

# Stephen A. Mascaró

## List of Publications

### Journal Publications

- Mascaró, S. and Asada, H., 2006. "The Common Patterns Of Blood Perfusion In The Fingernail Bed Subject To Fingertip Touch Force And Finger Posture," *Haptics-e: The Electronic Journal of Haptics Research*, vol. 4, no. 3, pp. 1-6.
- Mascaró, S. and Asada, H., 2004. "Measurement of Finger Posture and Three-Axis Fingertip Touch Force Using Fingernail Sensors," *IEEE Transactions on Robotics and Automation*, vol. 20, no. 1, pp. 26-35.
- Mascaró, S. and Asada, H., 2001. "Photoplethysmograph Fingernail Sensors for Measuring Finger Forces without Haptic Obstruction," *IEEE Transactions on Robotics and Automation*, vol. 17, no. 5, pp. 698-708.

### Refereed Conference Proceedings

- Sun, Y., Hollerbach, H. and Mascaró, S., "Finger Force Direction Recognition by Principal Component Analysis of Fingernail Coloration Pattern," Accepted for *Proc. of the 15<sup>th</sup> Int. Symp. on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, March 22-24, 2007.
- Sun, Y., Hollerbach, H. and Mascaró, S., "EigenNail for Finger Force Direction Recognition," Accepted for *Proc. of the IEEE International Conference on Robotics and Automation*, April 10-14, 2007.
- Flemming, L., and Mascaró, S. "Control of a Scalable Matrix Vasoconstriction Device for Wet Actuator Arrays," Accepted for *Proc. of the IEEE International Conference on Robotics and Automation*, April 10-14, 2007.
- Ertel, J., and Mascaró, S., "Thermomechanical Modeling of a Wet Shape Memory Alloy Actuator," Accepted for publication in *ASME IMECE Dynamic Systems and Control Division*, Nov. 5-10, 2006.
- Sun, Y., Hollerbach, H. and Mascaró, S., 2006. "Dynamic Features and Prediction Model for Imaging Fingernail to Measure Finger Forces," *Proc. of IEEE International Conference on Robotics and Automation*, pp. 2813-2818.
- Sun, Y., Hollerbach, H. and Mascaró, S., 2006. "Measuring Fingertip Forces by Imaging the Fingernail," *Proc. of 14th Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, pp. 125-131.
- Flemming, L. and Mascaró, S., 2005. "Wet SMA Muscle Array with Matrix Vasoconstrictive Control," *Proc. of ASME Dynamic Systems and Control Division*, vol. 74, no. 2, pp. 1751-1758.
- Flemming, L. and Mascaró, S., 2005. "Control of Scalable Wet SMA Actuator Arrays," *Proc. of IEEE International Conference on Robotics and Automation*, pp. 1350-1355.
- Cho, K.-J., Roy, B.; Mascaró, S., and Asada, H.H., 2004. "A Vast DOF Robotic Car Seat Using SMA Actuators with a Matrix Drive System," *Proc. IEEE International Conference on Robotics and Automation*, vol. 4, pp. 3647-3652.
- Mascaró, S. and Asada, H., 2003. "Vast DOF Wet Shape Memory Alloy Actuators Using Matrix Manifold and Valve System," *Proc. ASME Dynamic Systems and Control Division*, vol. 72, no. 1, pp. 577-582.

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- Mascaró, S., Cho, K., and Asada, H., 2003. "Design and Control of Vast DOF Wet SMA Array Actuators," *Proc. IEEE/RSJ International Conference on Intelligent Robots and Systems*, vol. 2, pp. 1992-1997.
- Mascaró, S. and Asada, H., 2003. "Wet Shape Memory Alloy Actuators for Active Vasculated Robotic Flesh," *Proc. IEEE International Conference on Robotics and Automation*, vol. 1, pp. 282-287. **Finalist for the Best Conference Paper Award.**
- Mascaró, S. and Asada, H., 2002. "Filter Design and Calibration for Fingernail Sensors to Measure Fingertip Forces and Finger Posture," *Proc. IEEE International Conference on Robotics and Automation*, vol. 2, pp. 1642-1648.
- Mascaró, S. and Asada, H., 2002. "Understanding of Fingernail-Bone Interaction and Fingertip Hemodynamics for Fingernail Sensor Design," *Proc. 10<sup>th</sup> Int. Symp. on Haptic Interfaces for Virtual Environment and Teleoperator Systems*, pp. 106 -113.
- Mascaró, S. and Asada, H., 2001. "Finger Posture and Shear Force Measurement using Fingernail Sensors: Initial Experimentation," *Proc. IEEE Int. Conf. Robotics and Automation*, vol. 2, pp. 1857-1862.
- Mascaró, S. and Asada, H., 2000. "Fingernail Sensors for Measurement of Fingertip Touch Force and Finger Posture," *Proc. ASME Dynamic Systems and Control Division*, vol. 69-2, pp. 1249-1250.
- Mascaró, S. and Asada, H., 2000. "Fingernail Touch Sensors: Spatially Distributed Measurement and Hemodynamic Modeling," *Proc. IEEE Int. Conf. Robotics and Automation*, vol. 4, pp. 3422-3427.
- Mascaró, S. and Asada, H., 1999. "Distributed Photo-Plethysmograph Fingernail Sensors: Finger Force Measurement Without Haptic Obstruction," *Proc. ASME Dynamic Systems and Control Division*, vol. 67, pp. 73-80.
- Mascaró, S., Chang, K.-W. and Asada, H., 1999. "Photo-Plethysmograph Nail Sensors for Measuring Finger Forces Without Haptic Obstruction," *Proc. IEEE Int. Conf. Robotics and Automation*, vol. 2, pp. 962-967. **Winner of the Best Conference Paper Award.**
- Mascaró, S. and Asada, H., 1999. "Virtual Switch Human-Machine Interface Using Fingernail Touch Sensors," *Proc. IEEE Int. Conf. Robotics and Automation*, vol. 4, pp. 2533-2538.
- Mascaró, S., Chang, K.-W., and Asada, H., 1998. "Finger Touch Sensors Using Instrumented Nails and Their Application To Human-Robot Interactive Control," *Proc. ASME Dynamic Systems and Control Division*, vol. 64, pp. 91-96.
- Mascaró, S., Chang, K.-W., and Asada, H., 1998. "Instrumented Fingernails: a Haptically Unobstructive Method for Touch Force Input," *Proc. SPIE Telemanipulator and Telepresence Technologies V*, vol. 3524, pp. 170-178.
- Mascaró, S. and Asada, H., 1998. "Hand-in-Glove Human-Machine Interface and Interactive Control: Task Process Modeling Using Dual Petri Nets," *Proc. IEEE Int. Conf. Robotics and Automation*, vol. 2, pp. 1289-1295.
- Mascaró, S. and Asada, H., 1998. "Docking Control of Holonomic Omnidirectional Vehicles with Applications to a Hybrid Wheelchair/Bed System," *Proc. IEEE Int. Conf. Robotics and Automation*, vol. 1, pp. 399-405.

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- Mascaro, S., and Asada, H., 1997. "A Hybrid Bed/Chair System for Bedridden Patients - Elimination of Transfer Between a Bed and Wheelchair," *Proc. ASME Dynamic Systems and Control Division*, vol. 61, pp. 393-400.
- Mascaro, S., Spano, J. and Asada, H., 1997. "A Reconfigurable Holonomic Omnidirectional Mobile Bed with Unified Seating (RHOMBUS) for Bedridden Patients," *Proc. IEEE Int. Conf. Robotics and Automation*, vol. 2, pp. 1277-1282.

### Patents

- Sun, Y., Hollerbach, J., and Mascaro, S. "Device And Method Of Detecting A Force Applied To A Finger," US Provisional Application No. 60/787,996, Filed March 31, 2006.
- Asada, H.H. and Mascaro, S., 2002. "Fingernail Sensors for Measuring Finger Forces and Finger Posture," US Patent 6,388,247, Issued May 14, 2002.
- Asada, H.H., Mascaro, S., and Chang, K.-W., 2001. "Finger Touch Sensors and Virtual Switch Panels," US Patent 6,236,037, Issued May 22, 2001.
- Asada, H.H., Mascaro, S., and Spano, J., 2000. "Human Transport System with Dead Reckoning Facilitating Docking," US Patent 6,135,228, Issued October 24, 2000.

### Theses:

- Mascaro, S., 2002, "Design and Analysis of Fingernail Sensors for Measurement of Fingertip Touch Force and Finger Posture," Ph.D. Thesis, Massachusetts Institute of Technology.
- Mascaro, S, 1997. "Force Guided Docking Control of an Omnidirectional Holonomic Vehicle and its Application to Wheelchairs," M.S. Thesis, Massachusetts Institute of Technology.