

# Seok Chang Ryu, Ph.D.

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## EDUCATION

- Ph.D. Stanford University**, Stanford, CA, USA Jan 2013  
Dept. of Mechanical Engineering (Advisor: Prof. Mark R Cutkosky)  
Dissertation: "Optically controlled magnetic resonance imaging compatible active needle"
- M.S. Stanford University**, Stanford, CA, USA Jun 2007  
Dept. of Mechanical Engineering (Advisor: Prof. Mark R Cutkosky)
- B.S. Pohang University of Science and Technology**, Pohang, Korea Feb 2002  
Dept. of Mechanical Engineering

## EMPLOYMENT

- Assistant Professor** Sep 2015 - Present  
Dept. of Mechanical Engineering, Texas A&M University, College Station, TX
- Consultant** Nov 2014 - Apr 2015  
Intelligent Fiber Optic Systems ([www.ifos.com](http://www.ifos.com)), Santa Clara, CA
- Postdoctoral Research Fellow** Feb 2013 - Jun 2015  
Dept. of Surgery, Harvard Medical School, Boston, MA  
Dept. of Cardiovascular Surgery, Boston Children's Hospital, Boston, MA  
(Advisor: Prof. Pierre E Dupont)
- Research Scientist** Oct 2004 - Jul 2005  
BioNano Robotics Laboratory, Microsystems Research Center  
Korea Institute of Science and Technology (KIST), Seoul, Korea
- Research Engineer** Jan 2002 - Jun 2004  
Robostar Co. Ltd. (<http://www.robostar.co.kr>), Anyang, Korea

## AWARDS, HONORS AND SCHOLARSHIPS

- Best Medical Robotics Paper Award Finalist in IEEE ICRA 2014** Jun 2014  
S. C. Ryu and P. E. Dupont, "FBG-based Shape Sensing Tubes for Continuum Robots", The 2014 IEEE International Conference on Robotics and Automation (ICRA)
- Paper Invitation to IEEE Transactions on Robotics** May 2012  
based on the "topic and excellent review score" of the IEEE ICRA 2012 Paper, by Editor-in-Chief
- Graduate Study-Abroad Scholarship** Sep 2005 - Aug 2007  
Korea Research Foundation (KRF), Seoul, Korea
- Undergraduate Honor Scholarship** Mar 1998 - Jun 2001  
Pohang University of Science and Technology, Pohang, Korea

## PUBLICATIONS

### Dissertation

1. **S. C. Ryu**, "Optically controlled magnetic resonance imaging compatible active needle", Ph.D. Dissertation, Mechanical Engineering, Stanford University, Jan 2013.

### Journal Articles

1. **S. C. Ryu**, Jesung Ko, Z. F. Quek, P. Renaud, R. J. Black, B. L. Daniel, Kyu-Jin Cho, M. R. Cutkosky, "Design of an Optically Controlled MR-compatible Active Needle," *IEEE Transactions on Robotics*, **31**(1), 1-11, 2015 (**Invited by Editor-in-Chief**)
2. YL Park, S. Elayaperumal, B. L. Daniel, **S. C. Ryu**, M. Shin, J. Savall, R. J. Black, B. Moslehi and M. R. Cutkosky, "Real-Time Estimation of Three-Dimensional Needle Shape and Deflection for MRI-Guided Interventions," *IEEE/ASME Transactions on Mechatronics*, **15**(6), 906-915, 2010
3. YL Park, **S. C. Ryu**, R. J. Black, K. Chau, B. Moslehi and M. R. Cutkosky, "Exoskeletal Force-Sensing End-Effectors With Embedded Optical Fiber-Bragg-Grating Sensors," *IEEE Transactions on Robotics* **25**(6), 1319-1331, 2009
4. J. Kim, J. Park, J. M. Cha, **S. C. Ryu**, S. K. Ryu, S. Park, B. Kim, J. Cha, H. C. Kim and K. Chun, "The dependence of contractile force for the cardiomyocytes on a different engineered surface," *IEEE Sensors*, 2005

### Peer-reviewed Conference Proceedings (Full-length papers)

1. C. Kim, **S. C. Ryu**, and P. E. Dupont, "Real-time Adaptive Kinematic Model Estimation of Concentric Tube Robot", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2015
2. **S. C. Ryu** and P. E. Dupont, "FBG-based Shape Sensing Tubes for Continuum Robots", *IEEE International Conference Robotics and Automation (ICRA)*, 2014 (**Best Medical Robotics Paper Award Finalist**)
3. R. J. Black, **S. C. Ryu**, B. Moslehi and J. M. Costa, "Characterization of optically actuated MRI-compatible active needles for medical interventions," *Proc. SPIE 9058, Behavior and Mechanics of Multifunctional Materials and Composites 2014*
4. **S. C. Ryu**, Z. F. Quek, P. Renaud, R. J. Black, B. L. Daniel and M. R. Cutkosky, "An Optical Actuation System and Curvature Sensor for a MR-compatible Active Needle," *IEEE International Conference Robotics and Automation (ICRA)*, 2012
5. **S. C. Ryu**, P. Renaud, R. J. Black, B. L. Daniel and M. R. Cutkosky, "Feasibility Study of an Optically Actuated MR-compatible Active Needle," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2011
6. YL Park, **S. C. Ryu**, R. J. Black, B. Moslehi and M. R. Cutkosky, "Fingertip force control with embedded fiber Bragg grating sensors," *IEEE International Conference on Robotics and Automation (ICRA)*, 2008
7. **S. C. Ryu**, B. Kim, D. Kim and S. Park, "Comparative Quantification of Contractile Force of Cardiac Muscle Using a Micro-mechanical Cell Force Measurement System," *2005 IEEE Engineering in Medicine and Biology 27th Annual Conference*, 2005
8. S. Park, **S. C. Ryu**, D. Kim and B. Kim, "Contractile Force Measurements of Cardiac Myocytes Using a Micro-manipulation System," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2005