Lisini Baldi, Tommaso Pacchierotti, Claudio Prattichizzo, Domenico	CNRS University of Siena Centre National De La Recherche Scientifique (CNRS) University of Siena	Lalamentik, Anastasia Heo, Seongkook
14:30-16:30	SuDS.10	University of Virginia University of Virginia
<i>Composing Peristaltic Motion: Wearable Haptic Feedback from Fluidic Fabric Muscle Actuators, N/A.</i>		<hr/>
Zhu, Mengjia Ferster, Adrian Dinulescu, Stejara Kastor, Nikolas Visell, Yon	University of California, Santa Barbara ETH Zurich University of California, Santa Barbara University of California Santa Barbara UC Santa Barbara	Vardar, Yasemin Kuchenbecker, Katherine J.
14:30-16:30	SuDS.11	MPI for Intelligent Systems Max Planck Institute for Intelligent Systems
<i>Contextual Haptic Interfaces for First Responders in Virtual Reality, N/A.</i>		<hr/>
Bakshi, Ashish Bakshi, Shaunak de Castro, Cesar Dias, Andreas Buchanan, Thomas Douglass, Craig Schroeder, Zachary	ASA-VR ASA-VR ASA-VR ASA-VR Contact Control Interfaces Contact Control Interfaces Contact Control Interfaces	Clepper, Gina Martinez, Juan Sebastian Farooq, Ahmed Allred, Alyse Marie McDonald, Kevin Carr, Ian Toombs, Austin Tan, Hong
14:30-16:30	SuDS.12	Purdue University Purdue University University of Tampere Purdue University Purdue University Purdue University Purdue University Purdue University
<i>Continuous 6-DOF Haptic Rendering of Dental Drilling, N/A.</i>		<hr/>
Kalusche, Maximilian Weller, René Zachmann, Gabriel	University of Bremen, Institute for Computer Graphics and Virtua University of Bremen University of Bremen	D'Aurizio, Nicole Lisini Baldi, Tommaso Prattichizzo, Domenico
14:30-16:30	SuDS.13	University of Siena, Istituto Italiano Di Tecnologia University of Siena University of Siena
<i>Demonstrating Electrotactile Feedback on the Hand, N/A.</i>		<hr/>
Alotaibi, Yosuef Williamson, John H. Brewster, Stephen	University of Glasgow University of Glasgow University of Glasgow	Sanchez, Ramon Khurshid, Rebecca
14:30-16:30	SuDS.14	Boston University Boston University
<i>Demonstrating Spatiotemporal Haptic Effects from a Single Actuator Via Spectral Control of Cutaneous Wave Propagation, N/A.</i>		<hr/>
Dandu, Bharat Shao, Yitian Stanley, Andrew A. Visell, Yon	UCSB University of California, Santa Barbara Stanford University UC Santa Barbara	Ding, Haiyang Mitake, Hironori Hasegawa, Shoichi
14:30-16:30	SuDS.15	Tokyo Institute of Technology Tokyo Institute of Technology Tokyo Institute of Technology
<i>14:30-16:30</i>	<i>SuDS.16</i>	
<i>Demonstration of Tactile Glance: Encoding Notifications Using Illusive Movement Constraints for Eyes and Ears-Free Interaction, N/A.</i>		<hr/>
Lalamentik, Anastasia Heo, Seongkook	University of Virginia University of Virginia	
14:30-16:30	SuDS.17	
<i>Do Touch Gestures Affect How Electrovibration Feels?, N/A.</i>		<hr/>
Vardar, Yasemin Kuchenbecker, Katherine J.	MPI for Intelligent Systems Max Planck Institute for Intelligent Systems	
14:30-16:30	SuDS.18	
<i>Feeling Creepy: A Haptic Haunted House (Demo), N/A.</i>		<hr/>
Clepper, Gina Martinez, Juan Sebastian Farooq, Ahmed Allred, Alyse Marie McDonald, Kevin Carr, Ian Toombs, Austin Tan, Hong	Purdue University Purdue University University of Tampere Purdue University Purdue University Purdue University Purdue University Purdue University	
14:30-16:30	SuDS.19	
<i>Hand Guidance Using Grasping Metaphor, Wearable Haptics, and LeapMotion, N/A.</i>		<hr/>
D'Aurizio, Nicole Lisini Baldi, Tommaso Prattichizzo, Domenico	University of Siena, Istituto Italiano Di Tecnologia University of Siena University of Siena	
14:30-16:30	SuDS.20	
<i>Haptic Feedback System for a Smart Walker, N/A.</i>		<hr/>
Sanchez, Ramon Khurshid, Rebecca	Boston University Boston University	
14:30-16:30	SuDS.21	
<i>Haptic Interaction with Dynamic and Deformable Objects Using a "Mass-Less" Proxy, N/A.</i>		<hr/>
Ding, Haiyang Mitake, Hironori Hasegawa, Shoichi	Tokyo Institute of Technology Tokyo Institute of Technology Tokyo Institute of Technology	
14:30-16:30	SuDS.22	
<i>Haptic Vest for Displaying Full Body Collisions in VR Games, N/A.</i>		<hr/>
Cumbul, Kivilcim Uludag, Fatma Zehra Culbertson, Heather	University of Southern California Los Angeles University of Southern California	
14:30-16:30	SuDS.23	
<i>Interacting with Fluids Using Ultrasonic Mid-Air Haptic Device, N/A.</i>		<hr/>
Jang, Jaehyun Park, Jinah	KAIST KAIST	
14:30-16:30	SuDS.24	
<i>PUMAH : Pan-Tilt Ultrasound Mid-Air Haptics, N/A.</i>		

Howard, Thomas	CNRS	Technology
Gicquel, Guillaume	CNRS	Purdue University
Marchal, Maud	INSA/INRIA	Purdue University
Lecuyer, Anatole	INRIA	Purdue University
Pacchierotti, Claudio	Centre National De La Recherche Scientifique (CNRS)	Purdue University
14:30-16:30	SuDS.25	
<i>Syntacts: Open Source Framework for Audio-Controlled Vibrotactile Haptics, N/A.</i>		
Pezent, Evan	Rice University	Facebook Inc
Cambio, Brandon	Rice University	Facebook Inc
O'Malley, Marcia	Rice University	Facebook Inc
14:30-16:30	SuDS.26	
<i>Tactical Combat Care (TC3) Haptics-Based Virtual Reality Training System Demonstration, N/A.</i>		
Cummings, Paul	ECS	
14:30-16:30	SuDS.27	
<i>Tactile Transmission with Pressure Distribution Sensor and Electrical and Mechanical Stimulation, N/A.</i>		
Yem, Vibol	Tokyo Metropolitan University	POSTECH
Ikei, Yasushi	Tokyo Metropolitan University	Alibaba Group
Kajimoto, Hiroyuki	The University of Electro-Communications	POSTECH
14:30-16:30	SuDS.28	
<i>Tactile Guided Button Click Rendering Based on Active Lateral Force Feedback, N/A.</i>		
Xu, Heng	Northwestern University	Stanford University
Peshkin, Michael	Northwestern University	Scuola Superiore Sant'Anna, TeCIP Institute
Colgate, Edward	Northwestern University	Scuola Superiore Sant'Anna
14:30-16:30	SuDS.29	
<i>Virtual Grasp-And-Hold Task Using Continuous Vibrotactile and Squeezing Cues, N/A.</i>		
Machaca, Sergio	Johns Hopkins University	POSTECH
Ung, Garrett	Johns Hopkins University	POSTECH
Brown, Jeremy DeLaine	Johns Hopkins University	POSTECH
SuHS	Grand Ballroom, Salons ABJ/K	
IEEE Transactions on Haptics Poster Session (Poster Session)		
16:30-18:00	SuHS.1	
<i>A Haptic Shared-Control Architecture for Guided Multi-Target Robotic Grasping, N/A.</i>		
Abi-Farraj, Firas	CNRS-Irisa	
Pacchierotti, Claudio	Centre National De La Recherche Scientifique (CNRS)	
Arenz, Oleg	TU Darmstadt	
Neumann, Gerhard	University of Lincoln	
Robuffo Giordano, Paolo	Centre National De La Recherche Scientifique (CNRS)	
16:30-18:00	SuHS.2	
<i>A Phonemic-Based Tactile Display for Speech Communication, N/A.</i>		
Reed, Charlotte	Massachusetts Institute of Technology	McGill University
Tan, Hong	Purdue University	McGill University
Perez, Zachary D.	Massachusetts Institute of Technology	McGill University
Wilson, E. Courtenay	Massachusetts Institute of Technology	McGill University, Dept of Elec. &
16:30-18:00	SuHS.3	
<i>Continuous Collision Detection for Virtual Proxy Haptic Rendering of Deformable Triangular Mesh Models, N/A.</i>		
Ding, Haiyang	Tokyo Institute of Technology	
Mitake, Hironori	Tokyo Institute of Technology	
Hasegawa, Shoichi	Tokyo Institute of Technology	
16:30-18:00	SuHS.4	
<i>Data-Driven Texture Modeling and Rendering on Electrovibration Display, N/A.</i>		
Osgouei, Reza	POSTECH	
Kim, Jin Ryong	Alibaba Group	
Choi, Seungmoon	POSTECH	
16:30-18:00	SuHS.5	
<i>Design Requirements of Generic Hand Exoskeletons and Survey of Hand Exoskeletons for Rehabilitation, Assistive, or Haptic Use, N/A.</i>		
Sarac, Mine	Stanford University	
Solazzi, Massimiliano	Scuola Superiore Sant'Anna, TeCIP Institute	
Frisoli, Antonio	Scuola Superiore Sant'Anna	
16:30-18:00	SuHS.6	
<i>Effects of Contact Force and Vibration Frequency on Vibrotactile Sensitivity During Active Touch, N/A.</i>		
Oh, Seungjae	POSTECH	
Choi, Seungmoon	POSTECH	
16:30-18:00	SuHS.7	
<i>Evolution and Analysis of Hapkit: An Open-Source Haptic Device for Educational Applications, N/A.</i>		
Orta Martinez, Melisa	Stanford University	
Nunez, Cara M.	Stanford University	
Liao, Ting	Stanford University	
Morimoto, Tania	University of California San Diego	
Okamura, Allison M.	Stanford University	
16:30-18:00	SuHS.8	
<i>Experimental Assessment of Absolute Stability in Bilateral Teleoperation, N/A.</i>		
Mokogwu, Chiedu Nnaji	Queen's University	
Razi, Kamran	Queen's University	
Hashtrudi-Zaad, Keyvan	Queen's University	
16:30-18:00	SuHS.9	
<i>Getting Your Hands Dirty Outside the Lab: A Practical Primer for Conducting Wearable Vibrotactile Haptics Research, N/A.</i>		
Blum, Jeffrey R.	McGill University	
Fortin, Pascal	McGill University	
Al Taha, Feras	McGill University	
Alirezaee, Parisa	McGill University	
Demers, Marc	McGill University, Dept of Elec. &	

Weill-Duflos, Antoine Cooperstock, Jeremy	Cptr Engr McGill University McGill University	Israr, Ali Lau, Frances Klumb, Keith Abnousi, Freddy O'Malley, Marcia	Facebook Inc Facebook Inc Facebook Inc Facebook Inc Rice University		
16:30-18:00	SuHS.10	16:30-18:00	SuHS.17		
<i>Haptic Exploration During Fast Video Playback: Vibrotactile Support for Event Search in Robot Operation Videos, N/A.</i>	Gongora Flores, Daniel Marcell Konyo, Masashi Nagano, Hikaru Tadokoro, Satoshi	Tohoku University Tohoku University Kobe University Tohoku University	<i>Presenting Surface Features Using a Haptic Ring: A Psychophysical Study on Relocating Vibrotactile Feedback, N/A.</i>	Gaudeni, Chiara Meli, Leonardo Jones, Lynette Prattichizzo, Domenico	University of Siena University of Siena MIT University of Siena
16:30-18:00	SuHS.11	16:30-18:00	SuHS.18		
<i>How Do Novice Hapticians Design? a Case Study in Creating Haptic Learning Environments, N/A.</i>	Seifi, Hasti Chun, Matthew Gallacher, Colin Schneider, Oliver MacLean, Karon	Max Planck Institute for Intelligent Systems University of British Columbia McGill University University of British Columbia University of British Columbia	<i>Representing Interpersonal Touch Directions by Tactile Apparent Motion Using Smart Bracelets, N/A.</i>	Hachisu, Taku Suzuki, Kenji	University of Tsukuba University of Tsukuba
16:30-18:00	SuHS.12	16:30-18:00	SuHS.19		
<i>Human-Robot Team Interaction through Wearable Haptics for Cooperative Manipulation, N/A.</i>	Musić, Selma Salvietti, Gionata Budde genannt Dohmann, Pablo Chinello, Francesco Prattichizzo, Domenico Hirche, Sandra	Technische Universität München University of Siena Technical University Munich Aarhus University University of Siena Technische Universität München	<i>Skin Stretch Haptic Feedback to Convey Closure Information in Anthropomorphic, Under-Actuated Upper Limb Soft Prostheses, N/A.</i>	Battaglia, Edoardo Clark, Janelle Bianchi, Matteo Catalano, Manuel Giuseppe Bicchi, Antonio O'Malley, Marcia	University of Pisa - Research Center E. Piaggio Rice University University of Pisa Istituto Italiano Di Tecnologia Università Di Pisa Rice University
16:30-18:00	SuHS.13	16:30-18:00	SuHS.20		
<i>Implementation of a 6-DOF Parallel Continuum Manipulator for Delivering Fingertip Tactile Cues, N/A.</i>	Young, Eric Kuchenbecker, Katherine J.	University of Pennsylvania Max Planck Institute for Intelligent Systems	<i>Spatially Separating Haptic Guidance from Task Dynamics through Wearable Devices, N/A.</i>	Pezent, Evan Fani, Simone Clark, Janelle Bianchi, Matteo O'Malley, Marcia	Rice University University of Pisa Rice University University of Pisa Rice University
16:30-18:00	SuHS.14	16:30-18:00	SuHS.21		
<i>Influence of Sparse Contact Point and Finger Penetration into Object on Shape Recognition, N/A.</i>	Ujitoko, Yusuke Sakurai, Sho Hirotा, Koichi	University of Electro-Communications, Hitachi, Ltd., The University of Electro-Communications The University of Electro-Communications	<i>Tactile Roughness Perception of Virtual Gratings by Electrovibration, N/A.</i>	Isleyen, Aykut Vardar, Yasemin Basdogan, Cagatay	Koc University MPI for Intelligent Systems Koc University
16:30-18:00	SuHS.15	16:30-18:00	SuHS.22		
<i>Midair Haptic Pursuit, N/A.</i>	Yoshimoto, Azuma Hasegawa, Keisuke Makino, Yasutoshi Shinoda, Hiroyuki	Mitsubishi Electric Corporation The University of the Tokyo The University of Tokyo Univ. of Tokyo	<i>Tactile Stimulation by Repetitive Lateral Movement of Midair Ultrasound Focus, N/A.</i>	Takahashi, Ryoko Hasegawa, Keisuke Shinoda, Hiroyuki	The University of Tokyo The University of the Tokyo Univ. of Tokyo
16:30-18:00	SuHS.16	16:30-18:00	SuHS.23		
<i>Multi-Sensory Stimuli Improve Distinguishability of Cutaneous Haptic Cues, N/A.</i>	Sullivan, Jennifer Dunkelberger, Nathan Bradley, Joshua Young, Joseph	Rice University Rice University Rice University Rice University	<i>The Evaluation of Tactile Parameters and Display Prototype to Support Physiological Monitoring and Multitasking for Anesthesia Providers in the Operating Room, N/A.</i>	Gomes, Kylie Scott Reeves, Scott Reeves Sara Riggs, Sara Lu	University of Virginia Medical University of South Carolina University of Virginia
16:30-18:00	SuHS.24	16:30-18:00			

Xu, Heng	Northwestern University
Peshkin, Michael	Northwestern University
Colgate, Edward	Northwestern University

16:30-18:00	SuHS.25
<i>Understanding Continuous and Pleasant Linear Sensations on the Forearm from a Sequential Discrete Lateral Skin-Slip Haptic Device, N/A.</i>	
Nunez, Cara M.	Stanford University
Williams, Sophia R.	Stanford University
Okamura, Allison M.	Stanford University
Culbertson, Heather	University of Southern California

16:30-18:00	SuHS.26
<i>Unilateral and Bilateral Virtual Springs: Contact Transitions Unmask Device Dynamics, N/A.</i>	
Treadway, Emma	Trinity University
Gillespie, Brent	University of Michigan

16:30-18:00	SuHS.27
<i>Using a Variable-Friction Robot Hand to Determine Proprioceptive Features for Object Classification During Within-Hand-Manipulation, N/A.</i>	
Spiers, Adam	Max Planck Institute for Intelligent Systems
Morgan, Andrew	Yale University
Srinivasan, Krishnan	Stanford University
Calli, Berk	Worcester Polytechnic Institute
Dollar, Aaron	Yale University

16:30-18:00	SuHS.28
<i>Wearable Tactile Display Based on Thermal Expansion of Nichrome Wire, N/A.</i>	
Kajimoto, Hiroyuki	The University of Electro-Communications
Jones, Lynette	MIT

SuWPS	Grand Ballroom, Salons ABJK
Work in Progress Poster Session (Poster Session)	

20:00-21:30	SuWPS.1
<i>A Fabric-Based Sensing System for Recognizing Social Touch, N/A.</i>	
Bevill Burns, Rachael	Max Planck Institute for Intelligent Systems
Lee, Hyosang	Max Planck Institute for Intelligent Systems
Seifi, Hasti	Max Planck Institute for Intelligent Systems
Kuchenbecker, Katherine J.	Max Planck Institute for Intelligent Systems

20:00-21:30	SuWPS.2
<i>A Grip Force Measurement Concept for Tactile Stimulation Mechanisms, N/A.</i>	
Bitton, Guy	Ben Gurion University
Zarrouk, David	Ben Gurion University
Nisky, Ilana	Ben Gurion University of the Negev

20:00-21:30	SuWPS.3
<i>A Multivariate Modeling Approach to Deciphering Peripheral Nerve Signaling Underlying Naturalistic Human Touch, N/A.</i>	

Xu, Shan	University of Virginia
Hauser, Steven	University of Virginia
Nagi, Saad S.	Linkoping University
McIntyre, Sarah	Linkoping University
Olausson, Hakan	University of Gothenburg
Gerling, Gregory J.	University of Virginia

20:00-21:30	SuWPS.4
<i>A Novel Teleoperator Testbed to Understand the Effects of Master-Slave Dynamics on Embodiment and Kinesthetic Perception, N/A.</i>	

Singhala, Mohit	Johns Hopkins University
Brown, Jeremy DeLaine	Johns Hopkins University

20:00-21:30	SuWPS.5
<i>Accuracy in Judging Self-Generated Elbow Torques During Multi-Joint Isometric Tasks: Preliminary Findings, N/A.</i>	

Cai, Ninghe	Northwestern University
Guzman, Camille	Northwestern University
Gurari, Netta	Northwestern University

20:00-21:30	SuWPS.6
<i>An Experiment of Paradoxical Thermal Illusion on Fingers, N/A.</i>	

Hashiguchi, Satoshi	Ryukoku University
---------------------	--------------------

20:00-21:30	SuWPS.7
<i>Communicating Socio-Emotional Sentiment through Haptic Messages, N/A.</i>	

Cang, Laura	UBC
Israr, Ali	Facebook Inc

20:00-21:30	SuWPS.8
<i>Comparing the Perception of Vibrotactile Feedback on the Anterior and Posterior Sides of Wrists, Elbows, Ankles, and Knees, N/A.</i>	

Quick, Ryan Racel	Oregon State University
Fitter, Naomi T.	University of Southern California

20:00-21:30	SuWPS.9
<i>Design of a Wearable Hand-Grounded Kinesthetic Haptic Device for Multi-Directional Force Display, N/A.</i>	
Hosotani, Kiona	Kyoto University
Nisar, Sajid	Kyoto University
Endo, Takahiro	Kyoto University
Matsuno, Fumitoshi	Kyoto University

20:00-21:30	SuWPS.10
<i>Development of a 2-Axis Tactile Sensor Using Acoustic Reflection Principle for Tumor Detection in Laparoscopic Surgery, N/A.</i>	
Ly, Hoang Hiep	Nagoya Institute of Technology
Tanaka, Yoshihiro	Nagoya Institute of Technology

20:00-21:30	SuWPS.11
<i>Effects of Haptic Feedback on the Wrist during Virtual Manipulation, N/A.</i>	
Sarac, Mine	Stanford University
Okamura, Allison M.	Stanford University
Di Luca, Massimiliano	University of Birmingham

20:00-21:30	SuWPS.12
<i>Effects of Interfering Cue Amplitude on the Haptic Detection of Skin Stretch, N/A.</i>	
Low, Andrew K.	Rice University
Zook, Zane A.	Rice University
Fleck, Joshua J	Rice University

O'Malley, Marcia	Rice University	Boston University
20:00-21:30	SuWPS.13	Boston University
<i>Electronic Skin Based on Hybride System Employing a Resistive and a Piezoelectric Sensor for Fast Response of Thermal Contact, N/A.</i>		
Kang, Minsoo	DGIST	Trinity University
Sim, Minkyung	DGIST	University of Michigan
20:00-21:30	SuWPS.14	University of Michigan
<i>Encoding of Tangential Torque and Its Possible Role in Sensing Friction in the Context of Dexterous Manipulation, N/A.</i>		
Afzal, Hafiz Malik Naqash	Beihang University	The Chinese University of Hong Kong
Loutit, Alastair	UNSW Sydney	The Chinese University of Hong Kong
Wiertlewski, Michael	TU Delft	The Chinese University of Hong Kong
Vickery, Richard	UNSW Sydney	The Chinese University of Hong Kong
Redmond, Stephen	University of New South Wales	The Chinese University of Hong Kong
Khamis, Heba	University of NSW	The Chinese University of Hong Kong
Birznieks, Ingvars	Neuroscience Research Australia	The Chinese University of Hong Kong
20:00-21:30	SuWPS.15	The Chinese University of Hong Kong
<i>Feeling Creepy: A Haptic Haunted House, N/A.</i>		
Clepper, Gina	Purdue University	Texas A&M University
Martinez, Juan Sebastian	Purdue University	Texas A&M University
Farooq, Ahmed	University of Tampere	Texas A&M University
Allred, Alyse Marie	Purdue University	Texas A&M University
McDonald, Kevin	Purdue University	Texas A&M University
Carr, Ian	Purdue University	Texas A&M University
Toombs, Austin	Purdue University	Texas A&M University
Tan, Hong	Purdue University	Texas A&M University
20:00-21:30	SuWPS.16	Texas A&M University
<i>HapCaps: A Haptic Device for Finger Sense Training, N/A.</i>		
Orta Martinez, Melisa	Stanford University	POSTECH
Williams, Cathy Ann	Stanford University	POSTECH
Okamura, Allison M.	Stanford University	POSTECH
Boaler, Jo	Stanford University	POSTECH
20:00-21:30	SuWPS.17	POSTECH
<i>Haptic Rendering with Wearable Interfaces Using Machine Learning, N/A.</i>		
Chinello, Francesco	Aarhus University	POSTECH
Olsen, Martin	Aarhus University	POSTECH
Pacchierotti, Claudio	Centre National De La Recherche Scientifique (CNRS)	POSTECH
20:00-21:30	SuWPS.18	POSTECH
<i>Integrate Positioning Technology with Uniform Electrovibration Using Capacitive Coupling and High Resistance, N/A.</i>		
Sun, Zuowei	Jilin University	University of Virginia
Liu, Guohong	Jilin University	Linkoping University
Su, Yuning	Jilin University	Linkoping University
Sun, Xiaoying	Jilin University	University of Gothenburg
20:00-21:30	SuWPS.19	University of Virginia
<i>Intermediate Ridges Amplify Mechanoreceptor Strains in Static and Dynamic Touch, N/A.</i>		
Serhat, Gokhan	Max Planck Institute for Intelligent Systems, Haptic Intelligence	University of Virginia
Kuchenbecker, Katherine J.	Max Planck Institute for Intelligent Systems	University of Virginia
20:00-21:30	SuWPS.20	University of Electro-
<i>Investigating Vibrotactile Haptic Feedback on the Neck to Improve Robot-Mediated Object Manipulation, N/A.</i>		
Mitjans, Marc	Boston University	
Serafin, Aleksandra	Boston University	
Khurshid, Rebecca	Boston University	
20:00-21:30	SuWPS.21	
<i>Modeling of Soft Bellows Actuators, N/A..</i>		
Treadway, Emma	Trinity University	
Brei, Melissa	University of Michigan	
Gillespie, Brent	University of Michigan	
20:00-21:30	SuWPS.22	
<i>Motion Characteristics of Human Gentle Caress, N/A.</i>		
Chu, Sai Ting	Chinese University of Hong Kong	
Lo, Clive	The Chinese University of Hong Kong	
Schirmer, Annett	The Chinese University of Hong Kong	
20:00-21:30	SuWPS.23	
<i>MPAL: A Python Open Source Application for the Analysis of Hand Motion, N/A.</i>		
Lo, Clive	The Chinese University of Hong Kong	
Chu, Sai Ting	Chinese University of Hong Kong	
Schirmer, Annett	The Chinese University of Hong Kong	
20:00-21:30	SuWPS.24	
<i>Multi-Physics Model of the Finger-Device Interface for Electroadhesion Devices, N/A.</i>		
Li, Xinyi	Texas A&M University	
Choi, Changhyun	Texas A&M University	
Ma, Yuan	Texas A&M	
Hipwell, M Cynthia	Texas A&M University	
20:00-21:30	SuWPS.25	
<i>Perceived Magnitude Function of Friction Rendered by the Dahl Model, N/A.</i>		
Lim, Beomsu	Pohang University of Science and Technology	
Choi, Junkyeong	Pohang University of Science and Technology	
Yoo, Yongjae	Pohang University of Science and Technology	
Choi, Seungmoon	POSTECH	
20:00-21:30	SuWPS.26	
<i>Perceptual Tactile Aftereffects on the Waist: Effect of Stimulation Type and Location, N/A.</i>		
Thalji, Salma M.	Reutlingen University	
Rehmann, Markus	Reutlingen University	
Curio, Cristóbal	Reutlingen University	
20:00-21:30	SuWPS.27	
<i>Physical Attributes at the Skin Interface Driving the Sense of Pleasantness, N/A.</i>		
Rezaei, Merat	University of Virginia	
Nagi, Saad S.	Linkoping University	
McIntyre, Sarah	Linkoping University	
Olausson, Hakan	University of Gothenburg	
Gerling, Gregory J.	University of Virginia	
20:00-21:30	SuWPS.28	
<i>Presentation of a Hard Surface Via a Soft Moving Ball, N/A.</i>		
Takeuchi, Masahiro	University of Electro-	

Murata, Karen	Communications The University of Electro- Communications	Sim, Minkyung Kang, Minsoo Park, Jiho	DGIST DGIST DGIST
Kajimoto, Hiroyuki	The University of Electro- Communications		
20:00-21:30	SuWPS.29	20:00-21:30	SuWPS.37
<i>Proposing a Framework for Evaluating Haptic Feedback As a Modality for Velocity Guidance, N/A.</i>		<i>The Relationship between the Presentation Area and Its Sensation in Impulsive Force Display, N/A.</i>	
Ravichandar, Shweta	Johns Hopkins University	Ikeda, Naoto	Kumamoto University
Shah, Kinjal	Johns Hopkins University	Saga, Satoshi	Kumamoto University
Brown, Jeremy DeLaine	Johns Hopkins University		
20:00-21:30	SuWPS.30	20:00-21:30	SuWPS.38
<i>RepHap: Towards an Opensource Platform for Benchmarking Haptic Devices Leveraging the Robot Operating System Ecosystem, N/A.</i>		<i>The Tactile Mouse: Handheld Tactile Graphics for the Visually Impaired, N/A.</i>	
Frisson, Christian	McGill University	Brown, Joshua P.	Queen Mary University of London
Delbos, Benjamin	École De Technologie Supérieure	Witkowski, Mark	Imperial College
Desourdy, Felix	Haply		
Ding, Steve	Haply		
Wanderley, Marcelo	McGill University		
Levesque, Vincent	Ecole De Technologie Supérieure		
Gallacher, Colin	McGill University		
20:00-21:30	SuWPS.31	20:00-21:30	SuWPS.39
<i>Spatial Comparative Method for Analysis of Skin Deformation across Scales, N/A.</i>		<i>Towards an Understanding of How Humans Perceive Stiffness During Bimanual Exploration, N/A.</i>	
Choi, Changhyun	Texas A&M University	Singhala, Mohit	Johns Hopkins University
Ma, Yuan	Texas A&M	Carducci, Jacob	Johns Hopkins University
Li, Xinyi	Texas A&M University	Brown, Jeremy DeLaine	Johns Hopkins University
Hipwell, M Cynthia	Texas A&M Univeristy		
20:00-21:30	SuWPS.32	20:00-21:30	SuWPS.40
<i>Subjective Equality of Stretch and Squeeze Cues Applied to the Forearm, N/A.</i>		<i>Towards Electrically Rendered Virtual Environments: Characterization of Electrical Stimulation Feedthrough in Electromyographic Sensors, N/A.</i>	
Zook, Zane A.	Rice University	Cope, Thomas	University of Michigan - Ann Arbor
O'Malley, Marcia	Rice University	Agarwal, Varun	University of Michigan - Ann Arbor
20:00-21:30	SuWPS.33	Cutlip, Steven	University of Michigan
<i>SurfaceReach: Assistive Guidance by Electrovibration on a Large Table, N/A.</i>		Gillespie, Brent	University of Michigan
Rajkowski, Laura	École De Technologie Supérieure		
Friaa, Balkiss	École De Technologie Supérieure		
Levesque, Vincent	Ecole De Technologie Supérieure		
20:00-21:30	SuWPS.34	20:00-21:30	SuWPS.41
<i>Tactile Fingerspelling Letter Identification Using Whole-Hand Mechanical Signals, N/A.</i>		<i>Uncoupled Stability Evaluation for Haptic Interaction with Hunt-Crossley Virtual Environments, N/A.</i>	
Dinulescu, Stejara	University of California, Santa Barbara	Pecly, Leonam	Queen's University
Reardon, Gregory	University of California, Santa Barbara	Hashtroodi-Zaad, Keyvan	Queen's University
Topp, Sven	University of Sydney		
Visell, Yon	UC Santa Barbara		
20:00-21:30	SuWPS.35	20:00-21:30	SuWPS.42
<i>Tactile Glance: Encoding Notifications Using Illusive Movement Constraints for Eyes and Ears-Free Interaction, N/A.</i>		<i>Vestibular Detection Thresholds and Psychometric Functions of Motion Effects in Cardinal Directions, N/A.</i>	
Lalamentik, Anastasia	University of Virginia	Lee, Jiwan	Pohang University of Science and Technology (POSTECH)
Heo, Seongkook	University of Virginia	Choi, Seungmoon	POSTECH
20:00-21:30	SuWPS.36	20:00-21:30	SuWPS.43
<i>Tactile Sensing System to Mimic Personal Tactile Tendency by Machine Learning with Human-Based Tactile Feeling, N/A.</i>		<i>Visuo-Tactile Handwriting Training System Using Wearable Sleeve, N/A.</i>	
Zhu, Mengjia	University of California, Santa Barbara	Nair, Dhanya	Chapman University
Ferster, Adrian		Duback, Sean	Weber State University
Dinulescu, Stejara		Geoffrion, Robert	Weber State University
Kastor, Nikolas		Jackson, Justin	Weber State University
Visell, Yon			
20:00-21:30	SuWPS.37	20:00-21:30	SuWPS.44
<i>Wearable Haptic Feedback from Fluidic Fabric Muscle Actuators: Composing Peristaltic Motion, N/A.</i>		<i>Wearable Haptic Feedback from Fluidic Fabric Muscle Actuators: Composing Peristaltic Motion, N/A.</i>	
		Zhu, Mengjia	University of California, Santa Barbara
		Ferster, Adrian	ETH Zurich
		Dinulescu, Stejara	University of California, Santa Barbara
		Kastor, Nikolas	University of California Santa Barbara
		Visell, Yon	UC Santa Barbara

Technical Program for Monday March 30, 2020

MoA1	Grand Ballroom, Salons ABJK
Oral Session 3: Affective Haptics (Oral Session)	
09:00-09:15	MoA1.1
<i>Investigating Social Haptic Illusions for Tactile Stroking (SHIFTS), pp. 629-636.</i>	
Nunez, Cara M.	Stanford University
Huerta, Bryce N.	Stanford University
Okamura, Allison M.	Stanford University
Culbertson, Heather	University of Southern California
09:15-09:25	MoA1.2
<i>Investigating Electrotactile Feedback on the Hand, pp. 637-642.</i>	
Alotaibi, Yosuef	University of Glasgow
Williamson, John H.	University of Glasgow
Brewster, Stephen	University of Glasgow
09:25-09:35	MoA1.3
<i>PATCH: Pump-Actuated Thermal Compression Haptics, pp. 643-649.</i>	
Goetz, Dustin	Ohio State University
Owusu-Antwi, David	Massachusetts Institute of Technology
Culbertson, Heather	University of Southern California
09:35-09:50	MoA1.4
<i>Interpersonal Vibrotactile Feedback Via Waves Transmitted through the Skin: Mechanics and Perception, pp. 650-656.</i>	
Hachisu, Taku	University of Tsukuba
Reardon, Gregory	University of California, Santa Barbara
Shao, Yitian	University of California, Santa Barbara
Suzuki, Kenji	University of Tsukuba
Visell, Yon	UC Santa Barbara
09:50-10:00	MoA1.5
<i>Habituation to Pseudo-Ambient Vibrotactile Patterns for Remote Awareness, pp. 657-663.</i>	
Blum, Jeffrey R.	McGill University
Cauchard, Jessica	Ben Gurion University of the Negev
Cooperstock, Jeremy	McGill University
10:00-10:10	MoA1.6
<i>Effects of Motion Parameters on Acceptability of Human-Robot Padding Touch, pp. 664-670.</i>	
Zamani, Naghmeh	University of Southern California
Moolchandani, Pooja	Georgia Institute of Technology
Fitter, Naomi T.	University of Southern California
Culbertson, Heather	University of Southern California
10:10-10:20	MoA1.7
<i>Preliminary Investigation of Across-Body Vibrotactile Pattern for the Design of Affective Furniture, pp. 671-676.</i>	
Chandra, Yurike	Keio University
Tag, Benjamin	School of Computing and Information Systems, University of Melbo
Peiris, Roshan	Rochester Institute of Technology
Minamizawa, Kouta	Keio University
10:20-10:30	MoA1.8

The Calming Effect of Heartbeat Vibration, pp. 677-683.

Zhou, Yizhen	Tokyo Institute of Technology
Murata, Aiko	NTT Communication Science Laboratories
Watanabe, Junji	NTT Communication Science Laboratories

MoB2	Grand Ballroom, Salons JK
Oral Session 4A: Force Feedback (Oral Session)	

11:00-11:10	MoB2.1
<i>Evolving Dyadic Strategies for a Cooperative Physical Task, pp. 684-689.</i>	

Sheybani, Saber	Indiana University Bloomington
Izquierdo, Eduardo	Indiana University
Roth, Eatai	Indiana University

11:10-11:20	MoB2.2
<i>A Hybrid Active-Passive Actuation and Control Approach for Kinesthetic Handheld Haptics, pp. 690-697.</i>	

Dills, Patrick	University of Wisconsin - Madison
Colonnese, Nick, Nicholas	Facebook Reality Labs
Agarwal, Priyanshu	Facebook Inc
Zinn, Michael	University of Wisconsin - Madison

11:20-11:30	MoB2.3
<i>Contact-Free Nonplanar Haptics with a Spherical Electromagnet, pp. 698-704.</i>	

Zarate, Juan Jose	ETH Zurich
Langerak, Thomas	ETH Zurich
Thomaszewski, Bernhard	Université De Montréal
Hilliges, Otmar	ETH Zurich

11:30-11:40	MoB2.4
<i>Impact of Kinematic Structure on the Force Displayability of Planar Passive Haptic Devices, N/A.</i>	

Lacki, Maciej	Ontario Tech University
DeBoon, Brayden	University of Ontario Institute of Technology
Rossa, Carlos	Ontario Tech University

11:40-11:50	MoB2.5
<i>Effect of Direct Velocity Measurement on the Stability of Haptic Simulation Systems, pp. 712-717.</i>	

Luna Laija, Victor Alejandro	Queen's University
Ozdil, Pembe Gizem	Bogazici University
Hashtroodi-Zaad, Keyvan	Queen's University

11:50-12:00	MoB2.6
<i>Respecting the Coupled Dynamics: Haptic Feedback Carries Both Power and Information, pp. 718-723.</i>	

Cutlip, Steven	University of Michigan
Freudenberg, Jim	University of Michigan
Gillespie, Brent	University of Michigan

12:00-12:10	MoB2.7
<i>Evidence of Sensory Adaptation to Kinaesthetic Sensations in the Human Somatosensory System, pp. 724-730.</i>	

Weill-Duflos, Antoine	McGill University
Sakr, Sophia	Sorbonnes Université
Haliyo, Dogan Sinan	Sorbonne Université
Régnier, Stéphane	Sorbonne University

12:10-12:20	MoB2.8

Efficacy of Haptic Pedal Feel Compensation on Driving with Regenerative Braking, N/A.

Caliskan, Umut Patoglu, Volkan	Sabanci University Sabanci University
-----------------------------------	--

12:20-12:30 MoB2.9

Compact Series Visco-Elastic Joint (SVEJ) for Smooth Torque Control, N/A.

Chiaradia, Domenico	Scuola Superiore Sant'Anna, TeCIP Institute, PERCRO Laboratory,
Tiseni, Luca	Scuola Superiore Sant'Anna
Frisoli, Antonio	Scuola Superiore Sant'Anna

MoB3 Grand Ballroom, Salons AB

Oral Session 4B: Neuroscience and Biomechanics (Oral Session)

11:00-11:10 MoB3.1

*Changes in Normal Force During Passive Dynamic Touch:
Contact Mechanics and Perception, pp. 746-752.*

Gueorguiev, David	CNRS
Lambert, Julien	UCLouvain
Thonnard, Jean-Louis	Université Catholique De Louvain
Kuchenbecker, Katherine J.	Max Planck Institute for Intelligent Systems

11:10-11:20 MoB3.2

Tactile Exploration Strategies with Natural Compliant Objects Elicit Virtual Stiffness Cues, N/A.

Xu, Chang	University of Virginia
He, Hankun	University of Virginia
Hauser, Steven	University of Virginia
Gerling, Gregory J.	University of Virginia

11:20-11:30 MoB3.3

The Effect of Contact Surface Curvature on the Accuracy of Fingernail Imaging for Tactile Force Measurement, pp. 760-766.

Fallahinia, Navid	University of Utah
Mascaro, Stephen	University of Utah

11:30-11:40 MoB3.4

Compensating for Fingertip Size to Render Tactile Cues More Accurately, N/A.

Young, Eric	University of Pennsylvania
Gueorguiev, David	CNRS
Kuchenbecker, Katherine J.	Max Planck Institute for Intelligent Systems
Pacchierotti, Claudio	Centre National De La Recherche Scientifique (CNRS)

11:40-11:50 MoB3.5

Detection of Tactile Feedback on Touch-Screen Devices Using EEG Data, pp. 775-780.

Alsuradi, Haneen	New York University
Pawar, Chaitali	New York University
Park, Wanjoo	New York University Abu Dhabi
Eid, Mohamad	New York University Abu Dhabi

11:50-12:00 MoB3.6

On the Role of Lateral Force in Texture-Induced Motion Bias During Reaching Tasks, N/A.

Bettelani, Gemma Carolina	University of Pisa
Moscatelli, Alessandro	University of Rome Tor Vergata
Bianchi, Matteo	University of Pisa

12:00-12:10

MoB3.7

Phase Difference between Normal and Shear Forces During Tactile Exploration Represents Textural Features, N/A.

Hasegawa, Hikaru	Nagoya University
Okamoto, Shogo	Nagoya University
Yamada, Yoji	Nagoya University

12:10-12:20

MoB3.8

Three-Dimensional Measurement of Skin Displacement Using Index Matching and Stereoscopy, pp. 794-800.

Tanaka, Satoshi	University of Electro-Communications
Kaneko, Seitaro	University of Electro-Communications
Kajimoto, Hiroyuki	The University of Electro-Communications

12:20-12:30

MoB3.9

Relationship between Spatial Variations in Static Skin Deformation and Perceived Roughness of Macroscopic Surfaces, N/A.

Okamoto, Shogo	Nagoya University
Oishi, Ariei	Nagoya University

MoC1

Grand Ballroom, Salons ABJK

Oral Session 5: Haptic Displays (Oral Session)

16:00-16:10

MoC1.1

PUMAH : Pan-Tilt Ultrasound Mid-Air Haptics for Larger Interaction Workspace in Virtual Reality, N/A.

Howard, Thomas	CNRS
Marchal, Maud	INSA/INRIA
Lecuyer, Anatole	INRIA
Pacchierotti, Claudio	Centre National De La Recherche Scientifique (CNRS)

16:10-16:20

MoC1.2

SurfaceFlow: Large Area Haptic Display Via Compliant Liquid Dielectric Actuators, pp. 815-820.

Shao, Yitian	University of California, Santa Barbara
Ma, Siyuan	Microsoft Corporation
Yoon, Sang Ho	Microsoft
Visell, Yon	UC Santa Barbara
Holbery, James	Microsoft

16:20-16:30

MoC1.3

Ten Little Fingers, Ten Little Toes: Can Toes Match Fingers for Haptic Discrimination?, N/A.

Vyas, Preeti	McGill University
Al Taha, Feras	McGill University
Blum, Jeffrey R.	McGill University
Weill-Duflos, Antoine	McGill University
Cooperstock, Jeremy	McGill University

16:30-16:40

MoC1.4

Design and Validation of the Readable Device: A Single-Cell Electromagnetic Refreshable Braille Display, N/A.

Bettelani, Gemma Carolina	University of Pisa
Averta, Giuseppe	University of Pisa
Catalano, Manuel Giuseppe	Istituto Italiano Di Tecnologia
Leporini, Barbara	Isti-CNR
Bianchi, Matteo	University of Pisa

16:40-16:50

MoC1.5

Braille Display for Portable Device Using Flip-Latch Structured Electromagnetic Actuator, N/A.

Kim, Joonyeong	KAIST
Han, Byung-Kil	KAIST
Pyo, Dongbum	KAIST
Ryu, Semin	KAIST
Kim, Hanbyeol	KAIST
Kwon, Dong-Soo	KAIST

16:50-17:00

MoC1.6

StickyTouch: A Tactile Display with Changeable Adhesive Distribution, pp. 842-847.

Ishihara, Yoshitaka	Osaka University
Itoh, Yuichi	Osaka University
Shirai, Ryo	Osaka University
Fujita, Kazuyuki	Tohoku University
Takashima, Kazuki	Tohoku University
Onoye, Takao	Osaka University

Technical Program for Tuesday March 31, 2020

TuAT1	Grand Ballroom, Salons JK	Technology Park, Jaeyoung Korea Institute of Science and Technology
Oral Session 6A: Vibrotactile Feedback (Oral Session)		
09:00-09:10	TuAT1.1	
<i>The Predictive Perception of Dynamic Vibrotactile Stimuli Applied to the Fingertip, pp. 848-853.</i>		
de Grosbois, John	Baycrest Health Sciences	
Di Luca, Massimiliano	University of Birmingham	
King, Raymond	Oculus VR	
Ziat, Mounia	Bentley University	
09:10-09:20	TuAT1.2	
<i>A Rate-Scalable Perceptual Wavelet-Based Vibrotactile Codec, pp. 854-859.</i>		
Noll, Andreas	Technical University of Munich	
Güleçyüz, Başak	Technical University of Munich	
Hofmann, Alexander	Technical University of Munich	
Steinbach, Eckehard	Technical University of Munich	
09:20-09:30	TuAT1.3	
<i>Incidental Categorization of Vibrotactile Stimuli, N/A.</i>		
Martinez, Juan Sebastian	Purdue University	
Holt, Lori	Carnegie Mellon University	
Reed, Charlotte	Massachusetts Institute of Technology	
Tan, Hong	Purdue University	
09:30-09:40	TuAT1.4	
<i>Towards Multisensory Perception: Modeling and Rendering Sounds of Tool-Surface Interactions, N/A.</i>		
Lu, Shihuan	University of Southern California	
Chen, Yang	University of Southern California	
Culbertson, Heather	University of Southern California	
09:40-09:55	TuAT1.5	
<i>Dimensional Reduction for 6D Vibrotactile Display, N/A.</i>		
Zhang, Ruisi	University of Utah	
09:55-10:10	TuAT1.6	
<i>Vibrator Transparency: Re-Using Vibrotactile Signal Assets for Different Black Box Vibrators without Re-Designing, pp. 882-889.</i>		
Ujitoko, Yusuke	University of Electro-Communications, Hitachi, Ltd.,	
Sakurai, Sho	The University of Electro-Communications	
Hirota, Koichi	The University of Electro-Communications	
10:10-10:20	TuAT1.7	
<i>Edge Vibration Improves Ability to Discriminate Roughness Difference of Adjoining Areas, N/A.</i>		
Ban, Yuki	The University of Tokyo	
Ujitoko, Yusuke	University of Electro-Communications, Hitachi, Ltd.,	
Minamizawa, Kouta	Keio University	
10:20-10:30	TuAT1.8	
<i>Multi-Fingertip Vibrotactile Array Interface for 3D Virtual Interaction, pp. 898-903.</i>		
Baik, Siyeon	Korea Institute of Science and Technology (KIST)	
Han, IlHwan	KIST	
Park, Jung-Min	Korea Institute of Science and	
TuAT2	Grand Ballroom, Salons AB	
Oral Session 6B: Medical Haptics (Oral Session)		
09:00-09:15	TuAT2.1	
<i>Altering the Stiffness, Friction, and Shape Perception of Tangible Objects in Virtual Reality Using Wearable Haptics, N/A.</i>		
Villa Salazar, David Steeven	LMU Munich	
Pacchierotti, Claudio	Centre National De La Recherche Scientifique (CNRS)	
De tinguy de la girouliere, Xavier	INRIA	
Maciel, Anderson	Universidade Federal Do Rio Grande Do Sul	
Marchal, Maud	INSA/INRIA	
09:15-09:25	TuAT2.2	
<i>Soft Pneumatic Actuator for Rendering Anal Sphincter Tone, N/A.</i>		
Haghghi Osgouei, Reza	Imperial College London	
Marechal, Luc	Singapore University of Technology and Design	
Kontovounios, Christos	Imperial College London	
Bello, Fernando	Imperial College London	
09:25-09:40	TuAT2.3	
<i>Realistic Haptic Feedback for Material Removal in Medical Simulations, pp. 920-926.</i>		
Kalusche, Maximilian	University of Bremen, Institute for Computer Graphics and Virtua	
Weller, René	University of Bremen	
Hammer, Niels	Medical University of Graz, Department of Macroscopic and Clinic	
Pelliccia, Luigi	Chemnitz University of Technology	
Lorenz, Mario	Chemnitz University of Technology, Professorship Machine Tool De	
Zachmann, Gabriel	Machine Tool De University of Bremen	
09:40-09:50	TuAT2.4	
<i>Enabling In-Bore MRI-Guided Biopsies with Force Feedback, N/A.</i>		
Frishman, Samuel	Stanford University	
Kight, Ali	Stanford University	
Pirozzi, Ileana	Stanford University	
Coffey, Mela Camille	Virginia Tech	
Daniel, Bruce	Stanford University, Department of Radiology	
Cutkosky, Mark	Stanford University	
09:50-10:00	TuAT2.5	
<i>Wearable Dual-Frequency Vibrotactile System for Restoring Force and Stiffness Perception, N/A.</i>		
Gathmann, Timothee	Imperial College London	
Atashzar, S. Farokh	New York University (NYU), US	
Sagastegui, Patrick	Imperial College London	
Farina, Dario	Imperial College London	
10:00-10:10	TuAT2.6	

<i>Object Shape and Surface Topology Recognition Using Tactile Feedback Evoked through Transcutaneous Nerve Stimulation, N/A.</i>	Teodorescu, Catalin-Stefan Carlson, Tom Spreters, Tom Pacchierotti, Claudio Babel, Marie	IRISA Paris-Sud 11 Univ University College London, UK INSA, Univ Rennes, CNRS, Inria, IRISA Centre National De La Recherche Scientifique (CNRS) IRISA UMR CNRS 6074 - INRIA - INSA Rennes
Vargas, Luis Huang, He (Helen) Zhu, Yong Hu, Xiaogang	Joint Department of Biomedical Engineering at University of North Carolina State University and University of North Carolina North Carolina State University Joint Department of Biomedical Engineering at University of North Carolina State University	
10:10-10:20	TuAT2.7	11:50-12:00
<i>Exploring the Effectiveness of Haptic Alarm Displays for Critical Care Environments, pp. 948-954.</i>		<i>SwarmCloak: Landing of Two Micro-Quadrotors on Human Hands Using Wearable Tactile Interface Driven by Light Intensity, pp. 987-992.</i>
Alirezaei, Parisa Weill-Duflos, Antoine Schlesinger, Joseph Cooperstock, Jeremy	McGill University McGill University Vanderbilt University Medical Center McGill University	Tsykunov, Evgeny Agishev, Ruslan Ibrahimov, Roman Moriyama, Taha Labazanova, Luiza Kajimoto, Hiroyuki Tsetserukou, Dzmitry
10:20-10:30	TuAT2.8	12:00-12:10
<i>Contracture Diagnosis System Using Wearable Tactile Sensor, pp. 955-960.</i>	Suzuki, Takahiro Tanaka, Yoshihiro Niwa, Kazuhiro Saito, Takafumi	Skolkovo Institute of Science and Technology Skolkovo Institute of Science and Technology Skolkovo Institute of Technology and Science The University of Electro-Communications The Hong Kong Polytechnic University The University of Electro-Communications Skolkovo Institute of Science and Technology
TuBT Oral Session 7: Haptic Cues and Guidance (Oral Session)	Grand Ballroom, Salons ABJK	TuBT.6
11:00-11:15	TuBT.1	<i>Pseudo-Sensation of Walking Generated by Passive Whole-Body Motions in Heave and Yaw Directions, N/A.</i>
<i>Hand Guidance Using Grasping Metaphor and Wearable Haptics, pp. 961-967.</i>	Lisini Baldi, Tommaso D'Aurizio, Nicole Prattichizzo, Domenico	Amemiya, Tomohiro Kitazaki, Michiteru Ikei, Yasushi
11:15-11:25	TuBT.2	The University of Tokyo Toyohashi University of Technology Tokyo Metropolitan University
<i>Enhancing Physical Human Evasion of Moving Threats Using Tactile Cues, N/A.</i>	Bajpai, Aakash Powell, Justine Young, Aaron Mazumdar, Anirban	
11:25-11:40	TuBT.3	
<i>Spatially Separated Cutaneous Haptic Guidance for Training of a Virtual Sensorimotor Task, pp. 974-979.</i>	Smith, Casimir Pezent, Evan O'Malley, Marcia	Rice University Rice University Rice University
11:40-11:50	TuBT.4	
<i>Power Wheelchair Navigation Assistance Using Wearable Vibrotactile Haptics, N/A.</i>	Devigne, Louise Aggravi, Marco Bivaud, Morgane Balix, Nathan	IRISA UMR CNRS 6074 - INRIA - INSA Rennes - Rehabilitation Cente CNRS INSA, Univ Rennes, CNRS, Inria, IRISA INSA, Univ Rennes, CNRS, Inria,