

Sungwook Yang, Ph.D.

Senior Research Scientist

**Center for Intelligent & Interactive Robotics, AI · Robot Institute
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RESEARCH INTERESTS

- Novel Robotic Platforms for Biomedical Applications
- Surgical Robotics
- Biomedical Robotics
- Neurorobotics

EDUCATION

- Ph. D.** Robotics Institute, **Carnegie Mellon University**, Pittsburgh, U.S.A. **May 2015**
- Advisor: Prof. Cameron N. Riviere
- Dissertation: *Handheld Micromanipulator for Robot-Assisted Microsurgery*
- M.S.** Mechanical and Aerospace Engineering, **Seoul National University**, Seoul, Korea **Feb. 2006**
- Advisor: Prof. Heui Jae Pahk
- Thesis: *Study on Measurement of Thickness and Chromaticity for Transparent Thin Film*
- B.S.** Mechanical and Aerospace Engineering, **Seoul National University**, Seoul, Korea **Feb. 2004**
- An early gradation with cum laude

EMPLOYMENT

- Senior Research Scientist** Center for Intelligent and Interactive Robotics, **Jan. 2019 ~ Present**
Robot and Media Institute,
Korea Institute of Science and Technology, Seoul, Korea.
- Senior Research Scientist** Center for BioMicrosystem, Brain Science Institute, **Mar. 2016 ~ Dec. 2018**
Korea Institute of Science and Technology, Seoul, Korea.
- Research Scientist** Korea Institute of Science and Technology, Seoul, Korea. **Mar. 2006 ~ Feb. 2016**
- Assistant Professor** HCI and Robotics, **Mar. 2016 ~ Feb. 2018**
University of Science and Technology, Seoul, Korea.

TRAINING

- Center for Neural Communication Technology Summer Workshop, Michigan, USA **May. 11 ~ 16, 2009**
- Implantable Neuroprosthetics: Technologies and Techniques
- Director: Prof. Daryl R. Kipke
- Korean Physiome Society Workshop, Seoul, Korea **Feb. 16 ~ 18, 2009**
- Human Physiology for Scientists and Engineers
- Director: Prof. Eun Bo Shim

AWARDS AND HONORS

Best Paper Award, Korea Society of Mechanical Engineers	Apr. 2017
Best Paper Award, IEEE/ASME Transactions on Mechatronics (TMECH)	Jul. 2016
Outstanding Young Scientist Award, Korea Robotics Society	Oct. 2015
Best Application Paper Award, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS2014)	Sep. 2014
Scholarship for Honor Graduate Student, Kwanjeong Educational Foundation	Aug. 2010 ~ May 2015
Best Paper Award, Korea Society of Mechanical Engineers	Nov. 2009
Best Paper Award, Korea Society of Mechanical Engineers	Nov. 2008
Best Research Team Award, Korea Institute of Science and Technology	Feb. 2008
Full Scholarship for Honor Graduate Research Assistant, SNU Precision Co., Ltd.	Mar. 2005
An Early Gradation with Cum Laude, Seoul National University	Feb. 2004
Best Presentation Award, School of Mechanical Aerospace Engineering, Seoul National University	Dec. 2003
Scholarship for Honor Student, Seoul National University	Sep. 2000 ~ Sep. 2004

ACTIVITIES

Editorial Director	Korea Society of Mechanical Engineers, Bio Engineering Division,	2016 ~ Present
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SOCIETY MEMBERSHIPS

IEEE Robotics and Automation Society	2009 ~ Present
IEEE Engineering in Medicine and Biology Society	2008 ~ Present
Society for Neuroscience	2008 ~ Present
The Korean Society of Mechanical Engineers	2008 ~ Present
The Korean Society of Medical & Biological and Engineering	2017 ~ Present

SELECTED PUBLICATIONS (SINCE 2010)

- D. Yoon, E. Kim, I. Choi, S. W. Han, **S. Yang**, “Prediction of voluntary motion using decomposition-and-ensemble framework with deep neural networks,” *IEEE Access*, vol.8, pp. 201555-201565, 2020.
- M. Jang, J. S. Kim, S. H. Um, **S. Yang (Co-Corr.)**, J. Kim, “Ultra-high curvature sensors for multi-bend structures using fiber Bragg gratings”, *Opt. Express*, vol. 27, no. 3, pp. 2074-2084, 2019.
- **S. Yang**, J. N. Martel, L. A. Lobes Jr., and C. N. Riviere, “Techniques for robot-aided intraocular surgery using monocular vision”, *Int. J. Robot. Res.*, vol. 37, no. 8, pp. 931-952, 2018.
- D. Braun, **S. Yang**, J. N. Martel, C. N. Riviere, and B. C. Becker, “EyeSLAM: Real-time simultaneous localization and mapping of retinal vessels during intraocular microsurgery,” *Int. J. Med. Robot. Comput. Assist. Surg.*, vol. 14, no. 1, e1848, 2018.
- S. Mukherjee, **S. Yang**, R. A. MacLachlan, L. A. Lobes Jr., J. N. Martel, and C. N. Riviere, “Toward monocular camera-guided retinal vein cannulation with an actively stabilized handheld robot,” in *Proc. IEEE Int. Conf. Robot. Autom. (ICRA)*, 2017, pp. 2951-2956.
- **S. Yang**, R. A. MacLachlan, J. N. Martel, L. A. Lobes Jr., and C. N. Riviere, “Comparative evaluation of handheld robot-aided intraocular laser surgery,” *IEEE Trans. Robot.*, vol. 32, no. 1, pp. 246-251, 2016.
- T. Wells, **S. Yang**, R. A. MacLachlan, L. A. Louis Jr., J. N. Martel, and C. N. Riviere, “Hybrid position/force control of an active handheld micromanipulator for membrane peeling,” *Int. J. Med. Robot. Comput. Assist. Surg.*, vol. 12 no. 1, pp. 85-95, 2016.
- **S. Yang**, L. A. Lobes Jr., J. N. Martel, and C. N. Riviere, “Handheld automated microsurgical instrumentation for intraocular laser surgery,” *Lasers Surg. Med.*, vol. 47, no. 8, pp. 658-668, 2015.
- **S. Yang**, R. A. MacLachlan, and C. N. Riviere, “Manipulator design and operation for a six-degree-of-freedom handheld tremor-canceling microsurgical instrument,” *IEEE /ASME Trans. Mechatronics*, vol. 20, no. 2, pp. 761–772, 2015. (**Awarded for TMECH 2016 Best Paper**)
- **S. Yang**, R. A. MacLachlan, and C. N. Riviere, “Toward automated intraocular laser surgery using a handheld micromanipulator,” in *Proc. IEEE/RSJ Int. Conf. Intell. Robot. Syst. (IROS)*, 2014, pp. 1302–1307. (**Awarded for Best Application Paper**)
- **S. Yang**, T. S. Wells, R. A. MacLachlan, and C. N. Riviere, “Performance of a 6-degree-of-freedom active microsurgical manipulator in handheld tasks,” in *Proc. 35th Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. (EMBC)*, 2013, pp. 5670–5673.
- **S. Yang**, M. Balicki, T. S. Wells, R. A. MacLachlan, X. Liu, J. U. Kang, J. T. Handa, R. H. Taylor, C. N. Riviere, “Improvement of optical coherence tomography using active handheld micromanipulator in vitreoretinal surgery,” in *Proc. 35th Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. (EMBC)*, 2013, pp. 5674–5677.
- **S. Yang**, M. Balicki, R. A. MacLachlan, X. L. Liu, J. U. Kang, R. H. Taylor, and C. N. Riviere, “Optical coherence tomography scanning with a handheld vitreoretinal micromanipulator,” in *Proc. 34th Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. (EMBC)*, 2012, pp. 948–951.
- **S. Yang**, R. A. MacLachlan, and C. N. Riviere, “Design and analysis of 6 DOF handheld micromanipulator,” in *Proc. IEEE Int. Conf. Robot. Autom. (ICRA)*, 2012, pp. 1946–1951.
- **S. Yang**, S. Lee, K. Park, J. Kim, Y. Huh, E. S. Yoon, and H. S. Shin, “Feedback controlled piezo-motor microdrive for accurate electrode positioning in chronic single unit recording in behaving mice,” *J. Neurosci. Methods*, vol. 195, no. 2, pp. 117–127, 2011.
- H. M. Kim, **S. Yang (co-first author)**, J. Kim, S. Park, J. H. Cho, J. Y. Park, T. S. Kim, E. S. Yoon, S. Y. Song, and S. Bang, “Active locomotion of a paddling-based capsule endoscope in an in vitro and in vivo experiment,” *Gastrointest. Endosc.*, vol. 72, no. 2, pp. 381–387, 2010. (**Cover article**)
- **S. Yang**, S. Lee, K. Park, J. Kim, J. Cho, H. S. Shin, and E. S. Yoon, “Highly-accurate, implantable micromanipulator for single neuron recordings,” in *Proc. IEEE Int. Conf. Robot. Autom. (ICRA)*, 2010, pp. 5070-5075.

PATENTS

- **S. Yang**, J. Lee, J. Kim, D. Hwang, I. Y. S. Ihn, "**Robot palm**," KR2020-0163751 (application)
- D. Hwang, S. Park, N. Jang, Y. S. Ihn, **S. Yang**, J. Jeong, S. Yim, S. -R. Oh, "**Tele-operated Forceps-driver Variable Stiffness Master Device**," KR2020-0015706 (application), US17/029286(application).
- D. Hwang, S. Park, N. Jang, Y. S. Ihn, J. Jeong, K. Kim, S. -R. Oh, **S. Yang**, S. Yim, "**Forceps Driver Apparatus**," KR2020-0163751.
- D. Hwang, N. Jang, Y. S. Ihn, **S. Yang**, J. Jeong, S. Yim, K. Kim, S. -R. Oh, "**Peripheral Nerve Gripping Apparatus**," KR10-2174354 (grant).
- J. Kim, **S. Yang**, M. S. Jang, J. S. Kim, K. Kang, B. J. You, "**FBG-based torsion sensor device**," KR10-2136625 (grant), PCT/KR/2019008493.
- **S. Yang**, E. S. Yoon, R. Hoon, and H. Im, "**Supporting structure applying gravity compensation mechanism and impact control system having the supporting structure**," KR10-1991414 (grant), US16/385244 (application).
- **S. Yang**, E. S. Yoon, R. Hoon, and H. Im, "**Quantitative impact control and measurement system**," KR10-2059119 (grant), US16/199741 (application)
- J. S. Kim, H. J. Shin, B. J. You, **S. Yang**, "**Motion capture system using a FBG sensor**," KR10-1862131 (grant), US10524701 (grant).
- E. S. Yoon, **S. Yang**, J. Kim, D. M. Rho, J. Cho, and H.S. Shin, "**Multi-selective micro manipulator**," US8707809 (grant), EP2493665 (grant), KR10-1091610 (grant).
- E. S. Yoon, **S. Yang**, J. Kim, D. M. Rho, K. Park, S. Lee, J. Cho, and H.S. Shin, "**Micro manipulator for electrode movement in neural signal recording**," US8435250 (grant), KR10-1017908 (grant).
- S. H. Park, J. Kim, J. Hong, **S. Yang**, H. S. Shin, D. W. Lee, S. C. Lee, and H. S. Kim, "**Polymer linear actuator for micro electro mechanical system and micro manipulator for measurement device of cranial nerve signal using the same**," US7917200 (grant), US8774910 (grant), EP1840080 (grant), KR10-0767723 (grant).
- E. S. Yoon, **S. Yang**, J. Kim, K. Na, and D. M. Rho, "**Bidirectional moving micro-robot system**," US8322469 (grant), KR10-1135597 (grant), EP2542389 (grant).
- E. S. Yoon, **S. Yang**, J. Kim, K. Na, D. M. Rho, and S. S. Lee, "**Capsule type micro-robot bidirectional moving system**," KR10-1074511 (grant), EP2498664 (grant).
- E. S. Yoon, J. Kim, **S. Yang**, K. Na, and S. Park, "**Steering module and robot system using the same**," KR10-1012034 (grant).
- E. S. Yoon, **S. Yang**, J. Kim, K. Na, D. M. Rho, D. E. Kim, and Y. T. Kim, "**End structure for minimizing tissue damage by contacting internal organs**," KR10-1070275 (grant).
- E. S. Yoon, J. Kim, **S. Yang**, K. Na, K. Y. Suh, and S. H. Lee, "**Polymeric microstructure and manufacturing method useful for a foot of in-vivo moving robot**," KR 10-0997650 (grant).
- E. S. Yoon, J. Kim, **S. Yang**, D. E. Kim, and Y. T. Kim, "**Multi-fiber frictional surface mechanism for the moving system inside living organism**," KR 10-087391 (grant).

PUBLICATIONS

• Journals

- [1] D. Yoon, E. Kim, I. Choi, S. W. Han, **S. Yang**, "Prediction of voluntary motion using decomposition-and-ensemble framework with deep neural networks," *IEEE Access*, vol.8, pp. 201555-201565, 2020.
- [2] N. Jang, Y. S. Ihn, N. Choi, G. Gu, J. Jeong, **S. Yang**, S. Yim, K. Kim, S. -R. Oh, D. Hwang, "Compact and lightweight end-effectors to drive hand-operated surgical instruments for robot-assisted microsurgery," *IEEE /ASME Trans. Mechatronics*, vol. 25, no. 4, pp. 1933-1943, 2020.
- [3] S. Park, N. Jang, Y. S. Ihn, **S. Yang**, J. Jeong, S. Yim, S. -R. Oh, K. Kim, D. Hwang, "A tele-operated microsurgical forceps-driver with a variable stiffness haptic feedback master device," *IEEE Robotics and Automation Letters*, vol. 5, no. 2, pp. 1946-1953, 2020.
- [4] P. Pendyala, H. N. Kim, H. S. Grewal, U. Chae, **S. Yang**, I. -J. Cho, S. Song, E. -S. Yoon, "Internal-Flow-Mediated, Tunable One-dimensional Cassie-to-Wenzel Wetting Transition on Superhydrophobic Microcavity Surfaces during Evaporation," *Nanoscale and Microscale Thermophysical Engineering*, vol. 23, no. 4, pp. 275-288, 2019.
- [5] M. Jang, J. S. Kim, S. H. Um, **S. Yang (Co-Corr.)**, J. Kim, "Ultra-high curvature sensors for multi-bend structures using fiber Bragg gratings", *Opt. Express*, vol. 27, no. 3, pp. 2074-2084, 2019.
- [6] **S. Yang**, J. N. Martel, L. A. Lobes Jr., and C. N. Riviere, "Techniques for robot-aided intraocular surgery using monocular vision", *Int. J. Robot. Res.*, vol. 37, no. 8, pp. 931-952, 2018.
- [7] D. Braun, **S. Yang**, J. N. Martel, C. N. Riviere, and B. C. Becker, "EyeSLAM: Real-time simultaneous localization and mapping of retinal vessels during intraocular microsurgery," *Int. J. Med. Robot. Comput. Assist. Surg.*, vol. 14, no. 1, e1848, 2018.
- [8] **S. Yang**, R. A. MacLachlan, J. N. Martel, L. A. Lobes Jr., and C. N. Riviere, "Comparative evaluation of handheld robot-aided intraocular laser surgery," *IEEE Trans. Robot.*, vol. 32, no. 1, pp. 246-251, 2016.
- [9] T. Wells, **S. Yang**, R. A. MacLachlan, L. A. Louis Jr., J. N. Martel, and C. N. Riviere, "Hybrid position/force control of an active handheld micromanipulator for membrane peeling," *Int. J. Med. Robot. Comput. Assist. Surg.*, vol. 12 no. 1, pp. 85-95, 2016.
- [10] **S. Yang**, L. A. Lobes Jr., J. N. Martel, and C. N. Riviere, "Handheld automated microsurgical instrumentation for intraocular laser surgery," *Lasers Surg. Med.*, vol. 47, no. 8, pp. 658-668, 2015.
- [11] **S. Yang**, R. A. MacLachlan, and C. N. Riviere, "Manipulator design and operation for a six-degree-of-freedom handheld tremor-canceling microsurgical instrument," *IEEE /ASME Trans. Mechatronics*, vol. 20, no. 2, pp. 761-772, 2015. (**Best Paper Award**)
- [12] Y. T. Kim, D. E. Kim, **S. Yang**, and E. S. Yoon, "Design of endoscopic micro-robotic end effectors: safety and performance evaluation based on physical intestinal tissue damage characteristics," *Biomed. Microdevices*, vol. 16, no. 3, pp. 397-413, 2014.
- [13] **S. Yang**, S. Lee, K. Park, J. Kim, Y. Huh, E. S. Yoon, and H. S. Shin, "Feedback controlled piezo-motor microdrive for accurate electrode positioning in chronic single unit recording in behaving mice," *J. Neurosci. Methods*, vol. 195, no. 2, pp. 117-127, 2011.
- [14] D. C. Pham, K. Na, S. Piao, **S. Yang**, J. Kim, and E. S. Yoon, "Hydrophobicity and micro-/nanotribological properties of polymeric nanolines," *Surf. Eng.*, vol. 27, no. 4, pp. 268-293, 2011.
- [15] H. M. Kim, **S. Yang (co-first author)**, J. Kim, S. Park, J. H. Cho, J. Y. Park, T. S. Kim, E. S. Yoon, S. Y. Song, and S. Bang, "Active locomotion of a paddling-based capsule endoscope in an in vitro and in vivo experiment," *Gastrointest. Endosc.*, vol. 72, no. 2, pp. 381-387, 2010. (**Cover article**)
- [16] S. H. Lee, Y. Tae. Kim, **S. Yang**, E. S. Yoon, D. E. Kim, and K. Y. Suh, "An optimal micropatterned end-effector for enhancing frictional force on large intestinal surface," *ACS Appl. Mater. Inter.*, vol. 2, no. 5, pp. 1308-1316, 2010.
- [17] T. H. Nguyen, S. M. Lee, K. Na, **S. Yang**, J. Kim, and E. S. Yoon, "An improved measurement of dsDNA elasticity using AFM," *Nanotechnology*, vol. 21, pp. 075101-1-075101-7, 2010.
- [18] D. C. Pham, K. Na, **S. Yang**, J. Kim, E. S. Yoon, "Nanotribological properties of silicon nano-pillars coated by a Z-DOL lubricating film," *J. Mech. Sci. Technol.*, vol. 24, pp. 59-65, 2010.
- [19] **S. Yang**, K. Park, S. S. Lee, K. Na, J. Kim, J. Choi, S. H. Park, J. Park, and E. S. Yoon, "Locomotive microrobot for capsule endoscopes", *J. Korea Robot. Soc.*, vol. 4, no. 1, pp. 62-67, 2009.
- [20] D. C. Pham, K. Na, **S. Yang**, J. Kim, E. S. Yoon, "Microtribological properties of topographically-modified polymeric surfaces with different pitches," *J. Korean Phys. Soc.*, 55(4): 1416-1424, 2009.
- [21] R. A. Singh, D. C. Pham, J. Kim, **S. Yang**, and E. S. Yoon, "Bio-inspired dual surface modification to improve tribological properties at small-scale," *Appl. Surf. Sci.*, vol. 255, pp. 4821-4828, 2009.

Curriculum Vitae Sungwook Yang, Ph. D.

- [22] J. Kim, J. Park, K. Na, **S. Yang**, J. Baek, E. S. Yoon, S. Choi, S. Lee, K. Chun, J. Park, and S. Park, "Quantitative evaluation of cardiomyocyte contractility in a 3D microenvironment," *J. Biomech.*, vol. 41, pp. 2396–2401, 2008.
- [23] R. A. Singh, J. Kim, **S. Yang**, J. E. Oh, and E. S. Yoon, "Tribological properties of trichlorosilane-based one- and two-component self-assembled monolayers," *Wear*, vol. 265, pp. 42-48, 2008.
- [24] J. Kim, **S. Yang**, E. S. Yoon, "Measurement of mechanical properties of cardiomyocytes using microfabricated structures," *J. Korean Soc. Precis. Eng.*, vol. 25, no. 2, pp. 15–22, 2008.
- [25] J. Kim, J. Park, **S. Yang**, J. Baek, B. Kim, S. H. Lee, E. S. Yoon, K. Chun, and S. Park, "Establishment of a fabrication method for a long-term actuated hybrid cell robot," *Lab Chip*, vol. 7, pp. 1504–1508, 2007.
- [26] R. A. Singh, H. J. Kim, J. Kim, **S. Yang**, H. E. Jeong, K. Y. Suh, and E. S. Yoon, "A biomimetic approach for effective reduction in micro-scale friction by direct replication of topography of natural water-repellent surfaces," *J. Mech. Sci. Techno.*, vol. 21, no. 4, pp. 624–629, 2007.

- **Presentations and Conference Proceeding**

- **International**

- [1] S. Yim, J. Jeong, Y. Ihn, D. Hwang, **S. Yang**, S. -R. Oh, K. Kim, "One-step Implantation of a 3D Neural Microelectrode Array," in *Proc. 42nd Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. (EMBC) 2020*, pp. 3379-3383.
- [2] N. Jang, Y. S. Ihn, J. Jeong, **S. Yang**, S. Yim, S.-R. Oh, K. Kim, and D. Hwang, "A Miniature Suction-gripper with Passive and Active Microneedle," in *Proc. IEEE Int. Conf. Robot. Autom. (ICRA)*, 2019, pp. 9202-2958.
- [3] Kim, K. Jang, S. H. UM, **S. Yang**, and J. Kim, "Development of Wearable Motion Capture System Using Fiber Bragg Grating Sensors for Measuring Arm Motion" in *Proc. Int. Conf. IEEE Virt. Real. 3D User Interf. (VR) 2019*.
- [4] M. Jang, J. S. Kim, K. Jang, S. H. UM, **S. Yang**, and J. Kim, "Development of Wearable Motion Capture System Using Fiber Bragg Grating Sensors for Measuring Arm Motion" in *Proc. Int. Conf. IEEE Virt. Real. 3D User Interf. (VR) 2019*.
- [5] M. Jang, J. S. Kim, K. Jang, J. Kim, and **S. Yang**, "Towards Finger Motion Capture System Using FBG Sensors," in *Proc. 40th Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. (EMBC) 2018*.
- [6] M. Jang, O. Kim, **S. Yang**, and J. Kim, "High bending curvature withstanding one dimensional angle sensor with fiber Bragg gratings," in *Proc. IEEE Int. Conf. Optic. Fiber Sensor.*, 2017.
- [7] S. Mukherjee, **S. Yang**, R. A. MacLachlan, L. A. Lobes Jr., J. N. Martel, and C. N. Riviere, "Toward monocular camera-guided retinal vein cannulation with an actively stabilized handheld robot," in *Proc. IEEE Int. Conf. Robot. Autom. (ICRA)*, 2017, pp. 2951-2956.
- [8] **S. Yang**, R. A. MacLachlan, and C. N. Riviere, "Toward automated intraocular laser surgery using a handheld micromanipulator," in *Proc. IEEE/RSJ Int. Conf. Intell. Robot. Syst. (IROS)*, 2014, pp. 1302-1307. (**Best Application Paper Award**)
- [9] T. S. Wells, **S. Yang**, R. A. MacLachlan, J. T. Handa, P. Gehlbach, and C. N. Riviere, "Comparison of baseline tremor under various microsurgical conditions," in *Proc. IEEE Int. Conf. Syst. Man Cybern. (SMC)*, 2013, pp. 1482-1487.
- [10] **S. Yang**, T. S. Wells, R. A. MacLachlan, and C. N. Riviere, "Performance of a 6-degree-of-freedom active microsurgical manipulator in handheld tasks," in *Proc. 35th Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. (EMBC)*, 2013, pp. 5670-5673.
- [11] **S. Yang**, M. Balicki, T. S. Wells, R. A. MacLachlan, X. Liu, J. U. Kang, J. T. Handa, R. H. Taylor, C. N. Riviere, "Improvement of optical coherence tomography using active handheld micromanipulator in vitreoretinal surgery," in *Proc. 35th Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. (EMBC)*, 2013, pp. 5674-5677.
- [12] **S. Yang**, R. A. MacLachlan, and C. N. Riviere, "Performance of a six-axis handheld microsurgical robot with ultrasonic linear motors," in *ASME 5th Annu. Dyn. Syst. Control Conf. (DSCC)*, 2012, pp. 395-402.
- [13] **S. Yang**, M. Balicki, R. A. MacLachlan, X. L. Liu, J. U. Kang, R. H. Taylor, and C. N. Riviere, "Optical coherence tomography scanning with a handheld vitreoretinal micromanipulator," in *Proc. 34th Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. (EMBC)*, 2012, pp. 948-951.
- [14] G. M. Grande, A. J. Knisely, B. C. Becker, **S. Yang**, B. E. Hirsch, and C. N. Riviere, "Handheld micromanipulator for robot-assisted stapes footplate surgery," in *Proc. 34th Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. (EMBC)*, 2012, pp. 1422-1425.
- [15] B. C. Becker, **S. Yang**, R. A. MacLachlan, and C. N. Riviere, "Towards vision-based control of a handheld micromanipulator for retinal cannulation in an eyeball phantom," in *Proc. Int. IEEE Conf. Biomed. Robot. Biomech. (BioRob)*, 2012, pp. 44-49.
- [16] **S. Yang**, R. A. MacLachlan, and C. N. Riviere, "Design and analysis of 6 DOF handheld micromanipulator," in *Proc. IEEE Int. Conf. Robot. Autom. (ICRA)*, 2012, pp. 1946-1951.
- [17] G. M. Grande, A. J. Knisely, B. C. Becker, **S. Yang**, B. E. Hirsch, and C. N. Riviere, "Toward robot-assisted stapes fenestration with a handheld micromanipulator," in *Proc. IEEE Annu. Northeast Bioeng. Conf. (NEBEC)*, 2012, pp. 141-142.
- [18] **S. Yang**, K. Park, J. Kim, T. Kim, I. J. Cho, and E. S. Yoon, "Autonomous locomotion of capsule endoscope in gastrointestinal tract," in *Proc. 33rd Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. (EMBC)*, 2011, pp. 6659-6663.
- [19] **S. Yang**, S. Lee, K. Park, J. Kim, J. Cho, H. S. Shin, and E. S. Yoon, "Highly-accurate, implantable micromanipulator for single neuron recordings," in *Proc. IEEE Int. Conf. Robot. Autom. (ICRA)*, 2010, pp. 5070-5075.
- [20] **S. Yang**, J. Kim, S. Lee, J. Cho, H. S. Shin, and E. S. Yoon, "Precision automatic microdrive array for chronic single unit recordings in freely behaving mice," *the Society for Neuroscience's 39th annual meeting (SfN)*, 2009.

- [21] K. Park, **S. Yang**, J. Kim, T. Kim, and E. S. Yoon, "Improvement of locomotive performance of capsular microrobot moving in GI tract using position based feedback control," in *Proc. 31st Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. (EMBC)*, 2009. PP. 6076-6079.
- [22] H. Bae., **S. Yang**, K. Na, E. S. Yoon, and J. Kim, "Randomized cell modeling for calculating the contractile force of cardiomyocyte," *the 24th International Technical Conference on Circuits/Systems, Computers and Communications*, 2009.
- [23] P. D. Cuong, R. A. Singh, K. Na, **S. Yang**, and E. S. Yoon, "Nature-inspired tribological surfaces for nano/micro-scale applications," *International Symposium on Nature Inspired Technology*, 2009.
- [24] P. D. Cuong, R. A. Singh, K. Na, **S. Yang**, and E. S. Yoon, "Topographically-chemically modified silicon surfaces as tribological candidates for miniaturized (MEMS) devices," *KSME-JSME Joint Int'l Conference on Manufacturing, Machine Design and Tribology*, 2009.
- [25] K. Na, R. A. Singh, P. D. Cuong, **S. Yang**, and E. S. Yoon, "Adhesion and friction forces on silicon wafers with dual surface modifications at nano-scale," *Society of Tribologists and Lubrication Engineers 64th Annual Meeting and Exhibition*, 2009.
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