

Stanford



J Kenneth Salisbury, Jr.

Professor (Research) of Computer Science and of Surgery (Anatomy),
Emeritus

CONTACT INFORMATION

- **Alternate Contact**

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Bio

BIO

Salisbury worked on the development of the Stanford-JPL Robot Hand, the JPL Force Reflecting Hand Controller, the MIT-WAM arm, the PR-2 personal robot and the da Vinci Surgical Robot. His work with haptic interface technology led to the founding of SensAble Technology, producers of the PHANTOM haptic interface and software. He also worked on developing telerobotic systems for dexterity enhancement in the operating room. His current research focuses on minimalist force controllable robots, human-machine interaction, cooperative haptics, medical robotics, and surgical simulation.

ACADEMIC APPOINTMENTS

- Emeritus Faculty, Acad Council, Computer Science
- Member, Bio-X

PROFESSIONAL EDUCATION

- PhD, Stanford University , Mechanical Engineering (1982)
- MS, Stanford University , Mechanical Engineering (1977)
- BS, Stanford University , Electrical Engineering (1975)

Publications

PUBLICATIONS

- **Tactile-Reactive Roller Grasper** *IEEE TRANSACTIONS ON ROBOTICS*
Yuan, S., Wang, S., Patel, R., Tippur, M., Yako, C. L., Cutkosky, M. R., Adelson, E., Salisbury, J.
2025; 41: 1938-1955
- **Design and Control of Roller Grasper V3 for In-Hand Manipulation** *IEEE TRANSACTIONS ON ROBOTICS*
Yuan, S., Shao, L., Feng, Y., Sun, J., Xue, T., Yako, C. L., Bohg, J., Salisbury, J.
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- **Designing Underactuated Graspers with Dynamically Variable Geometry Using Potential Energy Map Based Analysis**
Yako, C. L., Yuan, S., Salisbury, J., IEEE
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- **Towards Human Haptic Gesture Interpretation for Robotic Systems**
Bianchini, B., Verma, P., Salisbury, J., IEEE
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- **Design and Control of Roller Grasper V2 for In-Hand Manipulation**
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IEEE.2020: 9151-9158
- **Design of a Roller-Based Dexterous Hand for Object Grasping and Within-Hand Manipulation**
Yuan, S., Epps, A. D., Nowak, J. B., Salisbury, J., IEEE
IEEE.2020: 8870-8876
- **Mechatronic design of an integrated robotic hand** *INTERNATIONAL JOURNAL OF ROBOTICS RESEARCH*
Quigley, M., Salisbury, C., Ng, A. Y., Salisbury, J. K.
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- **High-Fidelity, Inexpensive Surgical Middle Ear Simulator** *OTOLOGY & NEUROTOLOGY*
Monfared, A., Mitteramskogler, G., Gruber, S., Salisbury, J. K., Stampfl, J., Blevins, N. H.
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- **What You Can't Feel Won't Hurt You: Evaluating Haptic Hardware Using a Haptic Contrast Sensitivity Function** *IEEE TRANSACTIONS ON HAPTICS*
Salisbury, C. M., Gillespie, R. B., Tan, H. Z., Barbagli, F., Salisbury, J. K.
2011; 4 (2): 134-146
- **A Friction Differential and Cable Transmission Design for a 3-DOF Haptic Device with Spherical Kinematics** *IEEE/RSJ International Conference on Intelligent Robots and Systems*
Brewer, R., Leeper, A., Salisbury, J. K.
IEEE.2011
- **Demonstrating the Benefits of Variable Impedance to Telerobotic Task Execution** *IEEE International Conference on Robotics and Automation (ICRA)*
Walker, D. S., Salisbury, J. K., Niemeyer, G.
IEEE.2011: 1348-1353
- **A virtual surgical environment for rehearsal of tympanomastoidectomy.** *Studies in health technology and informatics*
Chan, S., Li, P., Lee, D. H., Salisbury, J. K., Blevins, N. H.
2011; 163: 112-118
- **In Vivo Micro-Image Mosaicing** *IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING*
Loewke, K. E., Camarillo, D. B., Piyawattanametha, W., Mandella, M. J., Contag, C. H., Thrun, S., Salisbury, J. K.
2011; 58 (1): 159-171
- **Visual Vein-Finding for Robotic IV Insertion** *IEEE International Conference on Robotics and Automation (ICRA)*
Brewer, R. D., Salisbury, J. K.
IEEE.2010: 4597-4602
- **Reconstruction and exploration of virtual middle-ear models derived from Micro-CT datasets.** *Hearing Res.*
Lee, D. H., Chan, S., Salisbury, C., Kim, N., Salisbury, K., Puria, S.
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- **Intelligent Road Sign Detection Using 3D Scene Geometry**
Schlosser, J., Montemerlo, M., Salisbury, K.
2010
- **Using Near-Field Stereo Vision for Robotic Grasping in Cluttered Environments**
Leeper, A., Hsiao, K., Chu, E., Salisbury, K.
2010
- **Laser Cutting Speeds Robotics Prototyping** *Product Design and Development*

Salisbury, K., Lee, S.
2010

- **Telerobotic System Concept for Real-Time Soft-Tissue Imaging During Radiotherapy Beam Delivery** *Med. Phys.*
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- **Multi-DOF Equalization of Haptic Devices for Accurate Rendering at High Frequencies** *IEEE/RSJ International Conference on Intelligent Robots and Systems*
Wilson, R. P., Chan, S., Salisbury, J. K., Niemeyer, G.
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- **Configuration Tracking for Continuum Manipulators With Coupled Tendon Drive** *IEEE TRANSACTIONS ON ROBOTICS*
Camarillo, D. B., Carlson, C. R., Salisbury, J. K.
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- **Task-Space Control of Continuum Manipulators with Coupled Tendon Drive** *11th International Symposium on Experimental Robotics (ISER)*
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- **Integration of Patient- Specific Paranasal Sinus Computed Tomographic Data Into a Virtual Surgical Environment** *American Journal of Rhinology & Allergy*
Parikh, Sachin, S., Chan, S., Agrawal, Sumit, K., Hwang, Peter, H., Salisbury, Curt, M., Rafii, Benjamin, Y.
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- **Effects of Haptic Device Attributes on Psychophysical Detection Thresholds of Sinusoidal Vibrations**
Salisbury, C., Gillespie, R., B., Tan, H., Barbagli, F., Kenneth, Salisbury, J.
2009
- **Effects of Haptic Device Attributes on Vibration Detection Thresholds** *3rd Joint EuroHaptics Conference Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*
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- **A Microsurgery-Specific Haptic Device for Telerobotic Medical Treatment**
Salisbury, C., Salisbury, K., Blevins, N., Gillespie, R.
2008
- **Voxel-Based Haptic Rendering Using Implicit Sphere Trees**
Ruffaldi, E., Morris, J., Barbagli, F., Salisbury, K., Bergamasco, M.
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- **Providing Metrics and Performance Feedback in a Surgical Simulator** *Computer Aided Surgery (2008)*
Sewell, C., Morris, D., Blevins, N., Dutta, S., Agrawal, S., Barbagli, F., Salisbury, J. K.
2008; 13 (2): 63–81
- **Real-Time Image Mosaicing with a Dual-Axes Confocal Microscope**
Loewke, K., Camarillo, D., Piyawattanametha, W., Salisbury, J., K.
2008
- **Automatic Preparation, Calibration, and Simulation of Deformable Objects** *Computer Methods in Biomechanics and Biomedical Engineering (Taylor & Francis Publishing)*

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- Morris, D., Salisbury, J. K.
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- **Force Control of a Permanent Magnet for Minimally-Invasive Procedures** *2nd Biennial IEEE RAS-EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob 2008)*
Brewer, R. D., Loewke, K. E., Duval, E. F., Salisbury, J. K.
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 - **Large workspace haptic devices - A new actuation approach** *16th Symposium on Haptics Interfaces for Virtual Environment and Teleoperator Systems*
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Camarillo, D. B., Loewke, K. E., Carlson, C. R., Salisbury, J. K.
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 - **Pushing using learned manipulation maps** *IEEE International Conference on Robotics and Automation*
Walker, S., Salisbury, J. K.
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 - **Difference-based Estimation of Support Friction** *IEEE/RSJ International Conference on Intelligent Robots and Systems*
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 - **Real-Time Image Mosaicing for Medical Applications** *15th Conference on Medicine Meets Virtual Reality*
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 - **An Optical Fiber Proximity Sensor for Haptic Exploration** *Robotics and Automation, 2007 IEEE International Conference on Robotics and Automation*
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- **Stability of haptic rendering: Discretization, quantization, time delay, and Coulomb effects** *IEEE International Conference on Robotics and Automation (ICRA)*
Diolaiti, N., Niemeyer, G., Barbagli, F., Salisbury, J. K.
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- **Visuohaptic Simulation of Bone Surgery for Training and Evaluation** *IEEE Computer Graphics and Applications*
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Tan, H., Z., Morris, D., Maurer, C., R., Antony, A., K., Barbagli, F., Salisbury, K.
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- **Isotropy and Visual Modulation of Haptic Force Direction Discrimination on the Human Finger**
Ho, C., Tan, H., Z., Barbagli, F., Salisbury, K., Spence, C.
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- **Haptically Annotated Movies: Reaching Out and Touching the Silver Screen**
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Frisoli, A., Barbagli, F., Ruffaldi, E., Salisbury, K., Bergamasco, M.
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- **The effect of quantization and Coulomb friction on the stability of haptic rendering** *1st Joint Eurohaptics Conference/Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*
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- **A Multirate Approach to Haptic Interaction with Deformable Objects Single and Multipoint Contacts**
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- **Multi-Point Interaction in Robotics and Virtual-Reality, Springer-Verlag in their STAR (Springer Tracts on Advanced Robotics) series**
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- **An event-driven framework for the simulation of complex surgical procedures** *7th International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI 2004)*
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2004
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Chun, K., Verplank, B., Barbagli, F., Salisbury, K.
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- **A Collaborative Virtual Environment for the Simulation of Temporal Bone Surgery**
Morris, D., Sewell, C., Blevins, N., Barbagli, F., Salisbury, K.
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- **Simulating Human Fingers: a Soft Finger Proxy Model and Algorithm**
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- **New Actuation Approach for Human-friendly Robot Design** *International Journal of Robotics Research*
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- **Training the Cognitive and Stylistic Aspects of Surgery Through Simulation**
Sewell, C., Morris, D., Blevins, N., Barbagli, F., Salisbury, K.
2004
- **Toward Virtual Manipulation: From One Point of Contact to Four** *Sensor Review (special issue on Haptic Devices)*
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- **A collaborative virtual environment for the simulation of temporal bone surgery** *7th International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI 2004)*
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- **A Collaborative Virtual Environment for the Simulation of Temporal Bone Surgery**
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- **Actuation methods for human-centered robotics and associated control challenges** *2nd International Workshop on Control Problems in Robotics and Automation*
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- **Dynamic Local Models for Stable Multi-Contact Haptic Interaction with Deformable Objects**
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- **Soft-Tissue Simulation Using the Radial Elements Method**
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- **Phantom-X**
Gretarsdottir, U., Barbagli, F., Salisbury, K.
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- **The Effect of Sensor/Actuator Asymmetries in Haptic Interfaces**
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- **Large Haptic Topographic Maps: MarsView and the Proxy Graph Algorithm**
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 - **The Intuitive Telesurgery System: Overview and Application**
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 - **Touching and Being Touched: Robot Hands, Arms and Haptic Interfaces**
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1999

- **Obstacle Negotiation in Robotic Excavation**

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- **Design and Clinical Experience with Teleoperated Minimally Invasive Surgical Robots**

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1997
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