

# HONG Z. TAN

Curriculum Vitae  
(updated on September 11, 2016)

## PROFESSIONAL PREPARATIONS

<i>Degree</i>	<i>Date</i>	<i>School</i>
B.S. BME (minor: CS)	July 1986	Shanghai Jiao Tong University Shanghai, P. R. China
S.M. EECS	May 1988	Massachusetts Institute of Technology, Cambridge, Massachusetts, USA
Ph.D. EECS	June 1996	Massachusetts Institute of Technology, Cambridge, Massachusetts, USA

*Ph.D. Thesis:*

“Information Transmission with a Multi-Finger Tactual Display,”  
Nathaniel I. Durlach, *advisor*.

## PROFESSIONAL EMPLOYMENT

June 1988 – June 1991 & Sept. 1993 – Feb. 1996	Research Assistant, Research Lab of Electronics, Massachusetts Institute of Technology, Cambridge, MA, USA
July 1991 – Aug. 1993	Research Associate, Department of Rehabilitation Medicine, Tufts University School of Medicine, Boston, MA, USA
Mar. 1996 – Aug. 1996	Postdoctoral Associate, Research Lab of Electronics, Massachusetts Institute of Technology, Cambridge, MA, USA
Sept. 1996 – July 1998	Research Scientist, Media Lab, Massachusetts Institute of Technology, Cambridge, MA, USA
Aug. 1998 – July 2003	Assistant Professor, School of Electrical and Computer Engineering, Purdue University,

West Lafayette, IN, USA

Jan. 2002 – July 2003      Assistant Professor (courtesy),  
School of Mechanical Engineering,  
Purdue University,  
West Lafayette, IN, USA

Aug. 2003 – July 2012      Associate Professor,  
School of Electrical and Computer Engineering,  
Purdue University,  
West Lafayette, IN, USA

Aug. 2003 – July 2012      Associate Professor (courtesy),  
School of Mechanical Engineering,  
Purdue University,  
West Lafayette, IN, USA

May 2004 – June 2004      McDonnell Visiting Fellow of Cognitive  
Neuroscience, Oxford University, U.K.

Aug. 2004 – July 2005      (On sabbatical leave from Purdue University)  
Visiting Associate Professor,  
Department of Computer Science,  
Stanford University,  
Palo Alto, CA, USA

Sept. 2006 – July 2012      Associate Professor (courtesy),  
Department of Psychological Sciences,  
Purdue University,  
West Lafayette, IN, USA

Jan. 2007 – Dec. 2008      Faculty Fellow of Haptics Research,  
Envision Center for Data Perceptualization,  
Purdue University,  
West Lafayette, IN, USA

Apr. 2008 – Mar. 2011      Guest Researcher (客座研究员),  
Institute of Life Science and Technology,  
Shanghai Jiao Tong University  
(上海交通大学生命科学技术学院),  
Shanghai, P.R. China

July 2011 – May 2012      (On sabbatical leave from Purdue University)  
Visiting Researcher,  
Human Computer Interaction Group,  
Microsoft Research Asia,  
Beijing, P.R. China

Aug. 2011 – present      Professor of Electrical and Computer Engineering,  
Professor (courtesy) of Mechanical Engineering,  
Professor (courtesy) of Psychological Sciences,  
Purdue University,  
West Lafayette, IN, USA

June 2012 – Aug. 2015      (On research leave from Purdue University)  
Senior Researcher and Research Manager,  
Human Computer Interaction Group,  
Microsoft Research Asia,  
Beijing, P.R. China

### **Consulting Activities**

Jan. 1993 – June 1993      EXOS Inc., Woburn, MA  
(later acquired by Microsoft Research)

### **HONORS AND AWARDS**

#### **External Awards and Recognition**

- [1] National Science Foundation **CAREER Award** (2000 – 2004)
- [2] **McDonnell Visiting Fellow** of Cognitive Neuroscience, Oxford University, U.K. (2004)
- [3] **Visiting Associate Professor** of Computer Science, Stanford University, Palo Alto, CA (2004 – 2005)
- [4] Chinese National Natural Science Funds for **Distinguished (Overseas) Young Scholar** (2005 – 2007)
- [5] **Senior Member** of IEEE (2006 – present)
- [6] **Best Paper Award** of the *World Haptics Conference 2007* for the paper: Dan Morris, Hong Z. Tan, Federico Barbagli, Timothy Chang, and Kenneth Salisbury, “Haptic feedback enhances force skill learning,” *Proceedings of the 2007 IEEE World Haptics Conference (WHC07): The Second Joint EuroHaptics Conference and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, Tsukuba, Japan, Mar. 22-24, 2007.
- [7] **Guest Researcher** of Life Science and Technology, Shanghai Jiao Tong University, Shanghai, P.R. China (2008 – 2011)

- [8] **Member of the Advisory Board**, *Center for Human Factors in Advanced Aeronautics Technologies* (a NASA Group 5 University Research Center), California State University, Long Beach, CA, USA (2010 – 2014)
- [9] **Best Poster Award** of the *World Haptics Conference 2011* for the paper: Jaeyoung Park, Andrew J. Doxon, William R. Provancher, David E. Johnson, and Hong Z. Tan, “Edge sharpness perception with force and contact location information,” *Proceedings of the IEEE World Haptics Conference 2011*, Istanbul, Turkey, June 21-24, 2011.
- [10] **Meritorious Service Award**, presented by *IEEE Transactions on Haptics* “In Grateful Recognition of Exemplary Service as Associate Editor for IEEE Transactions on Haptics,” March 2012.
- [11] **Member of the Management Committee**, *IEEE Transactions on Haptics*, representing the Technical Committee on Haptics, co-sponsored by the IEEE Computer Society and Robotics & Automation Society, 2014-2015.
- [12] **Member of the Honorary Advisory Council**, International Chinese Association of Computer Human Interaction (ICACHI), 2016.  
世界华人华侨人机交互协会名誉顾问 (2016 年)

### **Internal Awards and Recognition**

- [1] Purdue University Teaching for Tomorrow Award (2002)
- [2] Assistant Professor of Mechanical Engineering, Courtesy Appointment in the School of Mechanical Engineering, Purdue University, West Lafayette, IN (2002 – 2003)
- [3] Associate Professor of Mechanical Engineering, Courtesy Appointment in the School of Mechanical Engineering, Purdue University, West Lafayette, IN (2003 – 2012)
- [4] Professor of Mechanical Engineering, Courtesy Appointment in the School of Mechanical Engineering, Purdue University, West Lafayette, IN (2012 – present)
- [5] Associate Professor of Quantitative Psychology, Courtesy Appointment in the Department of Psychological Sciences, Purdue University, West Lafayette, IN (2006 – 2012)
- [6] Professor of Quantitative Psychology, Courtesy Appointment in the Department of Psychological Sciences, Purdue University, West Lafayette, IN (2012 – present)

- [7] Faculty Fellow of Haptics Research, Envision Center for Data Perceptualization, Purdue University, West Lafayette, IN (2007 – 2008)

### **EDITORIAL POSITIONS**

- [1] Associate Editor, *Presence: Teleoperators & Virtual Environments*, published by the MIT Press (2006 – 2012)
- [2] Associate Editor, *ACM Transactions on Applied Perception*, published by the Association for Computing Machinery (ACM) (2007 – 2012)
- [3] Associate Editor, *IEEE Transactions on Haptics*, jointly published by the IEEE Computer Society, Robotics & Automation Society and Consumer Electronics Society (2007 – 2012; 2016 – present)
- [4] Editor-in-Chief, *World Haptics Conference Editorial Board* (2012 – 2015)
- [5] Member, *IEEE Haptics Symposium Work-in-Progress Editorial Board* (2016)

### **Keynote and Plenary Presentations**

- [1] **Plenary** address, “The Role of Psychophysics in Haptics Research: An Engineer's Perspective,” *EuroHaptics 2006*, Paris, France, July 3-6, 2006. (One of two plenary talks. 247 registered participants. EuroHaptics is the main haptics research conference in Europe.)
- [2] **Keynote** address, “Haptic Displays for Wearable Applications: History, Opportunities and Challenges,” *First International Workshop on Haptic and Audio Interaction Design*, Glasgow, Scotland, Aug. 31-Sept. 1, 2006. (One of two plenary keynote addresses.)
- [3] **Keynote** address, “Human Sensory-Motor Performance as Guidelines for Interfacing Humans and Robots,” *Second International Workshop on Human-Centered Robotic Systems 2006 (HCRS'06)*, Munich, Germany, Oct. 6-7, 2006. (One of four plenary keynote addresses.)
- [4] **Keynote** address, “All About Thresholds: An Overview of Haptic Perception of Mechanical Properties,” *4th International Conference on Enactive Interfaces (ENACTIVE/07)*, Grenoble, France, Nov. 19-24, 2007. (One of three plenary talks.)

- [5] **Plenary** address, “Haptics Makes Virtual Reality Touchable (触觉反馈使虚拟现实伸手可及),” *The 5th Annual Conference of Virtual Reality Technology in China* (第5届中国2008VR国际峰会), Beijing, P.R. China, May 16, 2008. (This was the only plenary of the conference. Participants included VR researchers, corporate R&Ds and government policy makers. Approximately 200 audience in attendance.)
- [6] **Plenary** address, “Haptic Human-Machine Interfaces: History, Opportunities and Challenges,” *IEEE International Conference on Information and Automation*, Harbin, P. R. China, June 21, 2010. (One of three plenary talks. Approximately 450 registrants.)
- [7] **Plenary** talk, “Touch and Haptics,” *Microsoft Research Asia FY12 Kickoff*, Zhangjiajie, Hunan Province, P.R. China, September 15, 2011. (Participants included about 220 full-time researchers of Microsoft Research Asia. The talk was an overview of the state-of-the-art in haptics research, with the aim to spark interests to incorporate haptics into human-computer interaction.)
- [8] **Research Overview Talk**, “Haptics and its Application in Multimodal User Interfaces,” *2012 IEEE International Conference on Multimedia & Expo*, Melbourne, Australia, July 10, 2012. (This is a new type of “plenary talk” aimed at introducing an emerging new field, in this case haptics, to the participants of the conference.)
- [9] **Keynote** address, “Human Computer Interaction Research at Microsoft Research Asia,” *Microsoft Research Asia Faculty Summit 2012*, jointly organized by Microsoft Research Asia and Nankai and Tianjin Universities, Tianjin Auditorium, Tianjin, P. R. China, October 26, 2012.
- [10] **Keynote** address, “Fingertip Haptics and its Application in Touch-based Consumer Products,” *The 9th Joint Conference on Harmonious Human Machine Environment (HHME2013)*, Nanchang, P. R. China, September 27, 2013. (Organized by the ACM SIGCHI Chinese chapter and multiple committees of the Chinese Computing Federation, this is a joint conference of the *National Conference on Multimedia Technology 2013*, *Chinese HCI 2013* and *Pervasive Computing Conference 2013*.)
- [11] **Keynote** address, “Fingertip Haptics and its Application in Touch-based Consumer Products,” *Microsoft Hong Kong Day*, Hong Kong University of Science & Technology, Hong Kong, November 19, 2013.
- [12] **Keynote** address, “Fingertip Haptics and its Application in Keyclick Feedback for Typing on Flat Keyboards,” *HCI Korea 2014*, Kangwong Do, Republic of Korea, February 14, 2014.

(This is one of the biggest Korean domestic conferences, with 1,900 attendees who specialize in engineering, computer science, psychology, design and art.)

- [13] Invited Speaker (**Plenary**), “Haptic Feedback Technology R&D at Microsoft Research Asia,” Symposium on Intelligent Interactions, Tsinghua University, May 6, 2014.  
(Organized by the Chinese Academy of Science and Technology, this is a gathering of Chinese academic and industrial leaders to define emerging human computer interaction research themes that are of strategic importance to China.)
- [14] Invited Speaker (**Plenary**), “Wearables are Meant to be Touched and Felt,” *Wearable Technology UX Conference*, London, UK, September 22, 2014.  
(This is a non-academic conference organized by Smithers Apex in UK, where both the speakers and the attendees are by invitation only. It was dedicated to a discussion on the future of wearables.)
- [15] Guest Speaker (**Plenary**), “Haptic Keyclick Feedback on Flat Keyboard – Prototypes and User Studies,” *Workshop on “Haptics in Empowerment Informatics,”* in conjunction with *Asia Haptics 2014*, Tsukuba, Japan, November 18-20, 2014.
- [16] Invited Speaker (Plenary), “Touch and Feel through Wearables,” 第二届北师大心理学院用户体验 UX@BNU 高端论坛, Beijing Normal University, Beijing, P. R. China, August 28, 2016.

## **PUBLICATIONS**

### **Peer-Reviewed Serial Journal Articles**

- [J1] Hong Z. Tan, William M. Rabinowitz, and Nathaniel I. Durlach, “Analysis of a synthetic Tadoma system as a multidimensional tactile display,” *Journal of the Acoustical Society of America*, Vol. 86, No. 3, pp. 981–988, 1989.
- [J2] Nathaniel I. Durlach, Hong Z. Tan, Neil A. Macmillan, William M. Rabinowitz, and Louis D. Braida, “Resolution in one dimension with random variations in background dimensions,” *Perception & Psychophysics*, Vol. 46, No. 3, pp. 293–296, 1989.
- [J3] Xiao-Dong Pang, Hong Z. Tan, and Nathaniel I. Durlach, “Manual discrimination of force using active finger motion,” *Perception & Psychophysics*, Vol. 49, No. 6, pp. 531–540, 1991.

- [J4] Hong Z. Tan, Nathaniel I. Durlach, G. Lee Beauregard, and Mandayam A. Srinivasan, "Manual discrimination of compliance using active pinch grasp: The roles of force and work cues," *Perception & Psychophysics*, Vol. 57, No. 4, pp. 495–510, 1995.
- [J5] Hong Z. Tan, Nathaniel I. Durlach, William M. Rabinowitz, Charlotte M. Reed, and Jonathan R. Santos, "Reception of Morse code through motional, vibrotactile and auditory stimulation," *Perception & Psychophysics*, Vol. 59, No. 7, pp. 1004–1017, 1997.
- [J6] Hong Z. Tan, Nathaniel I. Durlach, William M. Rabinowitz, and Charlotte M. Reed, "Information transmission with a multi-finger tactual display," *Scandinavian Audiology*, Vol. 26, Suppl. 47, pp. 24–28, 1997. (**Invited reprint** of conference paper CC12 as a short summary article for European readers. A full length journal article appears as J8.)
- [J7] Hong Z. Tan and Alex Pentland, "Tactual displays for wearable computing," *Personal Technologies* (renamed *Personal and Ubiquitous Computing* since 2001), Vol. 1, pp. 225–230, 1997. (Invited reprint of conference paper #17.)
- [J8] Hong Z. Tan, Nathaniel I. Durlach, Charlotte M. Reed, and William M. Rabinowitz, "Information transmission with a multifinger tactual display," *Perception & Psychophysics*, Vol. 61, No. 6, pp. 993–1008, 1999.
- [J9] Hong Z. Tan, Lynne A. Slivovsky, and Alex Pentland, "A sensing chair using pressure distribution sensors," *IEEE/ASME Transactions on Mechatronics (special focus section on Haptic Devices and Applications)*, Vol. 6, No. 3, pp. 261–268, 2001.
- [J10] Rob Gray and Hong Z. Tan, "Dynamic and predictive links between touch and vision," *Experimental Brain Research*, Vol. 145, pp. 50–55, 2002.
- [J11] Hong Z. Tan, Rob Gray, J. Jay Young, and Ryan Traylor, "A haptic back display for attentional and directional cueing," *Haptics-e: The Electronic Journal of Haptics Research*, Vol. 3, No. 1, June 11, 2003. (<http://www.haptics-e.org/>)
- [J12] Hong Z. Tan, Charlotte M. Reed, Lorraine A. Delhorne, Nathaniel I. Durlach, and Natasha Wan, "Temporal masking of multidimensional tactual stimuli," *Journal of the Acoustical Society of America*, Vol. 114, No. 6, pp. 3295–3308, 2003.
- [J13] Seungmoon Choi and Hong Z. Tan, "Toward realistic rendering of haptic textures," *IEEE Computer Graphics and Applications* (Special Issue:



*Haptic Rendering – Beyond Visual Computing*), pp. 40–47, March/April 2004. (One of 5 articles selected from over 30 submissions to the Special Issue.)

- [J14] Seungmoon Choi and Hong Z. Tan, “Perceived instability of virtual haptic texture. I. Experimental studies,” *Presence: Teleoperators & Virtual Environments*, Vol. 13, No. 4, pp. 395–415, 2004.
- [J15] Seungmoon Choi, Laron A. Walker, Hong Z. Tan, Scott Crittenden, and Ron Reifenberger, “Force constancy and its role on haptic perception of virtual surfaces,” *ACM Transactions on Applied Perception*, Vol. 2, No. 2, pp. 89-105, 2005.
- [J16] Seungmoon Choi and Hong Z. Tan, “Perceived instability of virtual haptic texture. II. Effect of collision detection algorithm,” *Presence: Teleoperators & Virtual Environments*, Vol. 14, No. 4, pp. 463-481, 2005.
- [J17] Cristy Ho, Hong Z. Tan, and Charles Spence, “Using spatial vibrotactile cues to direct visual attention in driving scenes,” *Transportation Research Part F: Traffic Psychology and Behavior*, Vol. 8, pp. 397-412, 2005.
- [J18] Alberto Gallace, Hong Z. Tan, and Charles Spence, “Numerosity judgments for tactile stimuli distributed over the body surface,” *Perception*, Vol. 35, pp. 247-266, 2006.
- [J19] Hong Z. Tan, Federico Barbagli, Ken Salisbury, Cristy Ho, and Charles Spence, “Force-direction discrimination is not influenced by reference force direction (Short Paper),” *Haptics-e: The Electronic Journal of Haptics Research*, Vol. 4, No. 1, 3-Feb-2006.
- [J20] Alberto Gallace, Malika Auvray, Hong Z. Tan, and Charles Spence, “When visual transients impair tactile change detection: A novel case of crossmodal change blindness?” *Neuroscience Letters*, Vol. 398, pp. 280-285, 2006.
- [J21] Cristy Ho, Hong Z. Tan, and Charles Spence, “The differential effect of vibrotactile and auditory cues on visual spatial attention,” *Ergonomics*, Vol. 49, No. 7, pp. 724-738, 2006.
- [J22] Alberto Gallace, Hong Z. Tan, and Charles Spence, “The failure to detect tactile change: A tactile analogue of visual change blindness,” *Psychonomic Bulletin & Review*, Vol. 13, No. 2, pp. 300-303, 2006.
- [J23] Federico Barbagli, Kenneth Salisbury, Cristy Ho, Charles Spence, and Hong Z. Tan, “Haptic discrimination of force direction and the influence

of visual information,” *ACM Transactions on Applied Perception*, Vol. 3, No. 2, pp. 125-135, 2006.

- [J24] Ali Israr, Hong Z. Tan, and Charlotte M. Reed, “Frequency and amplitude discrimination along the kinesthetic-cutaneous continuum in the presence of masking stimuli,” *Journal of the Acoustical Society of America*, Vol. 120, No. 5, pp. 2789-2800, 2006.
- [J25] Seungmoon Choi and Hong Z. Tan, “Perceived instability of virtual haptic texture. III. Effect of update rate,” *Presence: Teleoperators & Virtual Environments*, Vol. 16, No. 3, pp. 263-278, 2007.
- [J26] Domenico Prattichizzo, Mauro Barni, Gloria Menegaz, Alessandro Formaglio, Hong Z. Tan, and Seungmoon Choi, “Perceptual issues in haptic digital watermarking,” *IEEE MultiMedia*, Vol. 14, No. 3, pp. 84-91, 2007.
- [J27] Hong Z. Tan, Mandayam A. Srinivasan, Charlotte M. Reed, and Nathaniel I. Durlach, “Discrimination and identification of finger joint-angle positions using active motion,” *ACM Transactions on Applied Perception*, Vol. 4, No. 2, Article 10, 14 pp., 2007.
- [J28] Hong Z. Tan, “Haptic interfaces for virtual environments: Perceptual instability and force constancy in haptic sensing of virtual surfaces,” *Canadian Journal of Experimental Psychology: Special Issue on New Directions in Touch*, Vol. 61, No. 3, pp. 265-275, 2007. **(Invited paper)**
- [J29] Alberto Gallace, Hong Z. Tan, and Charles Spence, “Do ‘mudsplashes’ induce tactile change blindness?,” *Perception & Psychophysics*, Vol. 69, No. 4, pp. 477-486, 2007.
- [J30] Alberto Gallace, Hong Z. Tan, and Charles Spence, “Multisensory numerosity judgments for visual and tactile stimuli,” *Perception & Psychophysics*, Vol. 69, No. 4, pp. 487-501, 2007.
- [J31] Malika Auvray, Alberto Gallace, Hong Z. Tan, and Charles Spence, “Crossmodal change blindness between vision and touch,” *Acta Psychologica*, Vol. 126, pp. 79-97, 2007.
- [J32] Alberto Gallace, Hong Z. Tan, and Charles Spence, “The body surface as a communication system: The state of the art after 50 years,” *Presence: Teleoperators & Virtual Environments*, Vol. 16, No. 6, pp. 655-676, 2007.
- [J33] CHENG Zhuo, WANG Hai-sheng, MIN You-jiang, YAN Zhen-guo, Hong Z. Tan, and ZHUANG Tian-ge, “Preliminary study on force feedback of acupuncture in virtual reality based on the Visible Human,” *Chinese*

*Journal of Medical Instrumentation*, Vol. 31, No. 1, pp. 5-9, 2007.  
(Written in Chinese with an English abstract.)

程卓, 王海生, 闽友江, 严振国, 张虹, 庄天戈, “数字人体的针灸力感虚拟现实初步研究,” *中国医疗器械杂志*, 2007年31卷第1期, 5-9页.

- [J34] Alberto Gallace, Hong Z. Tan, Patrick Haggard, and Charles Spence, “Short term memory for tactile stimuli,” *Brain Research*, Vol. 1190, pp. 132-142, 2008.
- [J35] Chanon Jones, Rob Gray, Charles Spence, and Hong Z. Tan, “Directing visual attention with spatially informative and spatially noninformative tactile cues,” *Experimental Brain Research*, Vol. 186, pp. 659-669, 2008.
- [J36] Alberto Gallace, Hong Z. Tan, and Charles Spence, “Can tactile stimuli be subitized? An unresolved controversy within the literature on numerosity judgments,” *Perception*, Vol. 37, pp. 782-800, 2008.
- [J37] Malika Auvray, Alberto Gallace, Jess Hartcher-O’Brien, Hong Z. Tan, and Charles Spence, “Tactile and visual distractors induce change blindness for tactile stimuli presented on the fingertips,” *Brain Research*, Vol. 1213, pp.111-119, 2008.
- [J38] Hong Z. Tan, Shuo Yang, Zygmunt Pizlo, Pietro Buttolo, and Matthew Johnston, “Manual Detection of Spatial and Temporal Torque Variation through a Rotary Switch,” *IEEE Transactions on Haptics*, Vol. 1, No. 2, pp. 96-107, 2008.
- [J39] Ali Israr, Peter H. Meckl, Charlotte M. Reed, and Hong Z. Tan, “Controller design and consonantal contrast coding using a multi-finger tactual display,” *Journal of the Acoustical Society of America*, Vol. 125, No. 6, pp. 3925-3935, June 2009.
- [J40] Rob Gray, Rayka Mohebbi, and Hong Z. Tan, “The spatial resolution of crossmodal attention: Implications for the design of multimodal interfaces,” *ACM Transactions on Applied Perception*, Vol. 6, No. 1, Article 4 (February 2009), 14 pages.
- [J41] Rayka Mohebbi, Rob Gray, and Hong Z. Tan, “Driver reaction time to tactile and auditory read-end collision warnings while talking on a cell phone,” *Human Factors: The Journal of the Human Factors and Ergonomics Society*, Vol. 51, No. 1, pp. 102-110, 2009.
- [J42] Stacie M. Straughn, Rob Gray, and Hong Z. Tan, “To go or not to go: Stimulus-response compatibility for tactile and auditory pedestrian collision warnings,” *IEEE Transactions on Haptics*, Vol. 2, No. 2, pp. 111-117, 2009.

- [J43] Georgiana Juravle, Heiner Deubel, Hong Z. Tan, and Charles Spence, "Changes in tactile sensitivity over the time-course of a goal-directed movement," *Behavioural Brain Research*, Vol. 208, pp. 391-401, 2010.
- [J44] Steven A. Cholewiak, Kwangtaek Kim, Hong Z. Tan, and Bernard D. Adelstein, "A frequency-domain analysis of haptic gratings," *IEEE Transactions on Haptics*, Vol. 3, No. 1, pp. 3-14, 2010.
- [J45] Hong Z. Tan, Charlotte M. Reed, and Nathaniel I. Durlach, "Optimum information-transfer rates for communication through haptic and other sensory modalities," *IEEE Transactions on Haptics*, Vol. 3, No. 2, pp. 98-108, 2010.
- [J46] Kwangtaek Kim, Mauro Barni, and Hong Z. Tan, "Roughness-adaptive 3D watermarking based on masking effect of surface roughness," *IEEE Transactions on Information Forensics and Security*, Vol. 5, No. 4, pp. 721-733, 2010.
- [J47] Jörg Trojan, Annette M. Stolle, Antonija Mršić Carl, Dieter Kleinböhl, Hong Z. Tan, and Rupert Hölzl, "Spatiotemporal integration in somatosensory perception: Effects of sensory saltation on pointing at perceived positions on the body surface," *Frontiers in Psychology*, Vol. 1, No. 206, <http://www.frontiersin.org> (doi:10.3389/fpsyg.2010.00206)
- [J48] Neil Forrest, Sarah Baillie, Patrick Kalita, and Hong Z. Tan, "A comparative study of haptic stiffness identification by veterinarians and students," *IEEE Transactions on Haptics*, Vol. 4, No. 2, pp. 78-87, 2011.
- [J49] Curt Salisbury, R. Brent Gillespie, Hong Z. Tan, Federico Barbagli, and J. Kenneth Salisbury, "What you can't feel won't hurt you: Evaluating haptic hardware using a haptic sensitivity contrast function," *IEEE Transactions on Haptics*, Vol. 4, No. 2, pp. 134-146, 2011.
- [J50] Hsiang-Yu Chen, Jaeyoung Park, Steve Dai, and Hong Z. Tan, "Design and evaluation of identifiable key-click signals for mobile devices," *IEEE Transactions on Haptics*, Vol. 4, No. 4, pp. 229-241, 2011.
- [J51] Roslizawaty Mohd Rosli, Hong Z. Tan, Robert W. Proctor, and Rob Gray, "Attentional gradient for crossmodal proximal-distal tactile cueing of visual spatial attention," *ACM Transactions on Applied Perception*, Vol. 8, No. 4, Article 23, 12 pp, 2011.
- [J52] Andrew J. Doxon, David E. Johnson, Hong Z. Tan, and William R. Provancher, "Force and contact location shading methods for use within two and three-dimensional polygonal environments," *Presence: Teleoperators and Virtual Environments*, Vol. 20, No. 6, pp. 505-528, 2011.

- [J53] Kwangtaek Kim, Mauro Barni, Domenico Prattichizzo, and Hong Z. Tan, "Visuohaptic discrimination of 3D gross shape," *Seeing and Perceiving*, Vol. 25, pp. 351-364, 2012.
- [J54] Jaeyoung Park, Andrew J. Doxon, William R. Provancher, David E. Johnson and Hong Z. Tan, "Haptic edge sharpness perception with a contact location display," *IEEE Transactions on Haptics*, Vol. 5, No. 4, pp. 323-331, 2012.
- [J55] Matthew B. Kocsis, Steven A. Cholewiak, Ryan M. Traylor, Bernard D. Adelstein, E. Daniel Hirleman, and Hong Z. Tan, "Discrimination of real and virtual surfaces with sinusoidal and triangular gratings using the fingertip and stylus," *IEEE Transactions on Haptics*, Vol. 6, No. 2, pp. 181-192, 2013. (DOI: 10.1109/TOH.2012.31).
- [J56] Rob Gray, Charles Spence, Cristy Ho, and Hong Z. Tan, "Efficient multimodal cuing of spatial attention," *Proceedings of the IEEE*, Vol. 101, pp. 2113-2122. (DOI: 10.1109/JPROC.2012.2225811)
- [J57] Lynette Jones and Hong Z. Tan, "Application of Psychophysical Techniques to Haptic Research," *IEEE Transactions on Haptics*, Vol. 6, No. 3, pp. 268-284, 2013. (DOI: 10.1109/TOH.2012.74)
- [J58] Andrew Doxon, David Johnson, Hong Z. Tan, and William Provancher, "Human detection and discrimination of tactile repeatability, mechanical backlash, and temporal delay in a combined tactile-kinesthetic haptic display system," *IEEE Transactions on Haptics*, Vol. 6, No. 4, pp. 453-463, 2013. (DOI: 10.1109/TOH.2013.50)
- [J59] M. Gail Jones, Gina Childers, Brandon Emig, Joel Chevrier, Hong Tan, Vanessa Stevens, and Jonathan List, "The efficacy of haptic simulations to teach students with visual impairments about temperature and pressure," *Journal of Visual Impairment & Blindness*, Vol. 108, No. 1, pp. 55-61, January-February 2014.
- [J60] Kibum Kim, Xiangshi Ren, Seungmoon Choi, and Hong Z Tan, "Assisting people with visual impairments in aiming at a target on a large wall-mounted display," *International Journal of Human-Computer Studies*, Vol. 86, pp. 109-120, 2016.

### **Publications Pending**

- [Pend1] Alejandra J. Magana, Karla L. Sanchez, Alejandro Guayaquil, Uzma A. Shaikh, M. Gail Jones, and Hong Z. Tan, "Visuohaptic simulations for conceptual understanding in electricity and magnetism," submitted to *Computers & Education*.

- [Pend2] M. Gail Jones, Gina M. Childers, Brandon Emig, Joel Chevrier, Vanessa Stevens, and Hong Z. Tan, “The efficacy of visuohaptic simulations in teaching concepts of heat, pressure and random motion,” submitted to *Computers & Education*.

### **Research Book Contributions (and Books Published)**

- [B1] Hong Z. Tan and Alex Pentland, “Tactual Displays for Sensory Substitution and Wearable Computers,” Chapter 18 in *Fundamentals of Wearable Computers and Augmented Reality*, Woodrow Barfield and Thomas Caudell (Eds.), Mahwah, NJ: Lawrence Erlbaum Associates, 2001, pp. 579–598.
- [B2] Hong Z. Tan, Alex Pentland and Lynne A. Slivovsky, “Sensing Chair and Floor Using Distributed Contact Sensors,” Chapter 3.4 in *Sensors in Intelligent Buildings*, O. Gassmann and H. Meixner (Eds.), Weinheim, Germany: WILEY-VCH Verlag GmbH, 2001, pp. 293–304.
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- [C54] Jaeyoung Park, Kwangtaek Kim, Hong Z. Tan, Ron Reifenger, Gary Bertoline, Tallulah Hoberman, and Deborah Bennett, "An initial study of visuohaptic simulation of point-charge interactions," *Proceedings of Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, Waltham, MA, pp. 425-430, March 25-26, 2010.
- [C55] Jaeyoung Park, Andrew J. Doxon, William R. Provancher, David E. Johnson, and Hong Z. Tan, "Edge sharpness perception with force and contact location information," *Proceedings of the IEEE World Haptics Conference 2011*, Istanbul, Turkey, pp. 517-522, June 21-24, 2011. **(Winner of Best Poster Award)**
- [C56] J. Jay Young, Carolyn Stolfi, Hong Z. Tan, Joël Chevrier, Brien Dick, and Gary Bertoline, "Learning force concepts using visual trajectory and haptic force information at the elementary school level," *Proceedings of the IEEE World Haptics Conference 2011*, Istanbul, Turkey, pp. 391-396, June 21-24, 2011.
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- [C63] Jin Ryong Kim and Hong Z. Tan, "A study of touch typing performance with keyclick feedback," *Proceedings of the Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, Houston, Texas, pp. 227-233, February 23-26, 2014.
- [C64] Jin Ryong Kim and Hong Z. Tan, "Haptic feedback intensity affects touch typing performance on a flat keyboard," *Proceedings of EuroHaptics 2014*, Versailles, Paris, France, 8 pp., June 24-27, 2014.
- [C65] Byung-Kil Han, Kwangtaek Kim, Koji Yatani and Hong Z. Tan, "Text entry performance evaluation of haptic soft QWERTY keyboard on a tablet device," *Proceedings of EuroHaptics 2014*, Versailles, Paris, France, 8 pp., June 24-27, 2014.
- [C66] Bahador Saket, Sijie Yang, Hong Tan, Koji Yatani and Darren Edge, "TalkZones: Section-based time support for presentations," *MobileHCI'14: Proceedings of the 16th International Conference on Human-Computer Interaction with Mobile Devices & Services*, Toronto, ON, Canada, 10pp., September 23-26, 2014.  
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### Invited Conference Papers

- [CI1] Hong Z. Tan, Robert Gray, Charles Spence, Chanon M. Jones, and Roslizawaty Mohd Rosli, "The haptic cuing of visual spatial attention: Evidence of a spotlight effect," (**invited paper** for special session on Haptics), *Proceedings of SPIE-IS&T Electronic Imaging, Human Vision and Electronic Imaging XIV*, B. E. Rogowitz & T. N. Pappas (Eds.), SPIE Vol. 7240-72400I, San Jose, CA, 12 pp., Jan. 18-22, 2009.

### Refereed Abstracts and Posters & Non-Refereed Conference Papers

- [CC1] Hong Z. Tan, Robert R. Ebert, David M. Horowitz, and Corine A. Bickley, "A comprehensive speech recognition service delivery model illustrated with case studies," *Proceedings of the Seventh Annual Conference on Technology and Persons with Disabilities*, Los Angeles, CA, pp. 535-539, 1992.
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- [CC3] Corine Bickley, Christopher S. Jones, Janet Wang, Hong Z. Tan, Robert Ebert, and David M. Horowitz, "Case study of voice control of AutoCAD," *Proceedings of ECART2*, The Swedish Handicap Institute, Stockholm, Sweden, pp. 7.3, 1992.
- [CC4] Corine Bickley, Hong Tan, and David Horowitz, "Voice input for graphics and text creation: A case study," *Proceedings of the Eighth Annual Conference on Technology and Persons with Disabilities*, Los Angeles, CA, pp. 32-36, 1993.
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- [CC6] David V. Pynadath, Hong Z. Tan, and David M. Horowitz, "A study of the information capacity of human eye movement for augmentative communication," *Proceedings of the Rehabilitation Engineering Society of North America*, Las Vegas, NV, pp. 96-98, 1993.



- [CC7] Hong Z. Tan, "Preliminary Design Specifications for Haptic Interfaces," presented at the *Image Special Interest Group Symposia: Perception and Human Factors*, June 22–24, Tucson, AZ, 1993. (Oral presentation only.)
- [CC8] Showna Chang, Hong Z. Tan, Brian Eberman, and Beth Marcus, "Sensing, perception, and feedback for VR," *Proceedings of the Virtual Reality Systems Fall 1993 Conference*, New York, NY, 5 pp., Oct. 18–21, 1993.
- [CC9] Gerald L. Beauregard, William M. Rabinowitz, Hong Z. Tan, and Nathaniel I. Durlach, "Amplitude and frequency resolution for motional stimulation." *Proceedings of the Third International Conference on Tactile Aids, Hearing Aids, and Cochlear Implants*, Miami, FL, p. 20, May 2–5, 1994. (Abstract only.)
- [CC10] Hong Z. Tan and Nathaniel I. Durlach, "A study of the tactual perception of motor input sequences." *Proceedings of the Third International Conference on Tactile Aids, Hearing Aids, and Cochlear Implants*, Miami, FL, p. 23, May 2–5, 1994. (Abstract only.)
- [CC11] Hong Z. Tan, Nathaniel I. Durlach, William M. Rabinowitz, and Charlotte M. Reed, "Tactual performance with motional stimulation of the index finger," *Journal of the Acoustical Society of America*, Vol. 95, No. 5, Pt. 2, pp. 2986–2987, 1994. (Abstract only.)
- [CC12] Hong Z. Tan, Nathaniel I. Durlach, William M. Rabinowitz, and Charlotte M. Reed, "Information transmission with a multi-finger tactual display," *Proceedings of International Sensory Aid Conference*, Sint-Michielsgestel, The Netherlands, p. 15, May 28–31, 1996. (Appears also as journal article J6.)
- [CC13] Hong Z. Tan and William M. Rabinowitz, "A new multi-finger tactual display," *Journal of the Acoustical Society of America*, Vol. 99, No. 4, Pt. 2, p. 2477, 1996. (Abstract only.)
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- [CC15] Hong Z. Tan, Ifung Lu, and Alex Pentland, "The chair as a novel haptic user interface," *Proceedings of the Workshop on Perceptual User Interfaces*, Banff, Alberta, Canada, pp. 56–57, Oct. 19–21, 1997.
- [CC16] Hong Z. Tan, Natasha F. Wan, and Charlotte M. Reed, "Masking and temporal integration with a multi-finger tactual display." *Proceedings of*

*the International Sensory Aids Conference*, Portland, ME, pp. 45–46, May 11–13, 1998.

- [[CC17](#)] Seungmoon Choi and Hong Z. Tan, “A parameter space for perceptually stable haptic texture rendering,” *Proceedings of the Fifth PHANToM Users Group Workshop (PUG2000)*, J. K. Salisbury and M. A. Srinivasan (Eds.), Aspen, CO, 4 pp., Oct. 28–30, 2000.
- [[CC18](#)] Robert Gray and Hong Z. Tan, “Dynamic spatial mapping between vision and touch,” *Abstracts of the Psychonomic Society*, Vol. 5, pp. 38, 2000. (Abstract only.)
- [[CC19](#)] Hong Z. Tan, David S. Ebert, XiaoDong Li, Lynne A. Slivovsky, Nikolai Svakhine, and John Leimgruber III, “sensingChair,” *SIGGRAPH 2001 Conference Abstracts and Applications*, p. 135, Los Angeles, CA, Aug. 12–17, 2001. (Invited conference publication for the *sensingChair* project – one of 23 juried interactive exhibitions showcasing the most promising technological inventions. Our installation was open to 40,000 attendees of SIGGRAPH 2001 for a total of 45 hours over 6 days.)
- [CC20] Charlotte M. Reed, Lorraine A. Delhorne, Andy Brughera, Nat Durlach, Hong Z. Tan and Amy Wong, “Information-transfer rates for sequences of multidimensional tactual signals,” presented at *The 7th International Sensory Aids Conference*, Portland, ME, May 8, 2003. (Abstract only.)
- [CC21] Rob Gray and Hong Tan, “Combination of visual and tactile information about moving objects,” presented at the *Fall Vision Meeting*, Tucson, AZ, 2003. (Abstract only.)
- [CC22] Antonija Mrsic, Rupert Hölzl, Dieter Kleinböhl, Annette M. Stolle, and Hong Z. Tan, “Sensory saltation on the abdomen,” *Proceedings of the 7th Tübingen Perception Conference (TWK 2004)*, H. H. Bülhoff, H. A. Mallot, R. D. Ulrich, and F. A. Wichmann (Eds.), Kirchentellinsfurt: Knirsch Verlag (ISBN 3-927091-68-5). Tübingen, Germany, p. 110, Jan. 30–Feb. 1, 2004. (Abstract only.)
- [CC23] Laron Walker, Hong Z. Tan, Sorubh Mahadoo, Stephen Brown, and Ron Reifenberger, “A scanning probe nanomanipulator,” *Proceedings of the Workshop on Scanning Probe Microscopy*, Purdue University, West Lafayette, IN, Feb. 9, 2004. (Abstract only.)
- [[CC24](#)] Federico Barbagli, Cristy Ho, Charles Spence, Hong Z. Tan, and Kenneth Salisbury, “Force-direction discrimination: Effect of the congruency of visual information,” peer reviewed extended abstract, presented at *The 2005 World Haptics Conference (WHC05): The First Joint EuroHaptics Conference and Symposium on Haptic Interfaces for*

*Virtual Environment and Teleoperator Systems*, Pisa, Italy, Mar. 18–20, 2005.

- [[CC25](#)] Enkhtuvshin Dorigotov, Seungmoon Choi, Laura Arns, Raj Arangarasan, Steven R. Dunlop, Gary R. Bertoline, and Hong Z. Tan, “Purdue portable haptic display for large immersive virtual environments,” peer reviewed extended abstract, presented at *The 2005 World Haptics Conference (WHC05): The First Joint EuroHaptics Conference and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, Pisa, Italy, Mar. 18–20, 2005.
- [[CC26](#)] Cristy Ho, Hong Z. Tan, and Charles Spence, “Investigating the crossmodal spatial cuing of driving attention,” poster presented at *The 6th Annual Meeting of the International Multisensory Research Forum (IMRF05)*, Rovereto, Italy, June 5–9, 2005.
- [[CC27](#)] Alberto Gallace, Hong Z. Tan, and Charles Spence, “Unimodal and bimodal numerosity judgments,” poster presented at *The 6th Annual Meeting of the International Multisensory Research Forum (IMRF05)*, Rovereto, Italy, June 5–9, 2005.
- [[CC28](#)] Robert W. Proctor, Hong Z. Tan, Kim-Phuong L. Vu, Rob Gray, and Charles Spence, “Implications of compatibility and cuing effects for multimodal interfaces,” *Proceedings of the 11th International Conference on Human-Computer Interaction (Vol. 11 - Foundations of Augmented Cognition)*, Mahwah, NJ: Lawrence Erlbaum Associates, Las Vegas, Nevada, 10 pp., July 22–27, 2005.
- [[CC29](#)] Cristy Ho, Charles Spence, and Hong Z. Tan, “Warning signals go multisensory,” *Proceedings of the 11th International Conference on Human-Computer Interaction (Vol. 9 - Advances in Virtual Environments Technology: Musings on Design, Evaluation, & Applications)*, Mahwah, NJ: Lawrence Erlbaum Associates, Las Vegas, Nevada, 10 pp., July 22–27, 2005.
- [[CC30](#)] Cristy Ho, Hong Z. Tan, and Charles Spence, “Capturing driver attention,” *Abstracts of the Psychonomic Society*, Vol. 10, p. 14, 2005. (Abstract only.)
- [[CC31](#)] Alberto Gallace, Hong Z. Tan, and Charles Spence, “Change blindness as a multisensory phenomenon: Evidence from tactile change detection,” *Abstracts of the Psychonomic Society*, Vol. 10, p. 89, 2005. (Abstract only.)
- [[CC32](#)] Charlotte M. Reed, Nathaniel I. Durlach, and Hong Z. Tan, “Optimizing information-transfer rates for human communication,” *Journal of the Acoustical Society of America*, Vol. 119, p. 3237, 2006. (Abstract only.)

- [[CC33](#)] Hong Z. Tan and Rob Gray, “The cross-modal spotlight of attention,” *Abstracts of the Psychonomic Society*, Vol. 11, p. 14, November 2006. (Abstract only.)
- [[CC34](#)] Chanon M. Jones, J. Jay Young, Rob Gray, Charles Spence, and Hong Z. Tan, “An eyetracker study of the haptic cuing of visual attention,” peer reviewed extended abstract, *Proceedings of the 2007 World Haptics Conference (WHC07): The Second Joint EuroHaptics Conference and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, Tsukuba, Japan, pp. 557–558, Mar. 22–24, 2007.
- [[CC35](#)] Christopher Sewell, Nikolas H. Blevins, Sumanth Peddamatham, Hong Z. Tan, Dan Morris, and Kenneth Salisbury, “The effect of virtual haptic training on real surgical drilling proficiency,” peer reviewed extended abstract, *Proceedings of the 2007 World Haptics Conference (WHC07): The Second Joint EuroHaptics Conference and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, Tsukuba, Japan, pp. 601–603, Mar. 22–24, 2007.
- [[CC36](#)] Alberto Gallace, Hong Z. Tan, Patrick Haggard, and Charles Spence, “Transient short term representations of tactile stimuli contain more information than can be reported explicitly: Evidence from the partial report paradigm,” poster presented at the *2007 Experimental Psychology Society Meeting*, Edinburgh, Scotland, PS2:31, July 4–7, 2007. (Abstract only.)
- [[CC37](#)] Alberto Gallace, Malika Auvray, Jessica Hartcher-O'Brien, Hong Z. Tan, and Charles Spence, “The effect of visual, auditory, and tactile distractors on people's awareness of tactile change,” presented at the *Body Representation Workshop*, Rovereto, Italy, Oct. 8–10, 2007. (Abstract only.)
- [[CC38](#)] Steven A. Cholewiak and Hong Z. Tan, “Haptic stiffness identification and information transfer,” *Abstracts of the Psychonomic Society*, Vol. 12, p. 83 (no.2101), 2007. (Abstract only.)
- [CC39] Gary Bertoline, Deborah Bennett, Ron Reifenberger, Hong Z Tan, Joël Chevrier, Annie Luciani, Jaeyoung Park, Kwangtaek Kim, Tallulah Hoberman, and Carolyn Stolfi, “NUE: Enhanced Undergraduate Nanotechnology Education with Haptic and Visualization Tools,” poster presented at the *2010 NSF Engineering Education Awardees Conference*, Reston, Virginia, Jan. 31 – Feb. 2, 2010.

## Demonstrations

- [D1] Zhaoyuan Ma, Yukang Yan, Darren Edge, Hong Tan, Yuanchun Shi, and Ed Colgate, “*eClover: A Combined Electrostatic and Four-Tactor Wearable System for Eyes-Free Interactions*,” *hands-on demo presented at IEEE World Haptics Conference (WHC 2015) – The 6th Joint Eurohaptics Conference and IEEE Haptics Symposium*, Evanston, Illinois, USA, June 22-26, 2015. (Abstract only)

## Refereed Interactive Exhibition

- [E1] Hong Z. Tan, David S. Ebert, XiaoDong Li, Lynne A. Slivovsky, Nikolai Svakhine, and John Leimgruber III, “sensingChair,” *Emerging Technologies, SIGGRAPH 2001*, Los Angeles, CA, Aug. 12–17, 2001. (One of 23 juried interactive exhibitions showcasing the most promising inventions, our installation was open to 38,000 attendees of SIGGRAPH 2001 for a total of 45 hours over 6 days.)
- [E2] Xiaowei Dai, Jiawei Gu, Xiang Cao, J. Ed Colgate, and Hong Z. Tan, “*SlickFeel: Sliding and clicking haptic feedback on a touchscreen*,” *The 25<sup>th</sup> ACM Symposium on User Interface Software and Technology (UIST 2012)*, Boston, Massachusetts, USA, October 8, 2012. (see [coverage](#) by MIT Tech Review)

## PATENTS ISSUED AND PENDING

- [P1] Tim Paek, Johnson Apacible, Bongshin Lee, Asela Gunawardana, Vishwas Kulkarni and Hong Z. Tan, “Provision of Haptic Feedback for Localization and Data Input,” US patent application# 13/787,832, filed on March 7, 2013, published on April 10, 2014.
- [P2] Timothy S. Paek, Hong Tan, Asela Gunawardana, and Mark Yeend, “Multi-Function Configurable Haptic Device,” international patent application# PCT/US13/63976, filed on October 9, 2013, published on April 17, 2014.
- [P3] Jiawei Gu, Siyuan Fang and Hong Z. Tan, “Feedback for Gestures,” US patent application# 13/893,554, filed on May 14, 2013, published on November 20, 2014.
- [P4] Hong Z. Tan, Zhaoyuan Ma and Chen Zhao, “Localized Key-Click Feedback,” international patent application# PCT/US14/37940, filed on May 14, 2014, published on November 20, 2014.
- [P5] Darren K. Edge and Hong Z. Tan, “Adaptive Timing Support for Presentations,” US patent application# 13/898,338, filed on May 20, 2013, published on November 20, 2014.

- [P6] Hong Z. Tan and Zhaoyuan Ma, “Passive Haptics as Reference for Active Haptics,” (pending).

## **PROFESSIONAL SOCIETY ACTIVITIES**

### **IEEE Technical Committee on Haptics** (<http://www.worldhaptics.org>)

Jointly-sponsored by the IEEE Computer Society and the IEEE Robotics & Automation Society

#### **Founding Chair**

October 2006 – March 31, 2008

Member

2006 – present

## **Professional and Honorary Society Memberships**

Institute of Electrical and Electronics Engineering (IEEE)

Member 1996 – 2006;

Senior Member 2006 – present

Psychonomic Society

Associate Member 1996 – 2003;

Member 2003 – present

Association for Computing Machinery (ACM)

Professional Member, 1999 – present

## **CONFERENCE ORGANIZATION ACTIVITIES**

### **Conference/Workshop Prof. Tan has (co-)organized**

- [1] *Organizer*, breakout session on “Haptic Perceptual User Interfaces,” *Second Workshop on Perceptual User Interfaces*, San Francisco, CA, Nov. 6, 1998.
- [2] *Organizer*, session on “Haptics,” The Eighth International Symposium on Robotics and Applications (ISORA 2000), part of The Fourth World Automation Congress (WAC 2000), Maui, Hawaii, June 15, 2000.
- [3] *Co-organizer* (with Blake Hannaford), International Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems, sponsored by the IEEE Computer Society, 2003–2005.  
*(This is the main technical conference on haptics research in North America.)*

- [4] *Co-organizer* (with Aleix M. Martinez), First Workshop on Computer Vision and Pattern Recognition for Human Computer Interaction, part of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR03), sponsored by the IEEE Computer Society, July 17, 2003.
- [5] *Publicity Co-Chair*, 17th IEEE International Symposium on Robot and Human Interactive Communication (IEEE RO-MAN'08), sponsored by the IEEE Robotics and Automation Society, Munich, Germany, August 1-3, 2008.
- [6] *Liaison Chair*, *Asia Haptics 2014*, Epochal Tsukuba, Japan, November 18-20, 2014.
- [7] *Co-Chair* (with Ed Colgate), *IEEE World Haptics Conference (WHC 2015) – The 6th Joint Eurohaptics Conference and IEEE Haptics Symposium*, Evanston, Illinois, June 22-25, 2015.
- [8] *Liaison Chair*, *Asia Haptics 2016*, Kashiwanoha Conference Center, Kashiwanoha, Japan, November 29 to December 1, 2016.

**Conference Committees Prof. Tan has served on**

- [1] Member, Program Committee, *International Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, sponsored by the American Society of Mechanical Engineers Dynamic Systems and Control Division (1992-2000), and by the IEEE Computer Society (2002-), 1999 to 2007.  
*(This is the main technical conference on haptics research in North America.)*
- [2] Member, Program Committee, Eighth IEEE International Symposium on Robotics and Applications (ISORA'00), June 11–16, 2000.  
*(Organized and chaired a session on haptics.)*
- [3] Member, Organizing Committee, HCI International 2001 – Ninth International Conference on Human-Computer Interaction, Aug. 5–10, 2001.
- [4] Member, Technical Program Committee, IEEE International Conference on Robotics and Automation (ICRA2002), May 11–15, 2002.
- [5] Member, Programme Committee, *EuroHaptics 2003*, Dublin, Ireland, July 6-9, 2003.  
*(This is the main technical conference on haptics research in Europe.)*

- [6] Member, International Program Committee, 2003 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2003), Oct. 27-31, 2003.
- [7] Member, Program Committee, Fifth International Conference on Multimodal Interfaces (ICMI-PUI'03), Nov. 5-7, 2003.
- [8] Member, Program Committee, *EuroHaptics 2004*, Munich, Germany, June 5-7, 2004.
- [9] Member, Steering Committee, World Haptics Conference 2005: First Joint EuroHaptics Conference and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems, Pisa, Italy, March 18-20, 2005.
- [10] Member, Programme Committee on Haptic Science, World Haptics Conference 2005: First Joint EuroHaptics Conference and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems, Pisa, Italy, March 18-20, 2005.
- [11] Member, International Program Committee, *EuroHaptics 2006*, Paris, France, July 3-6, 2006.  
*(This is the main technical conference on haptics research in Europe.)*
- [12] Member, Awards Committee, *EuroHaptics 2006*, Paris, France, July 3-6, 2006.
- [13] Member, Program Committee, *The 2006 Robotics: Science and Systems Conference (RSS-2006)*, Philadelphia, PA, Aug. 16-19, 2006.
- [14] Member, Program Committee, *First International Workshop on Haptic and Audio Interaction Design*, University of Glasgow, UK, Aug. 31 - Sept. 1, 2006.
- [15] Member, Steering Committee, World Haptics Conference 2007: Second Joint EuroHaptics Conference and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems, Tsukuba, Japan, March 22-24, 2007.
- [16] Member, Program Committee, Second International Workshop on Haptic and Audio Interaction Design, Seoul, Korea, Nov. 29-30, 2007.
- [17] Member, International Programme Committee, *EuroHaptics 2008*, Madrid, Spain, June 11-13, 2008.  
*(This is the main technical conference on haptics research in Europe.)*
- [18] Associate Editor for Human Haptics, Conference Editorial Board, *World Haptics Conference 2009*, Salt Lake City, Utah, March 18-20, 2009.



- [19] Member, Best Paper Award Committee, *World Haptics Conference 2009*, Salt Lake City, Utah, March 18-20, 2009.
- [20] Member, Program Committee, *IEEE International Conference on Information and Automation*, Harbin, Heilongjian Province, P.R. China, June 20-23, 2010.
- [21] Member, Best Paper Awards Committee, *IEEE International Conference on Information and Automation*, Harbin, Heilongjian Province, P. R. China, June 20-23, 2010.
- [22] **Associate Editor** for Haptic Science, Conference Editorial Board, *World Haptics Conference 2011*, Istanbul, Turkey, June 22-24, 2011.
- [23] **Chair**, Best Paper Awards Committee, *World Haptics Conference 2011*, Istanbul, Turkey, June 22-24, 2011.
- [24] **Chair**, Best Paper Awards Committee, *IEEE Haptics Symposium 2012*, Vancouver, British Columbia, Canada, March 4-7, 2012.
- [25] Member, Program Committee, *EuroHaptics Conference 2012*, Tampere, Finland, June 12-15, 2012.
- [26] **Associate Chair**, Papers & Notes Program Committee, *ACM Interactive Tabletops & Surfaces 2012*, Cambridge, Massachusetts, November 11-14, 2012.
- [27] **Editor-in-Chief**, World Haptics Conference 2013 Editorial Board, *IEEE World Haptics Conference (WHC 2013) – The 5th Joint Eurohaptics Conference and IEEE Haptics Symposium*, Daejeon, Korea, April 14-17, 2013.
- [28] Member, Advisory Committee, *EuroHaptics Conference 2014*, Versailles, France, June 24-27, 2014.
- [29] **Editor-in-Chief**, World Haptics Conference 2015 Editorial Board, *IEEE World Haptics Conference (WHC 2015) – The 6th Joint Eurohaptics Conference and IEEE Haptics Symposium*, Evanston, Illinois, June 22-25, 2015.
- [30] Member, Best Demonstration Awards Committee, *EuroHaptics 2016*, Imperial College London, United Kingdom, July 4-7, 2016.

## Conference Sessions Prof. Tan has (Co-)Chaired

- [1] Moderator, breakout session on “Haptic Perceptual User Interfaces,” *Second Workshop on Perceptual User Interfaces*, San Francisco, CA, Nov. 6, 1998.
- [2] Session Co-Chair (with Lynette Jones), “Human Factors,” *The Eighth Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, Nashville, TN, Nov. 14, 1999.
- [3] Session Chair, “Haptics,” The Eighth International Symposium on Robotics and Applications (ISORA 2000), part of The Fourth World Automation Congress (WAC 2000), Maui, Hawaii, June 15, 2000.
- [4] Session Co-Chair (with Lynette Jones), “Human Factors I,” The Ninth IEEE Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems, Orlando, FL, Nov. 9, 2000.
- [5] Session Chair, “Speech/Voice Interface,” The Ninth International Conference on Human-Computer Interaction (HCI International 2001), New Orleans, LA, Aug. 8, 2001.
- [6] Session Co-Chair (with Grigore Burdea), “III. Psychophysics and Human Factors,” *The Tenth IEEE Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, Orlando, FL, Mar. 24, 2002.
- [7] Session Co-Chair (with Vincent Hayward), “Haptic Perception,” *IEEE International Conference on Robotics and Automation (ICRA2002)*, Washington, DC, May 13, 2002.
- [8] Session Co-Chair (with John Hollerbach), “Symposium on Haptic Interfaces for Virtual Environments and Teleoperation — Device Evaluation and Performance,” *The Eleventh IEEE Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, Los Angeles, CA, Mar. 22, 2003.
- [9] Session Chair, “Hardware,” *EuroHaptics 2003*, Dublin, Ireland, July 7, 2003.
- [10] Session Co-Chair (with Roberta Klatzky), “Haptic Science I.,” World Haptics Conference 2005: the First Joint EuroHaptics Conference and the Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems, Pisa, Italy, March 18-20, 2005.

- [11] Session Co-Chair (with Rob Howe), “Session I. Psychophysics,” *The Fourteenth IEEE Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, Arlington, VA, Mar. 25, 2006.
- [12] Session Chair, “Psychophysics,” *First International Workshop on Haptic and Audio Interaction Design*, University of Glasgow, Glasgow, UK, Aug. 31, 2006.
- [13] Session Chair (invited), “Bionics/Human Machine Interface,” *Ninth Annual Kavli Chinese-American Frontiers of Science Symposium*, sponsored by the Chinese Academy of Sciences and the U.S. Academy of Sciences, Arnold and Mabel Beckman Center, Irvine, CA, Oct. 26-28, 2006.
- [14] Session Co-Chair (with Charles Spence), “Psychophysics IV,” World Haptics Conference (WHC07): Second Joint EuroHaptics Conference and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems, Tsukuba, Japan, March 22-24, 2007.
- [15] Session Chair, “Perception I,” IEEE Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems, Reno, NV, March 13, 2008.
- [16] Session Co-Chair (with Gianni Borghesan), “S2: Haptics Applications,” *EuroHaptics 2008*, Madrid, Spain, June 11, 2008.
- [17] Session Co-Chair, “Human Performance 3,” World Haptics Conference (WHC2009): Third Joint EuroHaptics and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems, Salt Lake City, UT, March 18-20, 2008.
- [18] Session Co-Chair, “(Applications) Haptics in Guidance,” *IEEE Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, Waltham, MA, March 25-26, 2010.
- [19] Session Chair (co-chair Martha Flanders), “Multisensory Perception,” *World Haptics Conference 2011*, Istanbul, Turkey, Friday, June 24, 2011.
- [20] Session Chair, “Opening Keynote,” *IEEE Haptics Symposium 2012*, Vancouver, British Columbia, Canada, March 4-7, 2012.
- [21] Session Chair (as Awards Chair), “Award Ceremony and Closing,” *IEEE Haptics Symposium 2012*, Vancouver, British Columbia, Canada, March 4-7, 2012.
- [22] Session Chair, “Tactile Display & Tactile Sensing,” *EuroHaptics 2012*, Tampere, Finland, June 12-15, 2012.

- [23] Session Co-Chair (with Mounia Ziat), “Human Motor Learning and Movement,” *Haptics Symposium 2014*, Houston, TX, February 25, 2014.
- [24] Session Chair, keynote by Aude Oliva, “Zooming through the Visual Brain in Time and Space,” *EuroHaptics Conference 2014*, Versailles, France, June 24-27, 2014.
- [25] Session Co-Chair (with Evren Samur), “Surface Interaction and Display,” *Haptics Symposium 2016*, Philadelphia, PA, April 10, 2016.

## **SEMINARS, TUTORIALS, WORKSHOPS, SHORT COURSES, ETC.**

### **Invited Seminars and Presentations**

#### ***at Purdue University***

- [1] “Haptic Human-Computer Interfaces,” ECE Graduate Seminar, Jan. 21, 1999.
- [2] “Haptic Human-Computer Interfaces,” Cognitive, Learning & Memory Colloquia, Department of Psychological Sciences, Sept. 8, 1999.
- [3] “Haptic Human-Computer Interfaces,” Human Factors and Ergonomics Society, School of Industrial Engineering and Department of Psychological Sciences, Sept. 16, 1999.
- [4] “Haptic Human-Machine Interfaces,” Basic Medical Sciences Seminar, School of Veterinary Medicine, Mar. 23, 2000.
- [5] “Haptic Human-Computer Interfaces,” Purdue Computer Science Freshman Honors Class (SIC490H), Apr. 19, 2000.
- [6] “Perception-Based Engineering,” presentation to Distinguished Engineering Alumni spouses, with Patricia Davies (ME), George Chiu (ME), and Aimee Surprenant (Psychological Sciences), Apr. 28, 2000.
- [7] “A Chair-based Haptic System,” guest lecturer, ME597I Product and Process Design (Prof. Karthik Ramani, ME), Mar. 27, 2001.
- [8] “NSF CAREER Proposal: My Experience,” presentation with Dr. Gary Isom at the Purdue briefing session for NSF Career competition, May 7, 2001.
- [9] “Young Faculty’s Experience: Focus on the Important Things,” Fall Faculty Research Orientation, Sept. 25, 2001.

- [10] “An Interactive Chair-Based Interface,” Second Annual Information Technology Workshop, Oct. 24, 2001.
- [11] “Haptic Priming of Visual Attention,” guest lecturer, CGT411 Contemporary Problems in Applied Computer Graphics (Prof. Terry Burton, CGT), Sept. 20, 2002.
- [12] “Haptic Perceptualization of Nano-scale Data,” interactive demo with Seungmoon Choi, Laron Walker, and Prof. Ron Reifenberger (Physics), NASA INAC Official Kick-Offs and Combined Workshop, Jan. 16, 2003.
- [13] “Haptic Priming of Visual Attention,” Human Factors and Ergonomics Society, School of Industrial Engineering and Department of Psychological Sciences, Grissom 166, Feb. 20, 2003.
- [14] “The Fundamentals of Perception Based Engineering,” with Prof. Zygmunt Pizlo (Psychology), Herrick Laboratories Partners Program Research Review, Herrick Laboratories, Apr. 2, 2003.
- [15] “Haptics in Data Perceptualization,” with Gary Bertoline, Computing Research Institute / High Performance Computing panel, Apr. 20, 2007.
- [16] “Overview of Haptic Interfaces and its Applications in VR,” guest lecturer for “CGT515 Introduction to Virtual Environments,” Purdue University, West Lafayette, IN, February 12, 2008.
- [17] “Haptic Cuing of Visual Spatial Attention,” *Human Factors and Ergonomics Society Meeting*, Purdue University, West Lafayette, IN, November 11, 2008.
- [18] “Building a Research Enterprise,” *Technology Faculty Workshop: Building Your Research Enterprise*, West Lafayette, IN, December 5, 2008.

***outside Purdue University – other than keynote or plenary addresses***

- [1] “Advanced Interface Technology: Augmentative Communication by Eye, Hand and Voice,” Miniseminar at the *Annual Meeting of the American Speech and Hearing Association*, Atlanta, GA, Nov., 1991.
- [2] “Copy the Code through Fingertips,” *Boston Amateur Radio Club*, Cambridge, MA, Apr. 20, 1994.
- [3] “Haptic Human-Machine Interfaces,” *University of Michigan, College of Engineering Control Seminar*, Ann Arbor, MI, Mar. 10, 2000.

- [4] "A Chair-based Haptic System," Stanford University, Center for Design Research, Stanford, CA, Mar. 15, 2001.
- [5] "A Chair-based Haptic System," University of California Berkeley, *Department of Bioengineering Haptics Seminar*, Berkeley, CA, Mar. 15, 2001.
- [6] "A Chair-based Haptic System," Immersion Corp., San Jose, CA, Mar. 16, 2001.
- [7] "A Chair-based Haptic System," Massachusetts Institute of Technology, The Media Laboratory, Cambridge, MA, May 3, 2001.
- [8] "A Chair-based Haptic System," Kimball International, Division of Product Design and Research, Furniture and Cabinet Group, Jasper, IN, May 24, 2001.
- [9] "A Chair-based Haptic System," Ford Research Laboratory, Dearborn, MI, July 30, 2001.
- [10] "A Chair-based Haptic System," Video conference with Ford Research Laboratory (Gary Rupp, Dave Hoffmeister, John Shutko, and Shannon O'Day in Dearborn, MI; and Andreas Scheffler in Merkenich, Germany), Sept. 10, 2001. (This talk was delivered to interested Ford researchers who could not attend my talk in Dearborn, MI on July 30, 2001.)
- [11] "A Chair-based Haptic System," Ohio State University, Department of Computer and Information Science, Columbus, OH, May 30, 2002.
- [12] "Haptic Priming of Visual Attention," The George Washington University, Department of Computer Science, Washington, DC, Nov. 7, 2002.
- [13] "Haptic Priming of Visual Attention," NASA Ames Research Center, Moffet Field, CA, May 22, 2003.
- [14] "Haptic Interfaces," a presentation to Purdue ECE Alumni, Palo Alto, CA, May 23, 2003.
- [15] "Towards Realistic Haptic Rendering of Surface Texture," University of Washington, Seattle, WA, Sept. 22, 2003.
- [16] ***Invited Participant***, *The 15th Annual Beckman Frontiers of Science Symposium*, sponsored by the National Academy of Sciences, Arnold and Mabel Beckman Center, Irvine, CA, Nov. 6-8, 2003. (One of 70 young scientists invited to "learn about research at the cutting edge of other disciplines while building new ties between future leaders of our nation's scientific enterprise.")

- [17] "Haptic Priming of Visual Attention," University of Mannheim, Mannheim, Germany, June 9, 2004.
- [18] "Towards Realistic Haptic Rendering of Surface Texture," Beijing University of Aeronautics and Astronautics, Beijing, P. R. China, July 13, 2004.
- [19] "A Human-Centered Approach to Haptic Interface Research," *NSF IGERT Seminar Series*, University of California, Santa Barbara, CA, Oct. 29, 2004.
- [20] "A Human-Centered Approach to Haptic Interface Research," School of Engineering, University of California, Merced, CA, Nov. 2, 2004.
- [21] "A Human-Centered Approach to Haptic *Interface Research*," ***Distinguished Invited Speaker Series***, Department of Computer Science, The University of British Columbia, Vancouver, British Columbia, Canada, Nov. 18, 2004.
- [22] "Haptic Interfaces for Automobiles," The Volkswagen of America Electronics Research Lab, Palo Alto, CA, Dec. 7, 2004.
- [23] "Towards Realistic Haptic Rendering of Surface Texture," TouchLab, Interdepartmental Centre "E. Piaggio," University of Pisa, Pisa, Italy, Mar. 22, 2005.
- [24] "Towards Realistic Rendering of Haptic Virtual Texture," Laboratory for Intelligent Mechanical Systems (LIMS), Department of Mechanical Engineering, Northwestern University, Evanston, IL, Apr. 26, 2005.
- [25] "Recent Applications of Haptics: Watermarking, Atomic Force Microscopy, and Surgical Simulation," Beijing University of Aeronautics and Astronautics, Beijing, P. R. China, July 4, 2005.
- [26] "From Student to Scholar: My Personal Experience at MIT," Beijing University of Aeronautics and Astronautics, Beijing, P. R. China, July 5, 2005.
- [27] "Student First: Teaching, Advising and Conducting Interdisciplinary Research at Purdue University," Beijing University of Aeronautics and Astronautics, Beijing, P. R. China, July 6, 2005.
- [28] "Recent Trend in Haptics Research and Applications," Shanghai Jiao Tong University, Shanghai, P. R. China, July 12, 2005.
- [29] "A Sensing Chair, a Haptic Back Display, and Texture Perception and Watermarking," Department of Information Engineering, University of Siena, Italy, Feb. 15, 2006.

- [30] “Haptic Psychophysics,” guest lecturer for “CS277 Experimental Haptics,” Stanford University, Palo Alto, CA, May 23, 2006.
- [31] “Vibrotactile Detection, Masking and Channel Capacity in Tacton Design,” Department of Computing Science, University of Glasgow, UK, Aug. 24, 2006.
- [32] “Haptic Numerosity Judgment, Change Detection, and Force Constancy,” Sensory Motor Neuroscience Centre, University of Birmingham, UK, Aug. 29, 2006.
- [33] **Invited Session Chair**, “Bionics/Human Machine Interface,” *Ninth Annual Kavli Chinese-American Frontiers of Science Symposium*, sponsored by the Chinese Academy of Sciences and the U.S. Academy of Sciences, Arnold and Mabel Beckman Center, Irvine, CA, Oct. 26-28, 2006.  
 (Participation is by invitation only from the U.S. Academy of Sciences. Videostramed presentation available at:  
<http://progressive.playstream.com/beckmanfrontiers/progressive/cafos06/HongTan/HongTan.html>)
- [34] “Haptic Force Constancy and its Implications for Scientific Data Perceptualization,” School of Life Sciences, Shanghai Jiao Tong University, P. R. China, May 31, 2007.
- [35] “Psychophysics on Haptic Perception of Mechanical Properties,” guest lecturer for “CS277 Experimental Haptics,” Stanford University, Palo Alto, CA, April 17, 2008.
- [36] “Frontiers of Haptics Research and Applications (触觉研究与应用的最新进展),” *Frontiers of Science Forum Series (25<sup>th</sup> lecture)*, Shanghai Jiao Tong University, Shanghai, P.R. China, May 14, 2008. (This was a campus-wide seminar.)
- [37] “Crossmodal Attentional Links among Touch, Vision and Audition (触觉、视觉、听觉跨模式注意力的联系),” presented as part of the **Guest Researcher Ceremony** at the Institute of Life Science and Technology, Shanghai Jiao Tong University (上海交通大学生命科学技术学院), Shanghai, P.R. China, May 22, 2008.
- [38] “Haptic Perception of Mechanical Properties via Force Displays,” Department of Computer Science, Universidad Rey Juan Carlos, Madrid, Spain, June 9, 2008.
- [39] “Haptic Cuing of Visual Spatial Attention,” DePauw University Psychology Department, Greencastle, IN, September 16, 2008.



- [40] “Haptic Perception of Mechanical Properties via Force Displays,” Institute for Automatic Control Engineering (LSR), Technical University of Munich, Munich, Germany, November 25, 2008.
- [41] “The Haptic Cuing of Visual Spatial Attention: Evidence of a Spotlight Effect,” School of Interactive Computing, College of Computing, Georgia Institute of Technology, Atlanta, Georgia, January 28, 2009.
- [42] “Haptic Perception of Mechanical Properties via Force Displays,” Department of Mechatronics, Gwangju Institute of Science and Technology, Gwangju, Korea, July 20, 2009.
- [43] “Design and Evaluation of Distinctive Haptic Signals,” Department of Mechatronics, Gwangju Institute of Science and Technology, Gwangju, Korea, July 21, 2009.
- [44] “Design and Evaluation of Distinctive Haptic Signals,” Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea, July 22, 2009.
- [45] “Design and Evaluation of Distinctive Haptic Signals,” Pohang Institute of Intelligent Robotics (PIRO), Pohang, Korea, July 23, 2009.
- [46] “Haptic Cuing of Visual Attention and its Application in Multimodal Warning Systems,” Department of Computer Science and Engineering, Pohang University of Science and Technology (POSTECH), Pohang, Korea, July 24, 2009.
- [47] “Haptic Psychophysics for the Design and Evaluation of Distinctive Haptic Signals,” guest lecturer for “CS277 Experimental Haptics,” Stanford University, Palo Alto, CA, January 7, 2010.
- [48] “Does Touch Perform Fourier Analysis? A Frequency-Domain Analysis of Haptic Gratings,” Robotics Institute, School of Computer Science, Carnegie Mellon University, Pittsburgh, PA, January 22, 2010.
- [49] “An Investigation into the Linearity of Haptic Texture Perception,” Microsoft Research Asia, Beijing, P. R. China, June 24, 2010.
- [50] “Towards Haptic Synthesis of Surface Texture,” University of Michigan – Shanghai Jiao Tong University Joint Institute, Shanghai Jiao Tong University, Shanghai, P. R. China, June 25, 2010.
- [51] “Haptics in Education: Initial Studies on the Efficacy of Visuohaptic Simulations,” Percepts and Concepts Laboratory, Indiana University Bloomington, Bloomington, IN, November 5, 2010.

- [52] “Bringing Back Feel to Handheld Devices,” Microsoft Research Asia Center for Hardware (MACH), Shenzhen, P. R. China, November 15, 2010.
- [53] “Haptic Technology and Its Applications,” *TechTalk Event* at Microsoft Research Asia Center for Hardware (MACH), Shenzhen, P. R. China, November 15, 2010.
- [54] “Bringing Back Feel to Handheld Devices,” Microsoft Research Asia, Beijing, P. R. China, November 17, 2010.
- [55] “Recent Trends in Haptics Research,” HCI & Media Integration Institute, Department of Computer Science, Tsinghua University, Beijing, P. R. China, September 13, 2011.
- [56] “Haptics Research and its Applications in HCI (触觉研究在 HCI 中的应用),” China Computer Federation (CCF) Young Computer Scientists & Engineers Forum (YOCSEF), Symposium on Natural Human Computer Interface Technology, Chinese Academy of Sciences, April 13, 2012. (One of three invited speakers)
- [57] “Technology Trend of Natural User Interface: Touch and be Touched,” *Microsoft TechBench Conference*, Beijing, P. R. China, April 19, 2012. (This is a conference on new technology trends for high potential Microsoft employees. There are three invited speakers. Each speaker issues a challenge for the attendees. Two six member teams work on the haptic interface challenge in their spare time. The teams make their final presentations in August 2012.)
- [58] “Haptics and Its Applications in Human Computer Interface and Design (触觉技术及其在人机界面和设计中的应用),” *Department of Information Art & Design Lecture Series*, Academy of Arts and Design, Tsinghua University (清华大学美术学院信息艺术设计系系列讲座), Beijing, P. R. China, 13:30 – 16:30, April 23, 2012.
- [59] “Haptics and its Application in Data Perceptualization,” *Visualization and Visual Computing Group Seminar* (北大可视化学术讲座), Center for Information Science, School of Electrical Engineering and Computer Science, Peking University, Beijing, P. R. China, May 3, 2012.
- [60] “Two Cases Studies in Haptics: Mobile and Keyboard,” *Nokia Innovation Center*, Tampere, Finland, June 12, 2012.
- [61] “Adding Touch Feedback to Human Computer Interactions,” *China Symposium on Human Computer Interaction 2012* (a.k.a. *2012 China HCI Distinguished Speakers Day*), ACM SIGCHI China Chapter,

Chinese Academy of Sciences, Beijing, P. R. China, June 18, 2012.  
(One of three invited speakers.)

- [62] **Invited talk**, “触觉研究和技术的现状和前景展望,” *Virtual Reality and Digital Media Technology Strategic Development Forum* (虚拟现实与数字媒体技术发展战略研讨会), Beijing, P. R. China, September 5, 2012.  
(Organized by the Advanced Technology Research and Development Center of the Chinese Ministry of Science and Technology.)
- [63] “Introduction to Haptics Technology & Recent Research at Microsoft Research Asia,” *Microsoft Asia Center for Hardware*, Shenzhen, China, September 6, 2012.
- [64] “A Masking Study of Key-Click Feedback Signals on a Virtual Keyboard,” *Department of Psychology Seminar Series*, Beijing University, Beijing, China, September 14, 2012.
- [65] “Human Computer Interaction @ Microsoft Research Asia,” *Herrick Lab Industry Advisory Committee Dinner*, West Lafayette, Indiana, USA, October 5, 2012.
- [66] “Haptic Perception of Mechanical Properties via Force Displays,” Rehabilitation Engineering Research Institute, Shanghai Jiao Tong University, Shanghai, P. R. China, May 19, 2014.
- [67] “Fingertip Haptic Feedback on Touchscreens,” Invited Panelist, Operational Applications of Tactile and Multimodal Research and Displays panel, *5<sup>th</sup> International Congress on Applied Human Factors and Ergonomics*, Krakow, Poland, July 21, 2014.
- [68] “Feel the Touchscreen with Your Fingertip,” Microsoft Research Asia 2014 Student Summer Camp, Beijing, P. R. China, August 18, 2014.
- [69] “Haptics at the Fingertips,” Microsoft Research Asia 2014 Asia Faculty Summit, Beijing, P. R. China, October 31, 2014.
- [70] “Design of Haptic Interactions for Wearables and Beyond,” College of Design and Innovation, Tongji University, Shanghai, P. R. China, December 22, 2014.
- [71] “Haptic Feedback at the Fingertips for Consumer Electronics,” *Frontiers of Engineering Lecture Series*, Scuola Superiore Sant'Anna, Pisa, Italy, January 28, 2015.
- [72] “So You Want to Make a Product,” Industrial Forum, *IEEE-RAS International Conference on Robotics and Automation (ICRA 2015)*, Seattle, WA, May 27, 2015.

- [73] “Touch and Feel through Wearables: How and Why,” *WEAR 2016*, Boston, MA, May 24-26, 2016.

### **Tutorials, Workshop and Short Courses**

- [1] “Psychophysical Methods for User Interface Design and Evaluation,” with Zygmunt Pizlo, at *Ninth International Conference on Human-Computer Interaction (HCI International 2001)*, New Orleans, LA, 8:30 am – 5:00 pm, Aug. 7, 2001.
- [2] “Information Transfer: An Introduction Emphasizing Interaction between Stimulus Dimensions,” at *Eighth International Conference on Auditory Display (ICAD2002)*, held at Advanced Telecommunications Research Institute (ATR), Kyoto, Japan, July 2, 2002.
- [3] “Psychophysics for User Interface,” with Zygmunt Pizlo, at *Tenth International Conference on Human-Computer Interaction (HCI International 2003)*, Crete Island, Greece, 9:00 am – 1:00 pm, June 23, 2003.
- [4] “Psychophysics for User Interface Design and Evaluation,” with Zygmunt Pizlo, at *Eleventh International Conference on Human-Computer Interaction (HCI International 2005)*, Las Vegas, NV, 8:30 am – 5:00 pm, July 24, 2005.
- [5] “Wearable Vibrotactile Haptic Displays,” presented as part of a full-day course entitled “Recent Advances in Haptic Rendering & Applications (No. 11),” with Ming C. Lin, Miguel Otaduy (co-organizers), Federico Barbagli, Bill Baxter, Elaine Cohen, David Johnson, Roberta Klatzky, Bill McNeely, Dinesh Pai, and Russell Taylor, at *SIGGRAPH 2005*, Petree Hall D, Los Angeles, CA, 8:30 am – 5:30 pm, July 31, 2005.
- [6] “Toward Realistic Haptic Rendering of Textures,” presented as part of a full-day course entitled “Recent Advances in Haptic Rendering & Applications (No. 11),” with Ming C. Lin, Miguel Otaduy (co-organizers), Federico Barbagli, Bill Baxter, Elaine Cohen, David Johnson, Roberta Klatzky, Bill McNeely, Dinesh Pai, and Russell Taylor, at *SIGGRAPH 2005*, Petree Hall D, Los Angeles, CA, 8:30 am – 5:30 pm, July 31, 2005.
- [7] “Assessing Perceived Quality of Virtual Haptic Surfaces and Textures,” presented as part of a half-day workshop on “Perception-based Haptic Rendering,” with Matthias Harders, Anatole Lecuyer, Marc Ernst (co-organizers), Vincent Hayward, Gunter Niemeyer, and Alan Wing, at *EuroHaptics 2006*, Paris, France, July 3, 2006.

- [8] “Haptic Resolution of Mechanical Properties,” presented as part of a full-day workshop on “Haptic Perception & Rendering,” with Miguel A. Otaduy, Dinesh K. Pai (co-organizers), Antonio Bicchi, Vincent Hayward, Gunter Niemeyer, and Stephane Redon, at *2007 IEEE International Conference on Robotics and Automation (ICRA’07)*, Rome, Italy, 8:30 am – 6:00 pm, April 10, 2007.
- [9] “Haptic Perception of Mechanical Properties via Force Displays,” presented to 40+ Chinese haptics researchers gathered during *The 5th Annual Conference of Virtual Reality Technology in China* (第5届中国2008VR国际峰会), Beijing, P.R. China, May 17, 2008.
- [10] “Haptics, Attention and Scenario-Based Design: A Hands-On Workshop”, with Karon MacLean, at *EuroHaptics’08*, Madrid, Spain, 3:00–7:00 pm, June 10, 2008. Sponsored by Force Dimension.
- [11] “Psychophysical Methods for User Interface Design and Evaluation,” Department of Mechatronics, Gwangju Institute of Science and Technology, Gwangju, Korea, 2:00 pm – 6:00 pm, July 21, 2009.
- [12] “Psychophysical Methods in Haptic Research,” with Lynette Jones, at *World Haptics Conference 2011*, Istanbul, Turkey, 9:00 am – 1:00 pm, June 21, 2011.
- [13] “Haptic Perception, Technology Overview and Interface Design,” Workshop presented at Beijing Normal University, Beijing, P. R. China, 1:30 – 4:30 pm, August 29, 2016.

### **Panelist**

- [1] Panelist, “Panel Discussion on Perception-Based Engineering,” *IEEE eit 2003 Conference*, Indianapolis, IN, June 6, 2003.
- [2] Panelist, “Connect with America,” organized by Association for Purdue Chinese Alumni and Purdue University China Center, Nov. 12, 2007.
- [3] Panelist, “Disruptive Technology,” *The 14th Computing in the 21st Century Conference (21CCC)*, jointly organized by Microsoft Research Asia and Nankai and Tianjin Universities, Tianjin Auditorium, Tianjin, China, October 25, 2012.
- [4] Panelist, “Operational Applications of Tactile and Multimodal Research and Displays,” organized by B. Lawson, A. Rupert and R. Cholewiak, *5th International Conference on Applied Human Factors and Ergonomics (AHFE 2014)*, Krakow, Poland, July 19-23, 2014.

## ACTIVITIES AS A REVIEWER / REFEREE

- 1999 – present National Science Foundation, USA
- 2001 – present Natural Sciences and Engineering Research Council of Canada (NSERC)
- 2003 – present Hong Kong Research Grants Council (RGC)
- 2005 – present European Commission, European Union
- 2008 – present Israel Science Foundation (ISF)
- 2008 – present Engineering and Physical Sciences Research Council (EPSRC), United Kingdom
- 2013 – 2014 Scuola Superiore Sant’Anna, Pisa, Italy  
*Member of the International Advisory Committee, appointed by the Managing Committee of the TeCIP Institute (Institute of Communication, Information and Perception Technologies).*
- 2016 – present Chilean National Science and Technology Commission (CONICYT – Chile)

## MEDIA COVERAGE

### at Purdue University

- [1] Nick Giordano, “Micro-gravity Team Hopes to Fly NASA ‘Vomit Comet’,” *The Exponent (Purdue’s Independent Daily Student Newspaper)*, p. 12, Dec. 10, 1999.
- [2] Emil Venere, “Purdue Engineers Develop a Chair with ‘Sense’,” *Purdue News*, <http://news.uns.purdue.edu/html4ever/001103.Tan.smartchair.html>, Nov. 3, 2000.
- [3] “Faculty Profile: Hong Z. Tan,” *Purdue University Women Engineers Newsletter*, p. 7, Fall 2000.
- [4] Lisa Hunt Tally, “Claiming the Human Factor: Perception-Based Engineering,” *Purdue Engineering Extrapolations (a Magazine for Alumni and Friends)*, p. 6–11, Fall 2000.
- [5] Chris Baumbauer, “Professor Invents Seat to Sense Poor Posture,” *The Exponent (Purdue’s Independent Daily Student Newspaper)*, p. 3, Dec. 4, 2000.

- [6] Linda Terhune, "Haptics Research and the Virtual Touch (p. 29)," *Annual Research Report – Sensorium*, Office of the Executive Vice President for Research and Partnership, Purdue University, 2013|2014.

### **outside Purdue University**

- [1] Lisa Guernsey, "Magic-Carpet Chairs of Virtual Reality," *New York Times – What's Next*, May 6, 1999.
- [2] Lisa Stark (reporter), "Flying Blind: The Causes and Consequences of Spatial Disorientation," *ABC Discovery Channel News*, aired on Jul. 23 and 24, 1999.  
(*This news report includes a 30 second segment on the Haptic Directional Display project, and its potential to alleviate spatial disorientation.*)
- [3] "Smart Chair," *News Channel TV18* (11 p.m. News), Lafayette, IN, Nov. 15, 2000.
- [4] Peter Weiss, "Chair becomes personalized posture coach," *Science News*, Vol. 158, No. 21, p. 327, Nov. 18, 2000.
- [5] Marcelo Torres, "Crean la primera silla inteligente (They have created the first intelligent chair)," *Clarín* (published in Argentina), Informacion General, p. 54, Dec. 13, 2000.  
(<http://ar.clarin.com/diario/2000-12-13/s-05401.htm>)
- [6] "A chair with sense," *IIE Solutions – The Magazine for Industrial Engineers and Managers*, p. 16, Jan. 2001.
- [7] Karin Heineman (producer), "The Perfect Chair," *American Institute of Physics – Discoveries & Breakthroughs Inside Science*, Feb., 2001.  
(*Heineman produces 90-second stories that are broadcast to local TV news stations across the country.*)
- [8] Rosie Mestel, "Chairs Take Over Mom's 'Sit Up Straight' Order," *Los Angeles Times (Health Column)*, reappeared later in *Evansville Courier & Press*, Feb. 22, 2001.
- [9] Rosie Mestel (Los Angeles Times), "Smart Office," *The Dallas Morning News (WorkEtc. Section)*, Mar. 13, 2001.
- [10] Mark Schrope, "Simply Sensational," *New Scientist Magazine*, No. 2293, pp. 30-33, June 2, 2001.
- [11] "Sitting Smart," *University Business Magazine*, Vol. 4, No. 6, p. 70, July/August, 2001.

- [12] “Furniture with Feelings: Bad Posture – The Chair Sounds Alarm,” *P.M. Magazin: Die moderne Welt des Wissens (A Magazine by Peter Moosleitners: The Modern World of Knowledge)*, p. 35, August 2001.
- [13] Alex Pham, “Computer developers aiming to exterminate the mouse,” *Los Angeles Times (Business section)*, p. C6, Aug. 14, 2001.
- [14] Michael Stroud, “What’s On Tap? Why, Haptics,” *Wired News (Business section)*, August 21, 2001.  
(<http://wired.com/news/business/0,1367,46192,00.html>)
- [15] Melinda P. Grenier, “Reporter’s Notebook: Conference on Graphics Hit by Tech Slump,” *The Wall Street Journal Online (WSJ.com)*, Aug. 21, 2001.
- [16] David Akin, “Sensational Devices,” *The Globe and Mail – Canada’s Most Trusted News Source*, p. F7, Jan. 19, 2002.
- [17] Sandra Yin, “FUTURE SPEAK: Science’s Potential to Create New Markets,” *American Demographics*, Vol. 24, No. 8, p. 68, Sept. 2002.
- [18] Will Knight, “What Comes After the Touch Screen?” *MIT Technology Review (online)*, October 11, 2012.
- [19] “指尖上的真实：微软人机交互技术,” *Chinese Chip Magazine*, June 1, 2014.  
(<http://www.chip.cn/article-72-1.html>)
- [20] “Haptics 技术：在触屏上实现物理按钮效果,” *Chinese sina.com.cn Science and Technology page*, July 16, 2014.  
([http://tech.sina.com.cn/zl/post/detail/it/2014-07-16/pid\\_8457130.htm](http://tech.sina.com.cn/zl/post/detail/it/2014-07-16/pid_8457130.htm))  
(<http://www.msra.cn/zh-cn/news/features/haptics.aspx>)
- [21] “Beyond Tapping and Sliding,” *Microsoft Research News Release*, Aug. 5, 2014.  
(<http://research.microsoft.com/en-us/news/features/haptics-080514.aspx>)
- [22] “Microsoft’s Touch Screen Innovations (智能手机革新 触感屏幕‘摸’时间),” *Hong Kong Economic Times*, June 29, 2015.  
(<http://www.hket.com/eti/article/291128e3-8f20-48f0-b23b-359aa4985fac-896085?section=011>)
- [23] “Microsoft Beijing’s Innovation in Touchscreen Technology (北京微软创‘有触感’轻触屏),” *Ming Bao Daily News (香港明报新闻网)*, June 29, 2015.



([http://news.mingpao.com/pns/北京微軟創「有觸感」輕觸屏-革命技術%20%20失明人士受惠/web\\_tc/article/20150629/s00002/1435514281380](http://news.mingpao.com/pns/北京微軟創「有觸感」輕觸屏-革命技術%20%20失明人士受惠/web_tc/article/20150629/s00002/1435514281380))

### **Quoted by Media**

- [1] JV Chamary, “‘3D Touch’ in iPhone 6s Isn’t Just a Gimmick. Here’s How It Works,” *Forbes/Science*, Sept. 12, 2015.  
<http://www.forbes.com/sites/jvchamary/2015/09/12/3d-touch-iphone-6s/>
  
- [2] JV Chamary, “The Next iPhone Won’t Be Inspired by 3D Touch, But Apple’s Taptic Engine,” *Forbes/Science*, Sept. 2, 2015.  
<http://www.forbes.com/sites/jvchamary/2015/09/25/haptic-feedback/>