



Allison Okamura

Richard W. Weiland Professor in the School of Engineering and Professor, by courtesy, of Computer Science

Mechanical Engineering

 Curriculum Vitae available Online

CONTACT INFORMATION

- **Administrative Contact (Research)**

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Bio

BIO

Allison M. Okamura received the BS degree from the University of California at Berkeley in 1994, and the MS and PhD degrees from Stanford University in 1996 and 2000, respectively, all in mechanical engineering. She is currently Professor in the mechanical engineering department at Stanford University, with a courtesy appointment in computer science. She was previously Professor and Vice Chair of mechanical engineering at Johns Hopkins University. She is currently the Editor-in-Chief of the journal IEEE Robotics and Automation Letters. She has been an associate editor of the IEEE Transactions on Haptics, editor-in-chief of the IEEE International Conference on Robotics and Automation Conference Editorial Board, an editor of the International Journal of Robotics Research, and co-chair of the IEEE Haptics Symposium. Her awards include the 2020 IEEE Engineering in Medicine and Biology Society Technical Achievement Award, 2019 IEEE Robotics and Automation Society Distinguished Service Award, 2016 Duca Family University Fellow in Undergraduate Education, 2009 IEEE Technical Committee on Haptics Early Career Award, 2005 IEEE Robotics and Automation Society Early Academic Career Award, and 2004 NSF CAREER Award. She is an IEEE Fellow. Her academic interests include haptics, teleoperation, virtual environments and simulators, medical robotics, soft robotics, neuromechanics and rehabilitation, prosthetics, and education. Outside academia, she enjoys spending time with her husband and two children, running, and playing ice hockey.

ACADEMIC APPOINTMENTS

- Professor, Mechanical Engineering
- Member, Bio-X
- Faculty Affiliate, Institute for Human-Centered Artificial Intelligence (HAI)
- Member, Wu Tsai Human Performance Alliance
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Distinguished Service Award, IEEE Robotics and Automation Society (2019)
- Stanford Fellow, Stanford University (2018-2020)
- Best Student Presentation Award (student author: Sean Sketch), IEEE Haptics Symposium (2018)
- Finalist, Best Paper in Human Robot Interaction, IEEE International Conference on Robotics and Automation (2018)

- Gilbreth Lecturer, National Academy of Engineers (2018)
- Tau Beta Pi Teaching Honor Roll, Stanford University (2018)
- Ten Robotics Technologies of the Year (Soft robot that navigates through growth), Science Robotics (2018)
- ACM CHI Best Paper Award, ACM SIGCHI 2017 conference (2017)
- Society of Scholars, Johns Hopkins University (2017)
- Duca Family University Fellow in Undergraduate Education, Stanford University (2016)
- Best Student Paper Award (student author: Zhan Fan Quek), IEEE Haptics Symposium (2014)
- Robert Bosch Faculty Scholar, Stanford University (2011-2015)
- Gabilan Fellow, Stanford University (2011)
- IEEE Fellow, Institute of Electrical and Electronics Engineers (2010)
- Early Career Award, IEEE Technical Committee on Haptics (2009)
- Alumni Distinguished Scholar, Stanford University (2008)
- Decker Faculty Scholar, Johns Hopkins University (2007-2010)
- Award for Excellence, Outstanding Paper of the Year in Industrial Robot, Literati Club (2005)
- Early Academic Career Award, IEEE Robotics and Automation Society (2005)
- CAREER Award, National Science Foundation (2004-2009)
- Diversity Recognition Award, Johns Hopkins University (2003)

PROFESSIONAL EDUCATION

- BS, University of California, Berkeley , Mechanical Engineering (1994)
- MS, Stanford University , Mechanical Engineering (1996)
- PhD, Stanford University , Mechanical Engineering (2000)

LINKS

- CHARM Lab website: <http://charm.stanford.edu>
- CHARM Lab YouTube channel: https://www.youtube.com/channel/UC_L3pNslH0J3znNsL3CbFYQ
- Google Scholar page: <https://scholar.google.com/citations?user=ID4Yjn4AAAAJ&hl=en&oi=ao>
- Personal webpage: <http://charm.stanford.edu/Main/AllisonOkamura>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My research focuses on developing the principles and tools needed to realize advanced robotic and human-machine systems capable of physical interaction. Topics of particular interest are: (1) Teleoperation: Devices, models, and control systems that allow human operators to manipulate environments that are remote in scale and/or distance. (2) Haptic systems: Devices, models, and control systems that enable compelling touch-based interaction with virtual environments, computers, and remote robots. (3) Robotic manipulation: Robots that physically manipulate their environment or their own shape, incorporating novel designs, sensors, and control systems. Application areas include surgery, simulation and training, rehabilitation, prosthetics, neuromechanics, exploration of hazardous and remote environments (e.g. space), design, and education.

CLINICAL TRIALS

- Effects of a Compliant Arm Support on Post-stroke Upper Extremity Range of Motion, Not Recruiting
- Passive Tactile Stimulation for Stroke Rehabilitation, Not Recruiting

Teaching

COURSES

2022-23

- Design and Control of Haptic Systems: ME 327 (Spr)
- Introduction to Mechanical Engineering: ME 1 (Aut)

2021-22

- Design and Control of Haptic Systems: ME 327 (Spr)
- Feedback Control Design: ENGR 105 (Win)

2020-21

- Feedback Control Design: ENGR 105 (Spr)

2019-20

- Design and Control of Haptic Systems: ME 327 (Spr)
- Feedback Control Design: ENGR 105 (Win)
- Soft Robots for Humanity: ME 23N (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Rachel Adenekan, Julia Butterfield, Elyse Chase, Tony Chen, Shivani Guptasarma, Taylor Howell, Kirsten Seagers, Jon Stingel, Guan Rong Tan, Elliot Weiss

Postdoctoral Faculty Sponsor

Ryo Eguchi, Zhenish Zhakypov, Cosima du Pasquier

Doctoral Dissertation Advisor (AC)

Nathaniel Agharese, Catie Cuan, Yiqing Ding, Brian Do, Taylor Howell, Rianna Jitosh, Sreela Kodali, Godson Osele, Jasmin Palmer, Yimeng Qin, Millie Salvato, Crystal Winston, Kyle Yoshida

Master's Program Advisor

Burzin Balsara, Tejas Deo, Sean Fowler, Andrew Franco, Nitish Gudapati, Bryce Huerta, Aby Jose, Anupama Phatak, Mahesh Saboo, Nicole Salz, Nicholas Tan, Rachel Wallstrom

Doctoral Dissertation Co-Advisor (AC)

Elizabeth Childs, Dan Ilyin, Carolyn Kim, Okkeun Lee, Elizabeth Vasquez

Doctoral (Program)

Nathaniel Agharese, Julia Di, Taylor Howell, Ava Lakmazaheri, Olivia Tomassetti

Publications

PUBLICATIONS

- **Perceived Intensities of Normal and Shear Skin Stimuli Using a Wearable Haptic Bracelet** *IEEE ROBOTICS AND AUTOMATION LETTERS*
Sarac, M., Huh, T., Choi, H., Cutkosky, M. R., Di Luca, M., Okamura, A. M.
2022; 7 (3): 6099-6106
- **Data-Driven Sparse Skin Stimulation Can Convey Social Touch Information to Humans** *IEEE TRANSACTIONS ON HAPTICS*
Salvato, M., R. Williams, S., M. Nunez, C., Zhu, X., Israr, A., Lau, F., Klumb, K., Abnoui, F., M. Okamura, A., Culbertson, H.

2022; 15 (2): 392-404

- **A 4-Degree-of-Freedom Parallel Origami Haptic Device for Normal, Shear, and Torsion Feedback** *IEEE ROBOTICS AND AUTOMATION LETTERS*
Williams, S. R., Suchoski, J. M., Chua, Z., Okamura, A. M.
2022; 7 (2): 3310-3317
- **Predicting Hand-Object Interaction for Improved Haptic Feedback in Mixed Reality** *IEEE ROBOTICS AND AUTOMATION LETTERS*
Salvato, M., Heravi, N., Okamura, A. M., Bohg, J.
2022; 7 (2): 3851-3857
- **Design of a Wearable Vibrotactile Stimulation Device for Individuals With Upper-Limb Hemiparesis and Spasticity** *IEEE TRANSACTIONS ON NEURAL SYSTEMS AND REHABILITATION ENGINEERING*
Seim, C. E., Ritter, B., Starner, T. E., Flavin, K., Lansberg, M. G., Okamura, A. M.
2022; 30: 1277-1287
- **Geometric Solutions for General Actuator Routing on Inflated-Beam Soft Growing Robots** *IEEE TRANSACTIONS ON ROBOTICS*
Blumenschein, L. H., Koehler, M., Usevitch, N. S., Hawkes, E., Rucker, D., Okamura, A. M.
2021
- **Effects of Peripheral Haptic Feedback on Intracortical Brain-Computer Interface Control and Associated Sensory Responses in Motor Cortex** *IEEE TRANSACTIONS ON HAPTICS*
Deo, D. R., Rezaei, P., Hochberg, L. R., Okamura, A. M., Shenoy, K., Henderson, J. M.
2021; 14 (4): 762-775
- **Teaching With Hapkit Enabling Online Haptics Courses With Hands-On Laboratories** *IEEE ROBOTICS & AUTOMATION MAGAZINE*
Morimoto, T. K., Martinez, M., Davis, R. L., Blikstein, P., Okamura, A. M.
2021; 28 (3): 79-91
- **Body-Mounted Vibrotactile Stimuli: Simultaneous Display of Taps on the Fingertips and Forearm** *IEEE TRANSACTIONS ON HAPTICS*
Williams, S. R., Okamura, A. M.
2021; 14 (2): 432-444
- **Affective Ratings of Vibrotactile Signals in Older Adults With and Without History of Stroke**
Seim, C. E., Ritter, B., Flavin, K. E., Lansberg, M. G., Okamura, A. M., IEEE
IEEE.2021: 457-462
- **A Dynamics Simulator for Soft Growing Robots**
Jitosho, R., Agharese, N., Okamura, A., Manchester, Z., IEEE
IEEE.2021: 11775-11781
- **Macro-Mini Actuation of Pneumatic Pouches for Soft Wearable Haptic Displays**
Do, B. H., Okamura, A. M., Yamane, K., Blumenschein, L. H., IEEE
IEEE.2021: 14499-14505
- **Toward Force Estimation in Robot-Assisted Surgery using Deep Learning with Vision and Robot State**
Chua, Z., Jarc, A. M., Okamura, A. M., IEEE
IEEE.2021: 12335-12341
- **Augmented Haptic Guidance for Needle Insertion with a 2-DoF Wrist-Worn Haptic Device**
Sarac, M., Loke, D., Evans, M., Chong, O., Saunders, J., Makled, B., Okamura, A. M., Hallett, K., IEEE
IEEE.2021: 872
- **Embedded Laser-Cut Constraints for Elastomeric Soft Actuators**
Winston, C. E., Yoshida, K. T., Williams, S. R., Okamura, A. M., IEEE
IEEE.2021: 863
- **Human Perception of Wrist Torque Magnitude During Upper and Lower Extremity Movement**
Welker, C., Collins, S. H., Okamura, A. M., IEEE
IEEE.2021: 870
- **Augmented Needle Decompression Task with a Wrist-Worn Haptic Device**

- Sarac, M., Hallett, K., Saunders, J., Makled, B., Okamura, A. M., IEEE
IEEE.2021: 873
- **Design, Modeling, Control, and Application of Everting Vine Robots.** *Frontiers in robotics and AI*
Blumenschein, L. H., Coad, M. M., Haggerty, D. A., Okamura, A. M., Hawkes, E. W.
2020; 7: 548266
 - **Continuous Closed-Loop 4-Degree-of-Freedom Holdable Haptic Guidance** *IEEE ROBOTICS AND AUTOMATION LETTERS*
Walker, J. M., Okamura, A. M.
2020; 5 (4): 6853–60
 - **Efficient and Trustworthy Social Navigation via Explicit and Implicit Robot-Human Communication** *IEEE TRANSACTIONS ON ROBOTICS*
Che, Y., Okamura, A. M., Sadigh, D.
2020; 36 (3): 692–707
 - **Model-Based Design of a Soft 3-D Haptic Shape Display** *IEEE TRANSACTIONS ON ROBOTICS*
Koehler, M., Usevitch, N. S., Okamura, A. M.
2020; 36 (3): 613–28
 - **3D Electromagnetic Reconfiguration Enabled by Soft Continuum Robots** *IEEE ROBOTICS AND AUTOMATION LETTERS*
Gan, L. T., Blumenschein, L. H., Huang, Z., Okamura, A. M., Hawkes, E. W., Fan, J. A.
2020; 5 (2): 1704–11
 - **Retraction of Soft Growing Robots Without Buckling** *IEEE ROBOTICS AND AUTOMATION LETTERS*
Coad, M. M., Thomasson, R. P., Blumenschein, L. H., Usevitch, N. S., Hawkes, E. W., Okamura, A. M.
2020; 5 (2): 2115–22
 - **Robust navigation of a soft growing robot by exploiting contact with the environment** *INTERNATIONAL JOURNAL OF ROBOTICS RESEARCH*
Greer, J. D., Blumenschein, L. H., Alterovitz, R., Hawkes, E. W., Okamura, A. M.
2020
 - **An untethered isoperimetric soft robot.** *Science robotics*
Usevitch, N. S., Hammond, Z. M., Schwager, M., Okamura, A. M., Hawkes, E. W., Follmer, S.
2020; 5 (40)
 - **An untethered isoperimetric soft robot** *SCIENCE ROBOTICS*
Usevitch, N. S., Hammond, Z. M., Schwager, M., Okamura, A. M., Hawkes, E. W., Follmer, S.
2020; 5 (40)
 - **Investigating Social Haptic Illusions for Tactile Stroking (SHIFTS)**
Nunez, C. M., Huerta, B. N., Okamura, A. M., Culbertson, H., IEEE
IEEE.2020: 629–36
 - **Teleoperation of an ankle-foot prosthesis with a wrist exoskeleton.** *IEEE transactions on bio-medical engineering*
Welker, C. G., Chiu, V. L., Voloshina, A. n., Collins, S. n., Okamura, A. M.
2020; PP
 - **Human Interface for Teleoperated Object Manipulation with a Soft Growing Robot**
Stroppa, F., Luo, M., Yoshida, K., Coad, M. M., Blumenschein, L. H., Okamura, A. M., IEEE
IEEE.2020: 726-732
 - **Dynamically Reconfigurable Discrete Distributed Stiffness for Inflated Beam Robots**
Do, B. H., Banashek, V., Okamura, A. M., IEEE
IEEE.2020: 9050-9056
 - **Evaluation of Non-collocated Force Feedback Driven by Signal-independent Noise**
Chua, Z., Okamura, A. M., Deo, D. R., IEEE
IEEE.2020: 3686-3692
 - **A Tip Mount for Transporting Sensors and Tools using Soft Growing Robots**
Jeong, S., Coad, M. M., Blumenschein, L. H., Luo, M., Mehmood, U., Kim, J., Okamura, A. M., Ryu, J., IEEE

IEEE.2020: 8781-8788

- **AFREEs: Active Fiber Reinforced Elastomeric Enclosures**
Yoshida, K. T., Ren, X., Blumenschein, L. H., Okamura, A. M., Luo, M., IEEE
IEEE.2020: 305-11
- **Understanding Continuous and Pleasant Linear Sensations on the Forearm From a Sequential Discrete Lateral Skin-Slip Haptic Device** *IEEE TRANSACTIONS ON HAPTICS*
Nunez, C. M., Williams, S. R., Okamura, A. M., Culbertson, H.
2019; 12 (4): 414-27
- **Soft Haptic Device to Render the Sensation of Flying Like a Drone** *IEEE ROBOTICS AND AUTOMATION LETTERS*
Rognone, C., Koehler, M., Duriez, C., Floreano, D., Okamura, A. M.
2019; 4 (3): 2524-31
- **Resonant Frequency Skin Stretch for Wearable Haptics.** *IEEE transactions on haptics*
Shull, P. B., Tan, T., Culbertson, H. M., Zhu, X., Okamura, A.
2019
- **Stiffness Control of Deformable Robots Using Finite Element Modeling** *IEEE ROBOTICS AND AUTOMATION LETTERS*
Koehler, M., Okamura, A. M., Duriez, C.
2019; 4 (2): 469-76
- **Design and Analysis of Pneumatic 2-DoF Soft Haptic Devices for Shear Display** *IEEE ROBOTICS AND AUTOMATION LETTERS*
Kanjjanapas, S., Nunez, C. M., Williams, S. R., Okamura, A. M., Luo, M.
2019; 4 (2): 1365-71
- **Evaluation of Skin Deformation Tactile Feedback for Teleoperated Surgical Tasks** *IEEE TRANSACTIONS ON HAPTICS*
Quek, Z., Provancher, W. R., Okamura, A. M.
2019; 12 (2): 102-13
- **Effects of Different Hand-Grounding Locations on Haptic Performance With a Wearable Kinesthetic Haptic Device** *IEEE ROBOTICS AND AUTOMATION LETTERS*
Nisar, S., Martinez, M., Endo, T., Matsuno, F., Okamura, A. M.
2019; 4 (2): 351-58
- **Evolution and Analysis of Hapkit: An Open-Source Haptic Device for Educational Applications.** *IEEE transactions on haptics*
Orta Martinez, M. n., Nunez, C. M., Liao, T. n., Morimoto, T. K., Okamura, A. n.
2019
- **Perception of a Wearable Haptic Feedback Device to Render the Sensation of Flight**
Rognon, C., Koehler, M., Floreano, D., Okamura, A. M., IEEE
IEEE.2019: 61-66
- **3-DoF Wearable, Pneumatic Haptic Device to Deliver Normal, Shear, Vibration, and Torsion Feedback**
Yoshida, K. T., Nunez, C. M., Williams, S. R., Okamura, A. M., Luo, M., IEEE
IEEE.2019: 97-102
- **Holdable Haptic Device for 4-DOF Motion Guidance**
Walker, J. M., Zemiti, N., Poignet, P., Okamura, A. M., IEEE
IEEE.2019: 109-14
- **Vine Robots: Design, Teleoperation, and Deployment for Navigation and Exploration** *IEEE Robotics & Automation Magazine*
Coad, M., Blumenschein, L., Cutler, S., Reyna Zepeda, J., Naclerio, N., ElHussieny, H., Mehmood, U., Ryu, J., Hawkes, E., Okamura, A.
2019
- **Facilitating Human-Mobile Robot Communication via Haptic Feedback and Gesture Teleoperation** *ACM TRANSACTIONS ON HUMAN-ROBOT INTERACTION*
Che, Y., Culbertson, H., Tang, C., Aich, S., Okamura, A. M.
2018; 7 (3)

- **A Soft, Steerable Continuum Robot That Grows via Tip Extension** *SOFT ROBOTICS*
Greer, J. D., Morimoto, T. K., Okamura, A. M., Hawkes, E. W.
2019; 6 (1): 95–108
- **Toward the Design of Personalized Continuum Surgical Robots** *ANNALS OF BIOMEDICAL ENGINEERING*
Morimoto, T. K., Greer, J. D., Hawkes, E. W., Hsieh, M. H., Okamura, A. M.
2018; 46 (10): 1522–33
- **Toward the Design of Personalized Continuum Surgical Robots.** *Annals of biomedical engineering*
Morimoto, T. K., Greer, J. D., Hawkes, E. W., Hsieh, M. H., Okamura, A. M.
2018
- **Haptic Dimensions of Human-Robot Interaction** *ACM TRANSACTIONS ON HUMAN-ROBOT INTERACTION*
Okamura, A. M.
2018; 7 (1)
- **A Tip-Extending Soft Robot Enables Reconfigurable and Deployable Antennas** *IEEE ROBOTICS AND AUTOMATION LETTERS*
Blumenschein, L. H., Gan, L. T., Fan, J. A., Okamura, A. M., Hawkes, E. W.
2018; 3 (2): 949–56
- **Comparing Proprioceptive Acuity in the Arm between Joint Space and Task Space**
Sketch, S. M., Bastian, A. J., Okamura, A. M., Kuchenbecker, K. J., Gerling, G. J., Visell, Y.
IEEE.2018: 125–32
- **Obstacle-Aided Navigation of a Soft Growing Robot**
Greer, J. D., Blumenschein, L. H., Okamura, A. M., Hawkes, E. W., IEEE
IEEE COMPUTER SOC.2018: 4165–72
- **HapWRAP: Soft Growing Wearable Haptic Device**
Agharese, N., Cloyd, T., Blumenschein, L. H., Raitor, M., Hawkes, E. W., Culbertson, H., Okamura, A. M., IEEE
IEEE COMPUTER SOC.2018: 5466–72
- **Scaling Inertial Forces to Alter Weight Perception in Virtual Reality**
Suchoski, J. M., Martinez, S., Okamura, A. M., IEEE
IEEE COMPUTER SOC.2018: 484–89
- **Effects of Latency and Refresh Rate on Force Perception via Sensory Substitution by Force-Controlled Skin Deformation Feedback**
Zook, Z. A., Okamura, A. M., Kamikawa, Y., IEEE
IEEE COMPUTER SOC.2018: 506–11
- **APAM: Antagonistic Pneumatic Artificial Muscle**
Usevitch, N. S., Okamura, A. M., Hawkes, E. W., IEEE
IEEE COMPUTER SOC.2018: 1539–46
- **Avoiding Human-Robot Collisions using Haptic Communication**
Che, Y., Sun, C. T., Okamura, A. M., IEEE
IEEE COMPUTER SOC.2018: 5828–34
- **Magnified Force Sensory Substitution for Telemanipulation via Force-Controlled Skin Deformation**
Kamikawa, Y., Enayati, N., Okamura, A. M., IEEE
IEEE COMPUTER SOC.2018: 4142–48
- **Robotic Assistance-as-Needed for Enhanced Visuomotor Learning in Surgical Robotics Training: An Experimental Study**
Enayati, N., Okamura, A. M., Mariani, A., Pellegrini, E., Coad, M. M., Ferrigno, G., De Momi, E., IEEE
IEEE COMPUTER SOC.2018: 6631–36
- **Development and Evaluation of an Intuitive Flexible Interface for Teleoperating Soft Growing Robots**
El-Hussieny, H., Mehmood, U., Mehdi, Z., Jeong, S., Usman, M., Hawkes, E. W., Okamura, A. M., Ryu, J., Kosecka, J., Maciejewski, A. A., Okamura, A., Bicchi, A., Stachniss, et al
IEEE.2018: 4995–5002

- **Gaussian Process Dynamic Programming for Optimizing Ungrounded Haptic Guidance**
Walker, J. M., Okamura, A. M., Kochenderfer, M. J., Kosecka, J., Maciejewski, A. A., Okamura, A., Bicchi, A., Stachniss, C., Song, D. Z., Lee, D. H., Chaumette, F., Ding, H., Li, et al
IEEE.2018: 8758–64
- **Haptics: The Present and Future of Artificial Touch Sensation** *ANNUAL REVIEW OF CONTROL, ROBOTICS, AND AUTONOMOUS SYSTEMS, VOL 1*
Culbertson, H., Schorr, S. B., Okamura, A. M., Leonard, N. E.
2018; 1: 385–409
- **A Social Haptic Device to Create Continuous Lateral Motion using Sequential Normal Indentation**
Culbertson, H., Nunez, C. M., Israr, A., Lau, F., Abnoui, F., Okamura, A. M., Kuchenbecker, K. J., Gerling, G. J., Visell, Y.
IEEE.2018: 32–39
- **A soft robot that navigates its environment through growth.** *Science robotics*
Hawkes, E. W., Blumenschein, L. H., Greer, J. D., Okamura, A. M.
2017; 2 (8)
- **Highly Articulated Robotic Needle Achieves Distributed Ablation of Liver Tissue.** *IEEE robotics and automation letters*
Gerboni, G., Greer, J. D., Laeseke, P. F., Hwang, G. L., Okamura, A. M.
2017; 2 (3): 1367-1374
- **Design of a Compact Actuation and Control System for Flexible Medical Robots.** *IEEE robotics and automation letters*
Morimoto, T. K., Hawkes, E. W., Okamura, A. M.
2017; 2 (3): 1579-1585
- **Series Pneumatic Artificial Muscles (sPAMs) and Application to a Soft Continuum Robot.** *IEEE International Conference on Robotics and Automation : ICRA : [proceedings]. IEEE International Conference on Robotics and Automation*
Greer, J. D., Morimoto, T. K., Okamura, A. M., Hawkes, E. W.
2017; 2017: 5503–10
- **Three-dimensional skin deformation as force substitution: Wearable device design and performance during haptic exploration of virtual environments.** *IEEE transactions on haptics*
Schorr, S. B., Okamura, A.
2017
- **Deformable Model-Based Methods for Shape Control of a Haptic Jamming Surface.** *IEEE transactions on visualization and computer graphics*
Stanley, A. A., Okamura, A. M.
2017; 23 (2): 1029-1041
- **Perception of force and stiffness in the presence of low-frequency haptic noise.** *PloS one*
Gurari, N., Okamura, A. M., Kuchenbecker, K. J.
2017; 12 (6)
- **Haptic Orientation Guidance Using Two Parallel Double-Gimbal Control Moment Gyroscopes.** *IEEE transactions on haptics*
Walker, J. n., Culbertson, H. n., Raitor, M. n., Okamura, A. n.
2017
- **Open Source, Modular, Customizable, 3-D Printed Kinesthetic Haptic Devices**
Martinez, M., Campion, J., Gholami, T., Rittikaidachar, M. K., Barron, A. C., Okamura, A. M., Gerling, G., Otaduy, M. A., Ryu, J. H.
IEEE.2017: 142–47
- **Design of Patient-Specific Concentric Tube Robots Using Path Planning from 3-D Ultrasound**
Morimoto, T. K., Cerrolaza, J. J., Hsieh, M. H., Cleary, K., Okamura, A. M., Linguraru, M., IEEE
IEEE.2017: 165–68
- **Simulating the impact of sensorimotor deficits on reaching performance**
Sketch, S. M., Simpson, C. S., Crevecoeur, F., Okamura, A. M., Amirabdollahian, F., Burdet, E., Masia, L.
IEEE.2017: 31–37
- **Fingertip Tactile Devices for Virtual Object Manipulation and Exploration**

- Schorr, S. B., Okamura, A. M., ACM
ASSOC COMPUTING MACHINERY.2017: 3115–19
- **WAVES: A Wearable Asymmetric Vibration Excitation System for Presenting Three-Dimensional Translation and Rotation Cues**
Culbertson, H., Walker, J. M., Raitor, M., Okamura, A. M., ACM
ASSOC COMPUTING MACHINERY.2017: 4972–82
 - **Design of a Soft Catheter for Low-Force and Constrained Surgery**
Slade, P., Gruebele, A., Hammond, Z., Raitor, M., Okamura, A. M., Hawkes, E. W., Bicchi, A., Okamura, A.
IEEE.2017: 174–80
 - **Analysis of Effective Impedance Transmitted to the Operator in Position-Exchange Bilateral Teleoperation**
Colonnese, N., Okamura, A. M., Gerling, G., Otaduy, M. A., Ryu, J. H.
IEEE.2017: 328–33
 - **Propagation of Joint Space Quantization Error to Operational Space Coordinates and Their Derivatives**
Colonnese, N., Okamura, A. M., Bicchi, A., Okamura, A.
IEEE.2017: 2054–61
 - **Training in Divergent and Convergent Force Fields During 6-DOF Teleoperation with a Robot-Assisted Surgical System**
Coad, M. M., Okamura, A. M., Wren, S., Mintz, Y., Lendvay, T. S., Jarc, A. M., Nisky, I., Gerling, G., Otaduy, M. A., Ryu, J. H.
IEEE.2017: 195–200
 - **Design of 3-D Printed Concentric Tube Robots** *IEEE TRANSACTIONS ON ROBOTICS*
Morimoto, T. K., Okamura, A. M.
2016; 32 (6): 1419-1430
 - **Design of 3-D Printed Concentric Tube Robots.** *IEEE transactions on robotics : a publication of the IEEE Robotics and Automation Society*
Morimoto, T. K., Okamura, A. M.
2016; 32 (6): 1419-1430
 - **Stability and quantization-error analysis of haptic rendering of virtual stiffness and damping** *INTERNATIONAL JOURNAL OF ROBOTICS RESEARCH*
Colonnese, N., Okamura, A.
2016; 35 (9): 1103-1120
 - **Methods for Improving the Curvature of Steerable Needles in Biological Tissue** *IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING*
Adebar, T. K., Greer, J. D., Laeseke, P. F., Hwang, G. L., Okamura, A. M.
2016; 63 (6): 1167-1177
 - **Surgeon Design Interface for Patient-Specific Concentric Tube Robots.** *Proceedings of the ... IEEE/RAS-EMBS International Conference on Biomedical Robotics and Biomechanics. IEEE/RAS-EMBS International Conference on Biomedical Robotics and Biomechanics*
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