

Contents – Part II

Haptic Illusion and Rehabilitation

Experimental Validation of a Rapid, Adaptive Robotic Assessment of the MCP Joint Angle Difference Threshold	3
<i>Mike D. Rinderknecht, Werner L. Popp, Olivier Lambercy, and Roger Gassert</i>	
Friction Sensation Produced by Laterally Asymmetric Vibrotactile Stimulus . . .	11
<i>Akihiro Imaizumi, Shogo Okamoto, and Yoji Yamada</i>	
Enhancing the Simulation of Boundaries by Coupling Tactile and Kinesthetic Feedback	19
<i>Yi Yang, Yuru Zhang, Betty Lemaire-Semail, and Xiaowei Dai</i>	
Find the Missing Element! Haptic Identification of Incomplete Pictures by Sighted and Visually Impaired Children	27
<i>Anais Mazella, Jean-Michel Albaret, and Delphine Picard</i>	
The Haptic Analog of the Visual Aubert-Fleischl Phenomenon	34
<i>Alessandro Moscatelli, Meike Scheller, Gabriele Joanna Kowalski, and Marc O. Ernst</i>	
Making Gestural Interaction Accessible to Visually Impaired People	41
<i>Anke Brock, Philippe Truillet, Bernard Oriola, and Christophe Jouffrais</i>	
Collaborative Pseudo-Haptics: Two-User Stiffness Discrimination Based on Visual Feedback	49
<i>Ferran Argelaguet, Takuya Sato, Thierry Duval, Yoshifumi Kitamura, and Anatole Lécuyer</i>	
Centralizing Bias and the Vibrotactile Funneling Illusion on the Forehead . . .	55
<i>Hamideh Kerdegari, Yeongmi Kim, Tom Stafford, and Tony J. Prescott</i>	
Haptic Rendering for Under-Actuated 6/3-DOF Haptic Devices	63
<i>Petr Kadleček, Petr Kmoch, and Jaroslav Křivánek</i>	
A Change in the Fingertip Contact Area Induces an Illusory Displacement of the Finger	72
<i>Alessandro Moscatelli, Matteo Bianchi, Alessandro Serio, Omar Al Atassi, Simone Fani, Alexander Terekhov, Vincent Hayward, Marc O. Ernst, and Antonio Bicchi</i>	

Illusory Rotations in the Haptic Perception of Moving Spheres and Planes . . .	80
<i>Astrid M.L. Kappers and Wouter M. Bergmann Tiest</i>	
Distinct Pseudo-Attraction Force Sensation by a Thumb-Sized Vibrator that Oscillates Asymmetrically	88
<i>Tomohiro Amemiya and Hiroaki Gomi</i>	
Obstacle Identification and Avoidance Using the ‘EyeCane’: a Tactile Sensory Substitution Device for Blind Individuals	96
<i>Galit Buchs, Shachar Maidenbaum, and Amir Amedi</i>	
Assessment of Tactile Languages as Navigation Aid in 3D Environments . . .	104
<i>Victor Adriel de J. Oliveira and Anderson Maciel</i>	
Altering Distance Perception from Hitting with a Stick by Superimposing Vibration to Holding Hand	112
<i>Ryuta Okazaki and Hiroyuki Kajimoto</i>	
Passive Mechanical Skin Stretch for Multiple Degree-of-Freedom Proprioception in a Hand Prosthesis	120
<i>Aadeel Akhtar, Mary Nguyen, Logan Wan, Brandon Boyce, Patrick Slade, and Timothy Bretl</i>	
Robotics or Medical Applications	
A Visual-Haptic Multiplexing Scheme for Teleoperation Over Constant-Bitrate Communication Links	131
<i>Burak Cizmeci, Rahul Chaudhari, Xiao Xu, Nicolas Alt, and Eckehard Steinbach</i>	
Low-Cost 5-DOF Haptic Stylus Interaction Using Two Phantom Omni Devices	139
<i>Mats Isaksson, Ben Horan, and Saeid Nahavandi</i>	
The Effects of Force Feedback on Surgical Task Performance: A Meta-Analytical Integration	150
<i>Bernhard Weber and Sonja Schneider</i>	
Switching Robust Control Synthesis for Teleoperation via Dwell Time Conditions	158
<i>César A. López Martínez, René van de Molengraft, and Maarten Steinbuch</i>	
Performance Evaluation of a Surgical Telerobotic System Using Kinematic Indices of the Master Hand-Controller	167
<i>Yaster Maddahi, Michael Greene, Liu Shi Gan, Tomas Hirmer, Rachael L’Orsa, Sanju Lama, Garnette Roy Sutherland, and Kourosh Zareinia</i>	

Development of Two-Handed Multi-finger Haptic Interface SPIDAR-10 176
*Lanhai Liu, Satoshi Miyake, Naoki Maruyama, Katsuhito Akahane,
and Makoto Sato*

A Human-Like Bilateral Tele-Handshake System: Preliminary Development. . . 184
Sungjun Park, Sangsoo Park, Sang-Yun Baek, and Jeha Ryu

Evaluation of Stretchable Conductor for Measuring Clothing Pressure 191
*Katsunari Sato, Sayasa Otsubo, Teppei Araki, Tohru Sugahara,
and Katsuaki Suganuma*

The LegoPress: A Rehabilitation, Performance Assessment
and Training Device Mechanical Design and Control. 198
Jeremy Olivier, Maxime Jeanneret, Mohamed Bouri, and Hannes Bleuler

Receiver-Based Hybrid Sample Prediction for Error-Resilient
Haptic Communication 206
Fernanda Brandi and Eckehard Steinbach

Multi-digit Softness: Development of a Tactile Display to Render Softness
Feeling on Multiple Fingers 215
Toshiki Kitazawa, Fuminobu Kimura, and Akio Yamamoto

Haptic Rendering on Deformable Anatomical Tissues with Strong
Heterogeneities 223
*Guillaume Kazmitcheff, Hadrien Courtecuisse, Yann Nguyen,
Mathieu Miroir, Alexis Bozorg Grayeli, Stéphane Cotin,
Olivier Sterkers, and Christian Duriez*

Grasping Control in Three-Fingered Robot Hand Teleoperation
Using Desktop Haptic Device. 232
Lingzhi Liu, Guanyang Liu, and Yuru Zhang

A High-Fidelity Surface-Haptic Device for Texture Rendering on Bare Finger. . . 241
*Michaël Wiertlewski, Daniele Leonardis, David J. Meyer,
Michael A. Peshkin, and J. Edward Colgate*

Task-Oriented Approach to Simulate a Grasping Action Through
Underactuated Haptic Devices 249
Leonardo Meli and Domenico Prattichizzo

Integration of a Particle Jamming Tactile Display with a Cable-Driven
Parallel Robot. 258
Andrew A. Stanley, David Mayhew, Rikki Irwin, and Allison M. Okamura

Humanoid Robot Teleoperation with Vibrotactile Based Balancing Feedback . . . 266
*Anais Brygo, Ioannis Sarakoglou, Nadia Garcia-Hernandez,
and Nikolaos Tsagarakis*

Comparison of Multimodal Notifications During Telesurgery 276
*Rachael L’Orsa, Kouros Zareinia, Chris Macnab,
and Garnette Roy Sutherland*

A Multi-DOF Haptic Representation Using Suction Pressure Stimuli
on Finger Pads 285
Daiki Maemori, Lope Ben Porquis, Masashi Konyo, and Satoshi Tadokoro

Evaluating the BioTac’s Ability to Detect and Characterize Lumps
in Simulated Tissue 295
Jennifer C.T. Hui and Katherine J. Kuchenbecker

Modeling and Simulation

A Genetic Algorithm Approach to Identify Virtual Object Properties
for Sharing the Feel from Virtual Environments 305
Yongyao Yan, Greg S. Ruthenbeck, and Karen J. Reynolds

Estimation of Finger Pad Deformation Based on Skin Deformation
Transferred to the Radial Side 313
Yoichiro Matsuura, Shogo Okamoto, and Yoji Yamada

Haptic Rendering of Tissue Stiffness by the Haptic Enhanced Reality Method. . . 320
Yoshihide Otsuru, Toshio Tsuji, and Yuichi Kurita

Simulation of Soft Finger Contact Model with Rolling Effects
in Point-Contact Haptic Interfaces 326
Gionata Salvietti, Monica Malvezzi, and Domenico Prattichizzo

Haptics Processing Unit Software Architecture for Transportable
High Dynamics Force-Feedback Coupling 334
Annie Luciani, Nicolas Castagne, and James Leonard

Geometrically Limited Constraints for Physics-Based Haptic Rendering. 343
Thomas Knott and Torsten Kuhlen

Vibration and Subsequent Collision Simulation of Finger and Object
for Haptic Rendering. 352
*Shoichi Hasegawa, Yukinobu Takehana, Alfonso Balandra,
Hironori Mitake, Katsuhito Akahane, and Makoto Sato*

Computational Modeling Reinforces that Proprioceptive Cues May
Augment Compliance Discrimination When Elasticity Is Decoupled
from Radius of Curvature. 360
Yuxiang Wang and Gregory J. Gerling

Electrovibration Modeling Analysis. 369
Eric Vezzoli, Michel Amberg, Frédéric Giraud, and Betty Lemaire-Semail

Functional Microanatomical Model of Meissner Corpuscle 377
*Teja Vodlak, Zlatko Vidrih, Primoz Pirih, Ales Skorjanc, Janez Presern,
and Tomaz Rodic*

Modeling Pneumatic Actuators for a Refreshable Tactile Display 385
*Alexander Russomanno, R. Brent Gillespie, Sile O’Modhrain,
and James Barber*

Modeling the Weber Fraction of Vibrotactile Amplitudes Using Gain Control
Through Global Feedforward Inhibition 394
Ken E. Friedl, Yao Qin, Daniel Ostler, and Angelika Peer

Device for Estimation of Weight and Material of Contents by Shaking 403
Takeshi Yamamoto and Koichi Hirota

Erratum to: Performance Evaluation of a Surgical Telerobotic System
Using Kinematic Indices of the Master Hand-Controller. E1
*Yaser Maddahi, Michael Greene, Liu Shi Gan, Tomas Hirmer,
Rachael L’Orsa, Sanju Lama, Garnette Roy Sutherland,
and Kourosch Zareinia*

Demo Papers

Demonstration: Passive Mechanical Skin Stretch for Multiple
Degree-of-Freedom Proprioception in a Hand Prosthesis 413
*Aadeel Akhtar, Mary Nguyen, Logan Wan, Brandon Boyce,
and Patrick Slade, Timothy Bretl*

The PROTOTOUCH Project: an FP7 EU Marie Curie Initial
Training Network 416
*Mario Amante, Séréna Bochereau, Mariama Dione,
Brygida Maria Dzidek, David Gueorguiev, Andreas Heinrich,
Athanasia Mounon, Thomas Sednaoui, Eric Vezzoli, Zlatko Vidrih,
Teja Vodlak, and Michael Wand*

Distinct Pseudo-Attraction Force Sensation by a Thumb-Sized Vibrator
that Oscillates Asymmetrically 419
Tomohiro Amemiya, and Hiroaki Gomi

Analysis of the Adapted Inclusive Haptic Rigs for Non-sighted People
Using Duration and Collision Metrics 421
Lisa Bowers, and Farshid Amriabdollahian

Haptic Music Player 423
Alfonso Balandra, Hironori Mitake, and Shoichi Hasegawa

Demonstration of the Vibration and Collision Between Finger and Object for Haptic Rendering.	425
<i>Alfonso Balandra, Shoichi Hasegawa, Yukinobu Takehana, Hironori Mitake, Katsuhito Akahane, and Makoto Sato</i>	
Transfer of Haptic Signals Between Hands.	427
<i>Lucile Dupin, Vincent Hayward, and Mark Wexler</i>	
Demonstration: A Digital Coach for Self-Tracking Athletes	430
<i>Antoine Hogenboom, Iskander Smit, and Ben Kröse</i>	
Reconfigurable Multipurpose Haptic Interface.	432
<i>Ben Horan, Syafizwan Faroque, Mats Isaksson, and Quan-Zen Ang</i>	
Demo: The (Un)predictability of Visuo-Haptic and Haptic-Haptic Biases.	435
<i>Irene A. Kuling, Marieke C.W. van der Graaff, Eli Brenner, and Jeroen B.J. Smeets</i>	
Haptic Rendering of Tissue Stiffness by the Haptic Enhanced Reality Method.	438
<i>Yoshihide Otsuru, Toshio Tsuji, and Yuichi Kurita</i>	
A Multi-DOF Haptic Representation Using Suction Pressure Stimuli on Finger Pads	440
<i>Daiki Maemori, Lope Ben Porquis, Masashi Konyo, and Satoshi Tadokoro</i>	
High-Fidelity Haptic Device.	443
<i>Guillaume Millet, Abdenbi Mohand Ousaid, Antoine Weill-Duflos, and Stéphane Régnier</i>	
A Tactile Display Using Pneumatic Membrane Actuators.	445
<i>Alexander Russomanno, R. Brent Gillespie, Sile O’Modhrain, and James Barber</i>	
Several Discrete Stimuli to Whole Fingers Provide Surface Undulation Perception	448
<i>Yoshihiro Tanaka, Yuki Goto, Masayoshi Hashimoto, Tomohiro Fukuda, Koji Watanabe, Nagomi Tsuboi, Nguyen Duy Phuong, and Akihito Sano</i>	
Motors and Music: Teaching Haptics and Sound for Product Design.	451
<i>Bill Verplank, David Gauthier, and Masayoshi Hashimoto</i>	

Demonstration: A High-Fidelity Surface-Haptic Device for Texture Rendering on Bare Finger 454
Michaël Wiertlewski, Daniele Leonardis, David J. Meyer, Michael A. Peshkin, and J. Edward Colgate

Tactile Modulator: Roughness Modulation Using Electrotactile Augmentation . . . 456
Shunsuke Yoshimoto, Yoshihiro Kuroda, and Masataka Imura

Demonstration: Learning Spatial Touch in an Artificial Skin with Neural Network 458
G. Pugach, A. Pitti, A. Melnyk, P. Henaff, and P. Gaussier

Facilitating Planning: Tangible Objects with Multimodal Feedback Mitigate Cognitive Workload 461
Werner de Valk, Jouke Rypkema, and Jan B.F. van Erp

Under-actuated Hand Exoskeleton with Novel Kinematics for Haptic Interaction with Virtual Objects 463
Nadia Garcia-Hernandez, Ioannis Sarakoglou, Nikos Tsagarakis, and Darwin Caldwell

Haptic Broadcasting 466
Yusuke Mizushina, Charith Lasantha Fernando, Kouta Minamizawa, and Susumu Tachi

Tactile Vision Substitution System for Palm Using Electro-Tactile Display and Smartphone 469
Hiroyuki Kajimoto, Masaki Suzuki, and Yonezo Kanno

Developing Immersive Virtual Worlds through Realistic Contact Rendering and Improved Transparency 472
Arash Mohtat, Colin Gallacher, and Jozsef Kovecses

Localization Ability and Polarity Effect of Underwater Electro-Tactile Stimulation 475
Taira Nakamura, Manami Katoh, Taku Hachisu, Ryuta Okazaki, Michi Sato, and Hiroyuki Kajimoto

Diminished Haptics: Towards Digital Transformation of Real World Textures . . . 478
Yoichi Ochiai, Takayuki Hoshi, Jun Rekimoto, and Masaya Takasaki

Altering Distance Perception from Hitting with a Stick by Superimposing Vibration to Holding Hand 480
Ryuta Okazaki, and Hiroyuki Kajimoto

Surface Haptic Interaction 483
Semin Ryu, Dongbum Pyo, Seung-Chan Kim, and Dong-Soo Kwon

Sensators: Active Multisensory Tangible User Interfaces 485
*Jan B.F. van Erp, Christian J.A.M. Willemse,
Joris B. Janssen, and Alexander Toet*

Haptic Technical Aids for Environmental Perception, Time Perception
and Mobility (in a Riding Arena) for Persons with Deafblindness 488
Parivash Ranjbar, Dag Stranneby, Cheryl Akner-Koler, and Erik Borg

Author Index 491

Contents – Part I

Fundamentals of Haptic Perception

Semantically Layered Structure of Tactile Textures	3
<i>Hikaru Nagano, Shogo Okamoto, and Yoji Yamada</i>	
Roughness Modulation of Real Materials Using Electrotactile Augmentation . . .	10
<i>Shunsuke Yoshimoto, Yoshihiro Kuroda, Yuki Uranishi, Masataka Imura, and Osamu Oshiro</i>	
Proprioceptive Biases in Different Experimental Designs	18
<i>Irene A. Kuling, Marieke C.W. van der Graaff, Eli Brenner, and Jeroen B.J. Smeets</i>	
Delayed Haptic Feedback to Gaze Gestures	25
<i>Jari Kangas, Jussi Rantala, Deepak Akkil, Poika Isokoski, Päivi Majaranta, and Roope Raisamo</i>	
A System for Evaluating Tactile Feelings Expressed by Sound Symbolic Words	32
<i>Ryuichi Doizaki, Junji Watanabe, and Maki Sakamoto</i>	
Does Just Noticeable Difference Depend on the Rate of Change of Kinesthetic Force Stimulus?	40
<i>Amit Bhardwaj and Subhasis Chaudhuri</i>	
Subject-Specific Distortions in Haptic Perception of Force Direction	48
<i>Femke E. van Beek, Wouter M. Bergmann Tiest, Frank L. Gabrielse, Bart W.J. Lagerberg, Thomas K. Verhoogt, Bart G.A. Wolfs, and Astrid M.L. Kappers</i>	
Perceptual Evaluation of the Passive/Active Torque and Stiffness Asymmetry of a Hybrid Haptic Device	55
<i>Carlos Rossa, Margarita Anastassova, Alain Micaelli, and José Lozada</i>	
Vibrotactile Frequency Discrimination Performance with Cross-Channel Distractors	61
<i>Scinob Kuroki, Junji Watanabe, and Shin'ya Nishida</i>	
Weights in Visuo-Haptic Softness Perception are not Sticky	68
<i>Knut Drewing and Onno Kruse</i>	

Haptic Shape Constancy Across Distance.	77
<i>Jess Hartcher-O'Brien, Alexander Terekhov, Malika Auvray, and Vincent Hayward</i>	
Response Time-Dependent Force Perception During Hand Movement	85
<i>Markus Rank and Massimiliano Di Luca</i>	
Amplitude and Duration Interdependence in the Perceived Intensity of Complex Tactile Signals	93
<i>S��r��na Bochereau, Alexander Terekhov, and Vincent Hayward</i>	
Multi-digit Position and Force Coordination in Three- and Four-Digit Grasping.	101
<i>Abdeljallil Naceri, Alessandro Moscatelli, Marco Santello, and Marc O. Ernst</i>	
Role of Occlusion in Non-Coulombic Slip of the Finger Pad	109
<i>Brygida Maria Dzidek, Michael Adams, Zhibing Zhang, Simon Johnson, S��r��na Bochereau, and Vincent Hayward</i>	
An Analysis of the Influence of a Pseudo-haptic Cue on the Haptic Perception of Weight.	117
<i>Karljohan Lundin Palmerius, Daniel Johansson, Gunnar H��st, and Konrad Sch��nborn</i>	
Perceived Softness of Composite Objects.	126
<i>Massimiliano Di Luca</i>	
Evaluating Virtual Embodiment with the ALEx Exoskeleton	133
<i>Emanuele Ruffaldi, Michele Barsotti, Daniele Leonardis, Giulia Bassani, Antonio Frisoli, and Massimo Bergamasco</i>	
Vibrotactile Stimuli for Distinction of Virtual Constraints and Environment Feedback	141
<i>Adrian Ramos and Domenico Prattichizzo</i>	
Rendering of Virtual Walking Sensation by a Passive Body Motion	150
<i>Yasushi Ikei, Seiya Shimabukuro, Shunki Kato, Yujiro Okuya, Koji Abe, Koichi Hirota, and Tomohiro Amemiya</i>	
Human Computer Interaction	
Touch Accessibility on the Front and the Back of Held Tablet Devices	161
<i>Katrin Wolf, Robert Schleicher, and Michael Rohs</i>	
Multisensory Memory for Object Identity and Location	169
<i>Jan B.F. van Erp, Tom G. Philippi, and Peter J. Werkhoven</i>	

Interaction-Based Dynamic Measurement of Haptic Characteristics of Control Elements	177
<i>Wenliang Zhou, Jörg Reisinger, Angelika Peer, and Sandra Hirche</i>	
Optimal Exploration Strategies in Haptic Search	185
<i>Vonne van Polanen, Wouter M. Bergmann Tiest, Noortje Creemers, Merel J. Verbeek, and Astrid M.L. Kappers</i>	
Encountered-Type Haptic Interface for Grasping Interaction with Round Variable Size Objects via Pneumatic Balloon	192
<i>Noman Akbar and Seokhee Jeon</i>	
Hand-Skill Learning Using Outer-Covering Haptic Display	201
<i>Vibol Yem, Hideaki Kuzuoka, Naomi Yamashita, Shoichi Ohta, and Yasuo Takeuchi</i>	
Audio-Haptic Car Navigation Interface with Rhythmic Tactons.	208
<i>Toni Pakkanen, Roope Raisamo, and Veikko Surakka</i>	
Localization Ability and Polarity Effect of Underwater Electro-Tactile Stimulation.	216
<i>Taira Nakamura, Manami Katoh, Taku Hachisu, Ryuta Okazaki, Michi Sato, and Hiroyuki Kajimoto</i>	
Perceptual Strategies Under Constrained Movements on a Zoomable Haptic Mobile Device	224
<i>Mounia Ziat, Eric Lecolinet, Olivier Gapenne, Gerard Mouret, and Charles Lenay</i>	
Improved Haptic Music Player with Auditory Saliency Estimation	232
<i>Inwook Hwang and Seungmoon Choi</i>	
An Initial Study on Pitch Correction Guidance for String Instruments Using Haptic Feedback	241
<i>Yongjae Yoo and Seungmoon Choi</i>	
Simulated Social Touch in a Collaborative Game	248
<i>Gijs Huisman, Jan Kolkmeier, and Dirk Heylen</i>	
Towards Palpation in Virtual Reality by an Encountered-Type Haptic Screen.	257
<i>Sergio Portolés Diez, Emmanuel B. Vander Poorten, Gianni Borghesan, and Dominiek Reynaerts</i>	
Haptic Expressions of Stress During an Interactive Game.	266
<i>Yoren Gaffary, Jean-Claude Martin, and Mehdi Ammi</i>	

Grasp Mapping Between a 3-Finger Haptic Device and a Robotic Hand	275
<i>Francisco Suárez-Ruiz, Ignacio Galiana, Yaroslav Tenzer, Leif P. Jentoft, Robert D. Howe, and Manuel Ferre</i>	
The HapBand: A Cutaneous Device for Remote Tactile Interaction	284
<i>Francesco Chinello, Mirko Aurilio, Claudio Pacchierotti, and Domenico Prattichizzo</i>	
Similarity of Blind and Sighted Subjects When Constructing Maps with Small-Area Tactile Displays: Performance, Behavioral and Subjective Aspects	292
<i>Mariacarla Memeo, Claudio Campus, Laura Lucagrossi, and Luca Brayda</i>	
Scale Dependence of Force Patterns During the Scanning of a Surface by a Bare Finger.	301
<i>Marco Janko, Richard Primerano, and Yon Visell</i>	
Introducing the Modifier Tactile Pattern for Vibrotactile Communication	309
<i>Victor Adriel de J. Oliveira and Anderson Maciel</i>	
CARess, a Gentle Touch Informs the Driver.	317
<i>Stefano Trento, Amalia de Götzen, and Stefania Serafin</i>	
Text Entry Performance Evaluation of Haptic Soft QWERTY Keyboard on a Tablet Device	325
<i>Byung-Kil Han, Kwangtaek Kim, Koji Yatani, and Hong Z. Tan</i>	
Morphing Tactile Display for Haptic Interaction in Vehicles.	333
<i>Christian Bolzmacher, Gérard Chalubert, Olivier Brelaud, Jean-Philippe Alexander, and Moustapha Hafez</i>	
Static Force Rendering Performance of Two Commercial Haptic Systems	342
<i>Fabio Tatti, Netta Gurari, and Gabriel Baud-Bovy</i>	
Adaptation to Motion Presented with a Tactile Array.	351
<i>Sarah McIntyre, Tatjana Seizova-Cajic, Ingvars Birznieks, Alex O. Holcombe, and Richard M. Vickery</i>	
Design and Evaluation of a Peaucellier-Lipkin Linkage Based Haptic Interface.	360
<i>Sanditi Khandelwal, Manas Karandikar, and Abhishek Gupta</i>	
Haptic Feedback Intensity Affects Touch Typing Performance on a Flat Keyboard	369
<i>Jin Ryong Kim and Hong Z. Tan</i>	

Surface or Texture Perception and Display

Time Course of Grouping by Proximity and Similarity in a Haptic Speeded Orientation Task 379
Antonio Prieto, Julia Mayas, and Soledad Ballesteros

Unequal but Fair? Weights in the Serial Integration of Haptic Texture Information. 386
Alexandra Lezkan and Knut Drewing

The Influence of Material Cues on Early Grasping Force 393
Wouter M. Bergmann Tiest and Astrid M.L. Kappers

A Robust Real-Time 3D Tracking Approach for Assisted Object Grasping. . . 400
Claudio Loconsole, Fabio Stroppa, Vitoantonio Bevilacqua, and Antonio Frisoli

Diminished Haptics: Towards Digital Transformation of Real World Textures . . . 409
Yoichi Ochiai, Takayuki Hoshi, Jun Rekimoto, and Masaya Takasaki

A Data-Driven Approach to Remote Tactile Interaction: From a BioTac Sensor to any Fingertip Cutaneous Device 418
Claudio Pacchierotti, Domenico Prattichizzo, and Katherine J. Kuchenbecker

Lateral Skin Stretch Influences Direction Judgments of Motion Across the Skin 425
Tatjana Seizova-Cajic, Kornelia Karlsson, Sara Bergstrom, Sarah McIntyre, and Ingvars Birznieks

On the Effect of Vibration on Slip Perception During Bare Finger Contact. . . 432
Hikaru Nagano, Yon Visell, and Shogo Okamoto

Presentation of Surface Undulation to Hand by Several Discrete Stimuli 439
Yoshihiro Tanaka, Yuki Goto, and Akihito Sano

Roughness Perception of Micro-particulate Plate: A Study on Two-Size-Mixed Stimuli 446
Hiroki Tsuboi, Makoto Inoue, Scinob Kuroki, Hiromi Mochiyama, and Junji Watanabe

Design of a Haptic Magnifier Using an Ultrasonic Motor. 453
Frédéric Giraud, Michel Amberg, Christophe Giraud-Audine, and Betty Lemaire-Semail

Classification of Texture and Frictional Condition at Initial Contact by Tactile Afferent Responses 460
Heba Khamis, Stephen J. Redmond, Vaughan Macefield, and Ingvars Birznieks

Exploring the Role of Dynamic Audio-Haptic Coupling in Musical Gestures on Simulated Instruments	469
<i>James Leonard, Jean-Loup Florens, Claude Cadoz, and Nicolas Castagné</i>	
A Device and Method for Multimodal Haptic Rendering of Volumetric Stiffness	478
<i>Yon Visell, Keerthi Adithya Duraikkannan, and Vincent Hayward</i>	
A New Surface Display for 3D Haptic Rendering	487
<i>Dongbum Pyo, Semin Ryu, Seung-Chan Kim, and Dong-Soo Kwon</i>	
Data-Driven Texture Rendering with Electrostatic Attraction	496
<i>Gholamreza Ilkhani, Mohammad Aziziaghdam, and Evren Samur</i>	
Design of a Miniature Integrated Haptic Device for Cutaneous, Thermal and Kinaesthetic Sensations	505
<i>Tae-Heon Yang, Yu-Joon Kim, Yon-Kyu Park, and Sang-Youn Kim</i>	
Virtual Roughness Perception Using Coil Array Magnetic Levitation Haptic Interface: Effects of Torque Feedback	513
<i>Sahba Aghajani Pedram, Roberta Klatzky, Oran Isaac-Lowry, and Peter Berkelman</i>	
Recording Device for Natural Haptic Textures Felt with the Bare Fingertip . . .	521
<i>Jonathan Platkiewicz, Alessandro Mansutti, Monica Bordegoni, and Vincent Hayward</i>	
Virtual Surface Textures Created by MEMS Tactile Display	529
<i>Yumi Kosemura, Junpei Watanabe, Hiroaki Ishikawa, and Norihisa Miki</i>	
Toward Active Boundary Conditions for Variable Friction Touchscreens	535
<i>Hoechel Lee, Karl Katumu, and Jenna Gorlewicz</i>	
Tactile Display to Represent Stiffness Distribution of Human Tissue Using Magnetorheological Fluid	544
<i>Hiroki Ishizuka, Nicolo Rorenzoni, and Norihisa Miki</i>	
Microfabricated Needle-Arrays for Stimulation of Tactile Receptors	552
<i>Norihide Kitamura, Julien Chim, and Norihisa Miki</i>	
Erratum to: Haptics: Neuroscience, Devices, Modeling, and Applications (Part II)	E1
<i>Malika Auvray and Christian Duriez</i>	
Author Index	559



<http://www.springer.com/978-3-662-44195-4>

Haptics: Neuroscience, Devices, Modeling, and Applications
9th International Conference, EuroHaptics 2014,
Versailles, France, June 24-26, 2014, Proceedings, Part II
Auvray, M.; Duriez, C. (Eds.)
2014, XXVI, 495 p. 248 illus., Softcover
ISBN: 978-3-662-44195-4