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# Yon Visell

Haptics, Robotics, Human-Computer Interaction, VR

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## Education

2011	<b>PhD Electrical and Computer Engineering</b>	<b>McGill University</b>
1999	<b>MA Physics</b>	<b>The University of Texas, Austin</b>
1995	<b>BA Physics</b>	<b>Wesleyan University</b>

## Experience

2015–Present	<b>Assistant Professor</b> Media Arts and Technology Graduate Program Department of Electrical and Computer Engineering Department of Mechanical Engineering (affiliate) California NanoSystems Institute	University of California, Santa Barbara
2013–2015	<b>Assistant Professor</b> Department of Electrical and Computer Engineering	Drexel University
2011–2012	<b>Postdoctoral Researcher</b> Institute of Intelligent Systems & Robotics	Université Pierre et Marie Curie - Paris 6
2006–2011	<b>Research Fellow</b> Interaction Design Program	Zurich University of the Arts
2004–2006	<b>Interactive Art + Technology</b> Large scale artistic installations	FoAM (Belgium), Zero-Th (Croatia)
1999–2004	<b>Industrial Research and Development</b> Sonar, Speech recognition, Audio DSP	Ableton, Loquendo (Nuance), ARL (Austin) Interaction Design Institute Ivrea

## Research Highlights

**Author** of 50+ articles in journals, conferences, and books in science and engineering, and two haptic technology patents.

**Awarded** more than \$2M in research funding, including more than \$1.15M as PI.

**h-index:** 16 (Google Scholar). More than 500 citations since 2010.

**Published in:** Proceedings of the National Academy of Sciences (PNAS), Applied Physics Letters, Europhysics Letters (EPL), Smart Materials and Structures, PLoS one, J Acoustical Society of America, IEEE Transactions on Haptics, and others.

**Editor** of two books on virtual reality, including *Human Walking in Virtual Reality*, Springer Series in Engineering, 2013.

**Google Faculty Research Award**, 2016.

**Two best paper awards** at IEEE Haptics Symposium (2010 and 2016). One best paper runner up (2016).

**Best paper finalist** at EuroHaptics (in 2014) and IEEE Haptics Symposium (four times)

**Lead DSP designer and programmer** for multiple award winning music software *Ableton Live* (millions of users).

**Exhibition, performance, and outreach at major international venues** including Centre Pompidou, SIGGRAPH Emerging Technologies, Ars Electronica, La Gaité Lyrique, Design Biennale St. Etienne, Philadelphia Science Festival, and others.

**Radio Host**, *The Unknown Territories*, a weekly program on contemporary science and music, broadcast via KCSB FM and online.

## Professional Service Highlights

**Lead Guest Editor**, IEEE Transactions on Haptics, Special Issue on Active Touch Sensing (2015).

**Program Chair**, EuroHaptics Conference, the primary haptics conference in Europe (2016).

**Local Arrangements Chair**, IEEE Haptics Symposium, the primary haptics conference in the USA (2016).

**Organizer** of the IEEE/RSJ IROS 2014 Workshop on Active Touch Sensing in Robots and Animals, and the ACM CHI 2013 Course on Walking in VR, and several other academic workshops and symposia.

## Teaching and Mentoring

**Advisor** to four current PhD students. The first will defend in 2016. Mentor to multiple graduate and undergraduate students.

**Teaching experience** in linear and nonlinear control systems, haptics, human-computer interaction, interactive arts, AI, robotics.

**Highly rated as an instructor** in eight courses taught at Drexel University, with a mean instructor rating of 4.7/5.0.

Immersion Ex 2002-1  
Apple v Immersion  
IPR2017-01368

# Publications

## Books

- Y. Visell, M. Hartmann, V. Hayward, N. Lepora (guest editors), *Active Touch Sensing in Humans, Robots, and Other Animals*. IEEE Transactions on Haptics, 2016.
- F. Steinecke, Y. Visell, J. Campos, A. Lecuyer (eds.), *Human Walking in Virtual Environments: Perception, Technology, and Applications*. Springer Verlag Series in Engineering (January, 2013). ISBN: 978-1-4419-8431-9.
- F. Fontana\*, Y. Visell\* (eds.), *Walking with the Senses: Non-visual perceptual techniques for walking in simulated environments*. Logos Verlag, ISBN: 978-3-8325-2967-3, 2012. (\* Equal contrib.)

## Journal Articles

- Y. Shao, V. Hayward, Y. Visell, *Spatial Patterns of Cutaneous Vibration During Whole-Hand Haptic Interaction*. Proc Nat Acad Sci, March, 2016.
- B. Li, Y. Gao, A. K. Fontecchio, Y. Visell, *Soft capacitive tactile sensing arrays fabricated via direct filament casting*. Smart Materials and Structures, To Appear, 2016.
- B. Li, A. K. Fontecchio, Y. Visell, *Mutual capacitance of liquid conductors in deformable tactile sensing arrays*. Applied Physics Letters 108, 2016.
- M. Janko, R. Primerano, Y. Visell, *On Frictional Forces Between the Finger and a Textured Surface During Active Touch*. IEEE Transactions on Haptics, 2016.
- Y. Visell, *Fast, physically accurate rendering of multimodal signatures of distributed fracture in heterogeneous materials*. IEEE Transactions on Computer Graphics and Visualization, 2015.
- Y. Visell, G. Millet, *Fracture in Disordered Heterogeneous Materials as a Stochastic Process*. (Submitted) arXiv:1408.5303 (cond-mat.stat.mech).
- B. Giordano, Y. Visell, H.-Y. Yao, V. Hayward, J. Cooperstock, S. McAdams, *Identification Of Walked-Upon Materials In Auditory, Kinesthetic, Haptic And Audio-Haptic Conditions*. J Acoustical Society of America 131 (5), 2012.
- Y. Visell, *Frictional stick-slip oscillation as a first passage problem*. EPL Europhysics Letters 95 (6), 2011.
- Y. Visell, B. Giordano, G. Millet, J. Cooperstock, *Vibration Influences Haptic Perception of Surface Compliance During Walking*. PLoS ONE 6 (3), March, 2011.
- G. Lemaitre, O. Houix, P. Susini, Y. Visell, K. Franinovic, *Feelings elicited by auditory feedback from a computationally augmented artifact*. IEEE Transactions on Affective Computing, 2012.
- Y. Visell, A. Law, J. Cooperstock, *Touch is Everywhere: Floor Surfaces as Ambient Haptic Interfaces*. IEEE Transactions on Haptics, 2 (3), July-September, 2009. (Issue Cover Image)
- Y. Visell, F. Fontana, B. Giordano, R. Nohrdahl, S. Serafin, R. Bresin, *Sound Design and Perception in Walking Interactions*. Int J Human Computer Interaction Studies, 67 (11), Elsevier, 2009.
- Y. Visell, *Tactile Sensory Substitution: Models for Enaction in HCI*. Interacting with Computers, 21 (1-2), Elsevier, 2009.
- G. Lemaitre, O. Hioux, Y. Visell, K. Franinovic, N. Misdariis, P. Susini, *Toward the Design and Evaluation of Continuous Sound in Tangible Interfaces*. Int J Human Computer Interaction Studies, 67 (11), Elsevier, 2009.
- Y. Visell, *Spontaneous Organization, Pattern Models, and Music*. Organised Sound 9(2), Cambridge Univ. Press, 2004.

## Peer Reviewed Conference Publications (Selected)

- Y. Shao, Y. Visell, *Learning Constituent Parts of Touch Stimuli from Whole Hand Vibrations*. Proc. IEEE Haptics Symposium, 2016. **Best Paper Award**, Runner Up.
- M. Chartier, N. Thomas, Y. Shao, Y. Visell, *Toward a Wearable Tactile Sensory Amplification Device: Transfer Characteristics and Optimization*. Proc. IEEE Haptics Symposium, 2016. **Best Paper Award**, Work-in-Progress Category.

- R. Lerch, H. Cui, S. Patwardhan, Y. Visell, C. Sims, Exploring Haptic Working Memory as a Capacity Limited Channel. Proc. IEEE Haptics Symposium, 2016. **Best Paper Award**, Finalist.
- B. Li, Y. Visell, Design, Analysis, and Fabrication Methods for Highly Compliant Tactile Sensing Arrays. Proc. IEEE Haptics Symposium, Work-in-Progress, 2016.
- H. Cui and Y. Visell, Linear and Nonlinear Subspace Analysis of Hand Movements During Grasping. Proc. of IEEE Engineering and Biology Conference (EMBC), 2014.
- H. Nagano, Y. Visell, S. Okamoto, On the Effect of Vibration on Slip Perception During Bare Finger Contact. Proc. of Eurohaptics Conference, 2014.
- M. Janko, R. Primerano, Y. Visell, Scale dependence of force patterns during the scanning of a surface by a bare finger. Proc. of Eurohaptics Conference, 2014. **Best Paper Award**, Finalist (Rank 4 of 200+)
- Y. Visell, K. Duraikkannan, V. Hayward, A Device and Method for Multimodal Haptic Rendering of Volumetric Stiffness. Proc. of Eurohaptics Conference, 2014.
- J. Kahn, D. Peretz, J. Tangorra, Y. Visell, Touch Sensing in a Robotic Fish Fin. Living Machines: Intl Conf on Biomimetic and Biohybrid Systems, 2013.
- Y. Visell, V. Hayward, An asymmetry in force perception contingent on motion reversal. Proc. of the IEEE World Haptics Conference, 2013.
- A. Berrezag, Y. Visell, V. Hayward, Compressibility and Crushability Reproduction Through an Amorphous Haptic Interface. Proceedings of the Eurohaptics Symposium, 2012.
- Y. Visell, J. Cooperstock, Design of a Vibrotactile Display via a Rigid Surface. Proceedings of the IEEE Haptics Symposium, 2010. **Best Paper Award**.
- Y. Visell, S. Smith, A. Law, R. Rajalingham, J. Cooperstock, Contact Sensing and Interaction Techniques for a Distributed, Multimodal Floor Display. Proceedings of the IEEE Symposium on 3D User Interfaces (3DUI'10), 2010.
- Y. Visell, A. Law, S. Smith, J. Ip, J. Cooperstock, Interaction Capture in Immersive Environments via an Intelligent Floor Surface. Proceedings of IEEE Virtual Reality (VR'10), 2010.
- R. Rajalingham, Y. Visell, J. Cooperstock, Probabilistic Tracking of Pedestrian Movements from In-floor Force Measurements. Proceedings of the 7th Canadian Conference on Computer and Robot Vision (CRV'10), 2010 (accepted).
- A. Law, J. Ip, B. Peck, Y. Visell, P. Kry, J. Cooperstock, A Multimodal Floor for Virtual Environments. ACM SIGGRAPH, Emerging Technologies, 2009.
- Y. Visell, A. Law, J. Cooperstock, Toward Iconic Vibrotactile Information Display via Floor Surfaces. Proceedings of World Haptics, 2009.
- A. Law, B. Peck, Y. Visell, P. Kry, J. Cooperstock, A Multi-modal Floor-space for Experiencing Material Deformation Underfoot in Virtual Reality. Proc. IEEE Intl. Workshop on Haptic Audio Visual Environments and Games (HAVE'08).
- Y. Visell, J. R. Cooperstock, K. Franinovic, B. L. Giordano, S. McAdams, K. Jathal, A. Law, F. Fontana, A Vibrotactile Device for Display of Virtual Ground Materials in Walking. Proceedings of Eurohaptics, 2008.
- B. L. Giordano, S. McAdams, Y. Visell, J. R. Cooperstock, H. Yao, V. Hayward, Non-Visual Identification of Walking Grounds. Proceedings of Acoustics'08. J. Acoust. Soc. Am. 123 (5):3412, 2008.
- R. Bresin, S. Della Monache, F. Fontana, S. Pappetti, P. Polotti, Y. Visell, Auditory Feedback from Crumpling Sound Synthesis. ACM CHI 2008 Extended Abstracts.
- Y. Visell and J. R. Cooperstock, Enabling Gestural Interaction by Means of Tracking Dynamical Systems Models and Assistive Feedback. Proceedings of the IEEE Intl. Conf. on Systems, Man, and Cybernetics (IEEE SMC'07), 2007.
- K. Franinovic, Y. Visell, New Musical Interfaces in Context: Sonic Interaction Design in the Urban Setting. Intl. Conf. on New Instruments for Musical Expression (NIME'07), 2007.
- Y. Visell, K. Franinovic, Recycled Soundscapes. ACM Designing Interactive Systems (DIS'04), 2004.

## Book Chapters

- Y. Visell, S. Okamoto, Vibrotactile Sensation and Softness Perception. Chapter in: Multisensory Softness, ed. Massimiliano di Luca. Springer Verlag Series on Touch and Haptic Systems, 2014.
- Y. Visell, R. Murray-Smith, S. Brewster, J. Williamson, Continuous Auditory and Tactile Interaction Design. Chapter in: Sonic Interaction Design, eds. K. Franinovic and S. Serafin. MIT Press, 2013.
- Y. Visell, F. Steinicke, J. Campos, A. Lecuyer, Introduction: Human Walking in Virtual Environments. Chapter in: F. Steinicke, Y. Visell, J. Campos, A. Lecuyer (eds.), Human Walking in Virtual Environments: Perception, Technology, and Applications. Springer Verlag Series in Engineering, 2013.
- Y. Visell, S. Smith, J. Cooperstock, Interaction with Computationally Augmented Floor Surfaces. Chapter in: F. Steinicke, Y. Visell, J. Campos, A. Lecuyer (eds.), Human Walking in Virtual Environments: Perception, Technology, and Applications. Springer Verlag Series in Engineering, 2013.
- M. Marchal, G. Cirio, Y. Visell, F. Fontana, S. Serafin, J. Cooperstock, A. Lecuyer, Multimodal Rendering. Chapter in: F. Steinicke, Y. Visell, J. Campos, A. Lecuyer (eds.), Human Walking in Virtual Environments: Perception, Technology, and Applications. Springer Verlag Series in Engineering, 2013.
- Y. Visell, S. Smith, J. Cooperstock, Distributed human-computer interaction with augmented floor surfaces. Chapter in: Walking with the Senses, eds. Y. Visell and F. Fontana. Logos Verlag, 2012.
- Y. Visell, R. Rajalingham, J. Cooperstock, A review of nonvisual signatures of human walking with applications to person tracking in augmented environments. Chapter in: Walking with the Senses, eds. Y. Visell and F. Fontana. Logos Verlag, 2012.
- G. Cirio, Y. Visell, and M. Marchal, Multisensory and Haptic Rendering of Complex Virtual Grounds. Chapter in: Walking with the Senses, eds. Y. Visell and F. Fontana. Logos Verlag, 2012.
- V. Hayward, Y. Visell, S. Serafin, F. Fontana, M. Civolani, Novel haptic displays for walking interactions. Chapter in: Walking with the Senses, eds. Y. Visell and F. Fontana. Logos Verlag, 2012.

## Patents

- B. Li, Y. Visell, Stretchable Tactile Sensing Array. (Drexel University), USPTO (Pending).
- Y. Visell, K. Franinovic, A. Law, J. Cooperstock (McGill University), Floor-Based Haptic Communication System. USPTO 9041521.

## Invited Presentations

- Jul 2016 IEEE Image, Video, and Multidimensional Signal Processing (IVMSP) Workshop, Bordeaux, France
- Apr 2016 IEEE Haptics Symposium, Transactions on Haptics Special Session, Philadelphia, PA
- Jun 2014 Eurohaptics Workshop on Multisensory Softness, Versailles, France
- Nov 2013 Psychonomic Society, Tactile Research Group Workshop
- Oct 2008 Design Symposium Pecha Kucha, Montreal
- Oct 2007 Design Symposium Pecha Kucha, Montreal, 2008

## Department Seminars

- Oct 2015 University of California, Santa Barbara, Mechanical Engineering Department
- Mar 2015 New York University, Department of Mechanical Engineering and Aerospace
- Mar 2015 University of California – Santa Barbara, Departments of Media Arts & Technology and Electrical and Computer Engineering
- Feb 2015 Princeton University, Department of Mechanical Engineering and Aerospace

Feb 2015 Ohio State University, Department of Mechanical Engineering  
Feb 2015 Temple University, Department of Electrical and Computer Engineering  
Feb 2015 University of Massachusetts – Amherst, School of Computer Science  
Feb 2015 Virginia Polytechnic Institute and State University (Virginia Tech), Mechanical Engineering Department  
Nov 2014 University of Pennsylvania, Institute for Research in Cognitive Sciences  
Oct 2014 University of Florida, Electrical and Computer Engineering Department  
Oct 2013 Drexel University, School of Biomedical Engineering  
Apr 2012 Ecole des Beaux Arts de Strasbourg  
Dec 2010 NTT Research Laboratories, Atsugi, Japan  
Jul 2009 University of Verona, Department of Computer Science  
Mar 2008 McGill University, CIRMMT Workshop on Multimodal Integration  
Mar 2008 McGill University, REPARTI Network Workshop  
Nov 2008 McGill University, Workshop on Multimodal Influences on Perceived Self Motion  
Jun 2007 University of Zurich, AI Laboratory  
Jul 2007 Ecole Polytechnique Federale de Lausanne (EPFL), BIRG Laboratory

## Funding

### Current Funding Awards

#### Google Faculty Research Award

VTouch: Virtual sensations of direct touch from focused cutaneous vibrations, 2015-2016

University of California, Santa Barbara

Budget: \$65,000

Role: Principal Investigator (Sole PI)

Submitted: 2015-10-15

#### NSF CISE - Information & Intelligent Systems - Cyber Human Systems

CHS: E-TOUCH: Electronically Amplifying the Sense of Touch, 2015-2018

University of California, Santa Barbara

Budget: \$500,000

Role: Principal Investigator (Sole PI)

Submitted: 2015-01-14

#### NSF Cyber Physical Systems

CPS: Breakthrough: From Whole-Hand Tactile Imaging to Interactive Simulation (ID 1446752), 2015-2017

University of California, Santa Barbara

Budget: \$500,000

Role: Principal Investigator (Sole PI)

Submitted: 2014-06-02

#### Independence Blue Cross, Medical Simulation Grant

Wearable Soft Electronic Sensing for Palpation Simulation, Assessment, and Documentation, 2015

Drexel University

Budget: \$50,000

Role: Principal Investigator, with D. Scott Lind, M.D. (PI)

Submitted: 2014-09-04

### Proposals Under Review

### Past Funding Awards

#### EU FP7 ICT-FET Cognitive Robotics Initiative, 2013-2017

WEARHAP: Distributed robotic interfaces for wearable haptic interaction

UPMC Univ. Paris 06, U. Sienna (IT), U. Pisa (IT), TU Munich, 6 others

Budget: 7M Euro (Local budget: 500K Euro)

Role: Coauthored proposal, Local project coordinator

Submitted: 2012

#### EU FP7 ICT-FET project NIW: Natural Interactive Walking (no. 222107), 2008-2011

Additional funding from Quebec Ministry of Economic Development (Separate grant)

Partners: McGill Univ. (CA), INRIA-IRISA (FR), UPMC Paris 6 (FR), Aalborg Univ. (DK), Univ. Verona (IT)

Budget: 1.8M Euro

Role: Conceived project, Lead author of proposal, Coordinated research (McGill Univ.)

Submitted: 2007

#### EU ESF/COST Action (no. IC0601), 2007-2011

SID: Sonic Interaction Design

Budget: 1.6M Euro

Partners: 25 countries represented (approx.)

Role: Coauthored proposal, Management committee member, National delegate (Canada)

Submitted: 2006

#### EU FP6 NEST Pathfinder (no. 029085), 2006-2009

CLOSED: Closing the Loop of Sound Evaluation and Design

Partners: Zurich Univ. of the Arts (CH), IRCAM (FR), TU Berlin (DE), Univ. Verona (IT)

Budget: 1.5M Euro

Role: Conceived project, Lead author of proposal, Research, coordination, financial admin. (Zurich)

Submitted: 2005

## **Letters of Intent, Accepted**

### **Intuitive Surgical, Technology Grant**

Wearable Soft Electronic Sensing for Palpation: Assessment, Documentation, and Diagnosis, 2015

Drexel University

Budget: \$50,000

Role: Principal Investigator, with D. Scott Lind, M.D. (Co-PI)

Submitted: 2014-06-01

## Professional Experience

9/2015–Present	<b>Assistant Professor</b>	<b>Univ. of California, Santa Barbara</b> Media Arts and Technology Program Dept. of Electrical and Computer Engineering Dept. of Mechanical Engineering (Affiliate)
1/2013–6/2015	<b>Assistant Professor</b>	<b>Drexel University</b> Dept. of Electrical and Computer Engineering Dept. of Biomedical Engineering (Affiliate)
2011–2012	<b>Postdoctoral Researcher</b>	<b>Université Pierre et Marie Curie -- Paris 6</b> Inst. Intelligent Systems and Robotics (ISIR) Prof. V. Hayward, PI
2006–2011	<b>Research Fellow</b>	<b>Zurich University of the Arts</b> Interaction Design Program Dept. of Design and ICS
2005-2010	<b>Graduate Researcher</b>	<b>McGill University</b> Dept. of Electrical and Computer Engineering Center for Intelligent Machines & CIRMMT Prof. J. Cooperstock, PI
2006	<b>Faculty Lecturer</b>	<b>McGill University</b> Dept. of Electrical and Computer Engineering
2006 – 2009	<b>Visiting Professor</b>	<b>Nuova Accademia di Belli Arti</b> Department of Design
2005 - 2006	<b>Adjunct Professor</b>	<b>Concordia University, Montreal</b> Intermedia and Cyberarts Program Department of Studio Arts
2004	<b>Founder and Co-Director</b>	<b>Zero-Th Association</b> ( <a href="http://www.zero-th.org">http://www.zero-th.org</a> ) Interaction design and arts practice
2004	<b>Visiting Researcher</b>	<b>Interaction Design Institute Ivrea (IDII), Italy</b>
2001 – 2003	<b>Principal DSP Engineer, Audio</b>	<b>Ableton</b> ( <a href="http://www.ableton.com">http://www.ableton.com</a> ) Award-Winning Music Software Berlin, Germany
1999 – 2001	<b>Research Scientist, Speech recognition</b>	<b>Loquendo Inc.</b> Now: <b>Nuance Inc.</b> (by aquisition) Formerly: <b>Vocal Point Inc.</b> (by aquisition) San Francisco, USA
1999	<b>Graduate Researcher, Sonar</b>	<b>Applied Research Laboratories</b> Sonar Development Division Austin, TX
1997 – 1999	<b>Graduate Researcher</b>	<b>University of Texas-Austin</b> Center for Particle Physics Prof. Yuval Ne'eman, PI
Summer 1995	<b>Summer Research</b>	<b>University of Texas-Austin</b> Center for Relativity
Summer 1994	<b>Engineering technician, Robotics</b>	<b>Hine Design (now Lam Research)</b> Redwood City, CA



## Awards

Google Faculty Award, 2016.

Best Paper, IEEE Haptics Symposium 2010. Ranked 1st from more than 100 submissions.

Finalist for Best Paper, EuroHaptics 2014. Ranked 4th from more than 200 submissions.

Nominated for EuroHaptics Society best PhD thesis award, 2011.

Multiple industry awards for Ableton Live music software, including: Keys magazine, Macworld, Keyboard magazine, Future music, MacAddict, Mac Life, Remix, Computer Music, Electronic Musician, DJ Tech, PC World, and MusicTech. The software is used by many notable artists, including several Grammy and Oscar award winning musicians, composers, and producers.

Intel Corporation Galileo 2 Development Board Grant for Education (\$1200)

NSERC Industrial graduate fellowship, Electronic Arts 2009 (declined for administrative reasons).

Entrance fellowship (competitive) Dept. of Electrical and Computer Engineering, McGill University.

Student research award Center for Interdisciplinary Research in Music, Media, and Technology, McGill Univ., 2006.

Student research award Center for Interdisciplinary Research in Music, Media, and Technology, McGill Univ., 2007.

Graduate research support Department of Electrical and Computer Engineering, McGill Univ. (J. Cooperstock).

Graduate research support Department of Psychology, McGill Univ. (D. Levitin).

Graduate fellowship (3 years), Department of Physics, The University of Texas at Austin.

1st Place, Hughes Corporation High School Physics Competition.

Top 5% placement in the American High-School Invitational Mathematics Examination (AHSME), qualifying for the American High-School Invitational Mathematics Examination (AIME).

National Merit Scholarship finalist.

National French language examination competition, 3rd place in Arizona, Top 10 in Southwest USA.

Mathcounts, Junior high school mathematics team contest, State champion team member (Arizona).

## Professional Service

**Lead Guest Editor** IEEE Transactions on Haptics, Special Issue on Active Touch Sensing (announced).

**Organizing committee** & local arrangements chair for IEEE Haptics Symposium 2016, the primary haptics conference in the USA.

**Organizer** of the IEEE/RSJ IROS 2014 Workshop on Active Touch Sensing in Robots and Animals

**Organizer** ACM CHI 2013 Course on Walking in VR

**NSF Reviewer**, Division of Information & Intelligent Systems

## Journal Reviewing

PLoS one

IEEE Transactions on Robotics

International Journal of Robotics Research (IJRR)

IEEE Transactions on Haptics

IEEE Transactions on Mechatronics

IEEE Transactions on Systems, Man, and Cybernetics

IEEE Transactions on Human-Machine Systems

Behavioral Brain Research

Journal of Experimental Psychology

Acta Psychologica, Elsevier

Displays

International Journal of Human-Computer Interaction Studies, Elsevier

Assistive Technology (Journal), Taylor & Francis

## Conference Committees

Organizing Committee, IEEE Haptics Symposium, 2016

Editorial Committee, IEEE World Haptics Conference, 2015

Awards Committee, EuroHaptics, 2014

Conference Editorial Board, IEEE World Haptics Conference, 2015 (IEEE WHC)

Program Committee, IEEE Virtual Reality Conference, 2015 (IEEE VR)

Program Committee, Sound and Music Computing Conference, 2011 (SMC)

Program Committee, ACM International Conference on Multimodal Interfaces, 2007 (ICMI)

## Conference Reviewing

ACM Conference on Human Factors in Computing Systems (ACM CHI)

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

IEEE Haptics Symposium

EuroHaptics

IEEE World Haptics Conference

IEEE International Symposium on Robots and Human Interactive Communication (Ro-Man)

ACM Conference on Multimodal User Interfaces (ACM IMUI)

IEEE International Symposium on 3D User Interfaces (3DUI)

International Symposium on Haptic and Audio Interaction Design (HAID)

International Computer Music Conference (ICMC)

Laval Virtual - International Conference on Virtual Reality (VRIC)

International Conference on Auditory Display (ICAD)

Sound and Music Computing Conference (SMC)

## Organization of Courses and Workshops

2014 IEEE/RSJ IROS Workshop on Active Touch Sensing in Humans and Robots, Chicago, USA

2013 ACM CHI Course on Interactive Walking in VR, Paris, France

2012 Hands-on Haptics, point Atelier, La Gaité Lyrique, Paris

2012 Workshop on haptics and movement, Ecole des Beaux Arts, Strasbourg

2010 Interactive Sonification Workshop, Deutsch Telekom Labs, Berlin

2009 Interactive sound, OBORO Center for the Arts, Montreal, Canada

2009 CIRMMT Workshop on Multimodal Interaction, Montreal

2008 ACM CHI Workshop on Sonic Interaction Design, Firenze

2008 Workshop on Tangible Auditory Interfaces, Oboro Centre, Montreal

2006 Tangible and auditory interaction design, Advanced Sound (II) Course, Concordia University

2006 Tangible human-computer interaction and Ubiquitous computing, HCI Course, McGill University

2004 X-Med-K Workshops (experimental media art), FoAM vzw, Brussels

## Teaching

- denotes a course that was newly designed and taught
- ◇ denotes significant revisions to material of a course that was taught

Drexel University, Department of Electrical and Computer Engineering

ECE 490/690: **Haptic Engineering** (Spring 2013 ●, Spring 2015)

ECES 511: **Fundamentals of Systems I** (Fall 2013 ◇, Fall 2014)

ECES 512: **Fundamentals of Systems II** (Winter 2013-4 ◇, Winter 2014-5)

ECES 513: **Fundamentals of Systems III** (Spring 2014 ◇, Spring 2015)

McGill University, Electrical and Computer Engineering Department

ECSE 526: **Artificial Intelligence** (Spring 2006 ◇)

Nuova Accademia di Belle Arti Milano, Design Department

**Interaction Design** (Spring 2009 ●)

University of the Arts (ZHdK) Zurich, Interaction Design Program

**Interaction Design** (Summer 2006)

Concordia University, Montreal, Intermedia and Cyberarts Program

IMCA 221: **Interactive Programming for Artists** (Fall 2005 ◇)

The University of Texas-Austin, Department of Physics

PHY101L: **Laboratory for Mechanics** (Instructor)

## Mentoring

**Advisor** to two PhD students in the Department of Electrical and Computer Engineering at Drexel University:

Bin Li

Thesis Title: Soft tactile sensing for medical palpation.

Expected graduation in 2016

Marco Janko

Thesis Title: Recovering surface microgeometry through active touch.

Expected graduation in 2017

**Advisor** to two PhD students in the Department of Electrical and Computer Engineering at Drexel University:

Yitian Shao

Thesis Title: Mechanical waves accompanying whole hand haptic interaction.

Expected graduation in 2018

Zachary Wells

Thesis Title: TBD.

Expected graduation in 2020

**Advisor** to three Master's degree student in the ECE Department at Drexel University:

Zhengqiao Zhao

Project Title: Time-resolved frictional forces felt by the finger when sliding on a textured surface

Graduated in 2016

Ye Shi

Project Title: Instrumentation for soft tactile sensors, with biomedical applications  
Graduated in 2016

Keerthi Duraikkannen

Project Title: Simulating softness with force-contingent vibrations  
Graduated in 2014

**Advisor** to two interdisciplinary senior engineering design teams at Drexel University, 2014-2015.

**Advisor** to one visiting PhD student in the ECE Department at Drexel University:

Hikaru Nagano (Nagoya Univ.)

Project Title: Vibration signatures of incipient slip in bare finger contact, 2014

**Advisor** to one undergraduate summer research coop student in the ECE Department at Drexel University:

Bengisu Ozbay

Project Title: The perceptual space of hand movements  
Summer 2014

**Current supervisor and mentor** to six additional graduate and undergraduate student researchers, and more than a dozen former graduate and undergraduate students.

## University Service, PhD Committees

Roger Luo, University of California, Santa Barbara, Media Arts and Technology (Advised by Prof. G. Legrady)

Jeffrey Kahn Jr., Drexel University, Mechanical Engineering and Mechanics (Advised by Prof. J. Tangorra)

Heather Culbertson, University of Pennsylvania, Mechanical Engineering (Advised by Prof. K. Kuchenbecker)

Brandon Morton, Drexel University, Electrical and Computer Engineering (Advised by Prof. Y. Kim)

Alyssa Batula, Drexel University, Electrical and Computer Engineering (Advised by Prof. Y. Kim)

Jeff Gregorio, Drexel University, Electrical and Computer Engineering (Advised by Prof. Y. Kim)

Jeff Scott, Drexel University, Electrical and Computer Engineering (Advised by Prof. Y. Kim)

Michael Caro, Drexel University, Electrical and Computer Engineering (Advised by Prof. Y. Kim)

Matthew Prockup, Drexel University, Electrical and Computer Engineering (Advised by Prof. Y. Kim)

David Grunwald, Drexel University, Electrical and Computer Engineering (Advised by Prof. Y. Kim)

Jared Coyle, Drexel University, Electrical and Computer Engineering (Advised by Prof. A. Fontecchio)

Zhihuan Wang, Drexel University, Electrical and Computer Engineering (Advised by Prof. B. Nabet)

## University Service, MS Committees

Owen Campbell, University of California, Santa Barbara, Media Arts and Technology (Advised by Prof. Curtis Roads)

## University Service, General

2015-6 Faculty Senate Representative, Media Arts and Technology, University of California, Santa Barbara

2015-6 Admissions Committee, Media Arts and Technology, University of California, Santa Barbara

2014-5 Award Committee, Antoinette Westphal College of Media, Westphal Creativity Fund, Drexel University

2014-5 Senior Design Committee, ECE Department, Drexel University

2013-5 Systems Area Curricular Group, ECE Department, Drexel University

2014-5 Assessment and Accreditation Committee, ECE Department, Drexel University  
 2014 Programming Education Subcommittee, ECE Department, Drexel University  
 2013 Nomination and Recognition Subcommittee, ECE Department, Drexel University  
 2013-4 Weekend Open House (Several Times), ECE Department, Drexel University  
 2013-4 Accepted Students Day (Several Times), ECE Department, Drexel University

## Exhibitions

2012 Fondation Claude Verlan – Musée de la Main, Lausanne, Switzerland  
 2010 SIGGRAPH Emerging Technologies, New Orleans  
 2009 International Design Biennale, St Etienne, France  
 2005 Phaeno Science Center, Wolfsburg, Germany  
 2004 Ircam/Centre Pompidou, Paris, France  
 2004 Happy New Ears festival, Kortrijk, Belgium  
 2004 Next 5 Minutes festival, Amsterdam, Netherlands  
 2003 FoAM, Brussels, Belgium  
 2002 Hippodrome Circus, Great Yarmouth, UK  
 2001 Ars Electronica, Linz, Austria

## Performances, Screenings, and Outreach

2015 Gene Frankel Theater, New York, “Slumbering Helplessly”, with Irene Moon, in “Secrets of the Insect World”  
 2014 Philadelphia Science Festival  
 2014 International Noise Conference (with Irene Moon), Miami  
 2013 Silent Barn (with Irene Moon), Brooklyn, New York  
 2012 Noise Festival (with Irene Moon), Red Light Room, Brooklyn, New York  
 2014 Best of Nerd Night (with Irene Moon), New York  
 2000 Deluxe Improvisation Festival, Tokyo, Japan (featuring Otomo Yoshihide, Gene Coleman, Toshimaru Nakamura, Yuji Takahashi, Ko Ishikawa, Tetsu Saitoh, Kazuko Takada, Brett Lerner, Portable Orchestra, and others)

## Interactive Art, Architecture, and Design, Selected

2006 Skyhooks, Urban-scale interactive flying sound installation, Happy New Ears, Kortrijk, BE  
 2005 Lyta, Body scale interactive shape display, Phaeno Science Center, Wolfsburg, DE  
 2004 Recycled Soundscapes, Sculptural Sound Instruments for Public Space, Centre Pompidou, FR  
 2004 Sonic Texting, with M. Rinott, Eyes-free mobile text messaging device, Salone del Mobile, Milano IT  
 2003 Synoptic Space, Interactive Environment (with liquid floor), Brussels, with FoAM BE  
 2003 Txoom, Interactive Playspace, Hippodrome Circus, UK, with FoAM BE  
 2001 TGarden, Interactive Environment, Ars Electronica, with FoAM BE

## Discography

2014 Three Men in a Tub, as Moth Magnet (with Irene Moon), in: The Thirteenth Letter, WFMU Records

2004 Hmmm, in: Organized Sound Annual, CD Compilation, Cambridge Univ. Press

2001 Untitled, Deluxe Improvisation Festival, Deluxe Records

1996 Public Safety (LP), with Brett Lerner, Public Safety Records

## Professional Consulting

3M Corporation (Robotics)

L-3 Communications (Smart Displays)

Philadelphia Opera (Stage Robotics)

## Press, Selected

ACM TechNews - A sensitive subject [28.03.2016]

Techxplore - Team catalogs patterns of vibration on the skin of the hand [28.03.2016]

Futurity - Touch sends vibrations far beyond our fingertips [30.03.2016]

Neuroscience News - Sensitive To The Touch [28.03.2016]

New Scientist - Magnetic bricks beam 3D objects into your screen - [31.03.2013]

Technology Review (MIT) – The Year in Enhancing Reality [28.12.2010]

New Scientist – Nokia touchscreen creates texture illusion [28.10.2010]

New Scientist – Putting the touch into touchscreens [26.04.2010]

New Scientist – Touch floors could be next step in computer interfaces [13.04.2010]

Technology Review (MIT) – Augmented-Reality Floor Tiling [28.04.2010]

Fast Company – Augmented Reality Floor Simulates Walking [29.04.2010]

Boing Boing – Augmented reality feedback flooring [29.04.2010]

Wired Magazine Online – Augmented Reality: Haptic flooring [29.04.2010]

Communications of the ACM – Augmented-Reality Floor Tiling [29.04.2010]

Future Digital Life – 10 Cool Things Going On Right Now in Augmented Reality [05.2010]

Golem.de – Ein Touchscreen fuer die Fuesse [29.04.2010]

Associated Press [08.2009] (NY Times, Minn. Star Trib, San Diego Trib, ...)

KTIRIO (Architecture) [09.2010]

ISPR Presence News [30.04.2010], Corriere della Sera (IT) [17.05.2010]

Toronto Sun [29.04.2010], News of the Weird [30.04.2010]

FloorCrunch.com [30.04.2010], Magyar Nemzet (Hungarian) [02.05.2010], NeoTeo.es [03.05.2010], Others ...

## Musical Training

Acoustic Guitar Performance, Stephanie Khoury, Montreal, Canada

Electronic Music Composition, Alvin Lucier, Wesleyan University

Computer Music Composition, Ron Kuivila, Wesleyan University

Jazz Performance (Bass), Roy Wiseman, Wesleyan University

Youth Orchestra (Cello), Tucson Junior Strings (Grade 7-12)

Youth Orchestra (Cello), Puyallup Public Schools (Grade 4-6)

## Synergistic Activities

On-air programmer, KCSB FM Santa Barbara, and online

Director for experimental music and on-air DJ at WESU radio, Middletown, CT

Programming and Software Development: C/C++, Java, Matlab, Mathematica, Maple, Perl, Max/MSP, Supercollider, MCU/DSP

Electronic music, Computer music, Guitar, Digital and analog sound synthesis, Video processing, Physical computing

Electronic and Computer Engineering, Mechatronics, Digital and analog electronics and control design, CAD, Rapid prototyping, Interaction design methods

## Personal Detail

Citizenship: USA

Language Skills: English (native), French (fluent), Serbo-Croatian (intermediate), German (basic-intermediate), Italian (basic).