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Education

- Ph.D. 2014** Mechanical Engineering, Johns Hopkins University, Baltimore, Maryland, USA.
Dissertation: 'Image-guided robots for Urology'
Advisor: Dan Stoianovici
- M.S.E. 2010** Mechanical Engineering, Johns Hopkins University, Baltimore, Maryland, USA.
- B.S. 2008** Mechanical Engineering, Physics (minor), Seoul National University, Seoul, South Korea

Positions and Employment

- 2015 - Present Senior Researcher, Center for Medical Robotics, Korea Institute of Science and Technology
Seoul, South Korea
- 2014 - 2015 Postdoctoral Fellow, Pediatric Cardiac Bioengineering Lab (Prof. Pierre Dupont)
Harvard Medical School, Boston, MA
- 2008 - 2014 Graduate Research Assistant, Urology Robotics Lab (Prof. Dan Stoianovici),
Urology / Mechanical Engineering, Johns Hopkins University, Baltimore, Maryland, USA
- 2007 - 2008 Undergraduate Research Assistant, Biorobotics Lab (Prof. Jung Kim),
Korean Advanced Institute of Science and Technology, Daejeon, Korea
- 2004 - 2006 Technical Staff, Park Systems Inc. (Atomic Force Microscope manufacturing company),
Suwon, Korea

Research Interests

My research interest lies in the field of medical robotics, especially in surgical robots and image-guided robot systems for minimally invasive interventions. Topics of particular interest are:

- (1) Dexterous wrist mechanisms for micro-laparoscopic tools
- (2) Robotic catheters for minimal invasive interventions: Design and control of steerable catheters based on mechanical model.
- (3) Intraoperative image-guided robots: Ultrasound and fluorescence image guidance during surgery
- (4) Magnetic Resonance (MR) image-guided robots: Development of mechanisms and sensors that are compatible with the high magnetic field environment of the MR scanner.

Journal Papers

1. Kim J, Lee W, Kang S, Cho K, **Kim C**: A Needlescopic Wrist Mechanism with Articulated Motion and Kinematic Tractability for Micro Laparoscopic Surgery. *IEEE/ASME TRANSACTIONS ON*

- MECHATRONICS*. 2019, (Revision under review)
2. Kim J, Choi W, Kang S, **Kim C**, Cho K: Continuously Variable Stiffness Mechanism using Non-uniform Patterns on Coaxial Tubes for Continuum Micro-surgical Robot, *IEEE Transactions on Robotics*. 2019, (Accepted)
 3. Shin DA, **Kim C**, Yudoyono F, Yun Y, Ha Y, Kang S: Feasibility of Percutaneous Robot-Assisted Epiduroscopic System. *Pain Physician*. 2018;21(5):E565-E571.
 4. Damian DD, Price K, Arabagi S, Berra I, Machaidze Z, Manjila S, Shimada S, Fabozzo A, Arnal G, Van Story D, Goldsmith JD, Agoston AT, **Kim C**, Jennings RW, Ngo PD, Manfredi M, Dupont PE: In vivo tissue regeneration with robotic implants. *Science Robotics*. 2018; Vol.3(14).
<http://robotics.sciencemag.org/content/robotics/3/14/eaag0018.full.pdf>
 5. Ball MW, Ross AE, Ghabili K, **Kim C**, Jun C, Petrisor D, Pan L, Epstein JI, Macura KJ, Stoianovici DS, Allaf ME: Safety and Feasibility of Direct Magnetic Resonance Imaging-guided Transperineal Prostate Biopsy Using a Novel Magnetic Resonance Imaging-safe Robotic Device. *Urology*. Jul 19 2017. PMID:28735018
 6. Stoianovici D, **Kim C**, Petrisor D, Jun C, Lim S, Ball MW, Ross A, Macura KJ, Allaf ME: MR Safe Robot, FDA Clearance, Safety and Feasibility of Prostate Biopsy Clinical Trial. *IEEE/ASME TRANSACTIONS ON MECHATRONICS*. 2017; Vol.22(1) pp.115-126.
 7. Chang D, Chong X, **Kim C**, Jun C, Petrisor D, Han M, Stoianovici D: Geometric systematic prostate biopsy. *Minim Invasive Ther Allied Technol*. Apr 2017; Vol.26(2) pp.78-85. PMID:27760001
 8. Stoianovici D, **Kim C**, Srimathveeravalli G, Sebrecht P, Petrisor D, Coleman J, Solomon SB, Hricak H: MRI-Safe Robot for Endorectal Prostate Biopsy. *IEEE-ASME Transactions on Mechatronics*. Aug 2014; Vol.19(4) pp.1289-1299.
 9. Srimathveeravalli G, **Kim C**, Petrisor D, Ezell P, Coleman J, Hricak H, Solomon SB, Stoianovici D: MRI-safe robot for targeted transrectal prostate biopsy: animal experiments. *BJU Int*. Jun 2014; Vol.113(6) pp.977-985.
 10. Stoianovici D, **Kim C**, Schafer F, Huang CM, Zuo YH, Petrisor D, Han M: Endocavity Ultrasound Probe Manipulators. *IEEE-ASME Transactions on Mechatronics*. Jun 2013; Vol.18(3) pp.914-921.
 11. **Kim C**, Chang D, Petrisor D, Chirikjian G, Han M, Stoianovici D: Ultrasound probe and needle-guide calibration for robotic ultrasound scanning and needle targeting. *IEEE Transactions on Biomedical Engineering*. Jun 2013; Vol.60(6) pp.1728-1734.
 12. Han M, Chang D, **Kim C**, Lee BJ, Zuo Y, Kim HJ, Petrisor D, Trock B, Partin AW, Rodriguez R, Carter HB, Allaf M, Kim J, Stoianovici D: Geometric evaluation of systematic transrectal ultrasound guided prostate biopsy. *J Urol*. Dec 2012; Vol.188(6) pp.2404-2409.
 13. Badaan S, Petrisor D, **Kim C**, Mozer P, Mazilu D, Gruionu L, Patriciu A, Cleary K, Stoianovici D: Does needle rotation improve lesion targeting? *Int J Med Robot*. Jun 2011; Vol.7(2) pp.138-147.
 14. Han M, **Kim C**, Mozer P, Schafer F, Badaan S, Vigar B, Tseng K, Petrisor D, Trock B, Stoianovici D: Tandem-robot Assisted Laparoscopic Radical Prostatectomy to Improve the Neurovascular Bundle Visualization: A Feasibility Study. *Urology*. Feb 2011; Vol.77(2) pp.502-506.

Selected Conference Papers

1. Kwon S, Walker S, Choi S, Park K, Kim K, Kang S, **Kim C**, Ryu S: Design and Fabrication of Transformable Head Structures for Endoscopic Catheters, *2019 IEEE International Conference on Robotics and Automation (ICRA)* (Accepted)
2. **Kim C**, J Kim, Kang S: Development of 5 mm Articulating Wristed Instrument for Micro-laparoscopy, *Hamlyn Symposium on Medical Robotics 2018. (Finalists for Surgical Robot Challenge)*
3. An B, Lee W, Kang S, **Kim C**: Design Parameter optimization of a Novel Serial Manipulator for Microsurgery. *2017 14th International Conference on Ubiquitous Robots and Ambient Intelligence (Urai)*. 2017; pp.146-151. **BEST PAPER AWARD**. PMID:WOS:000426976900031
4. **Kim C**, Ryu SC, Dupont P.E: Real-time adaptive kinematic model estimation of concentric tube robots. *2015 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 3214-3219

5. Stoianovici D, **Kim C**, Jun C, Petrisor D, Macura K, Ross A, Allaf M: Direct MRI-Guided Transperineal Prostate Biopsy with MR-Safe Robot. First FDA-Approved Robot for the MR Environment. *Engineering and Urology Society, 29th Annual Meeting*. 2014; pp. 26, **BEST PAPER AWARD**.
6. **Kim C**, Srimathveeravalli G, Sebrecht P, Petrisor D, Ezell P, Coleman J, Solomon S, Hricak H, Stoianovici D: Robot-Assisted Direct MRI-Targeted Transrectal Prostate Biopsy. *Engineering and Urology Society, 27th Annual Meeting*. 2012; pp. 50. **Outstanding Paper Award**.
5. **Kim C**, Schafer F, Chang DY, Petrisor D, Han M, Stoianovici D: Robot for Ultrasound-Guided Prostate Biopsy. *Engineering and Urology Society, 27th Annual Meeting*. 2012; pp. 50. **Outstanding Paper Award**.
6. Stoianovici D, Petrisor D, **Kim C**, Coleman J, Solomon S, Hricak H: MRI Guided Prostate Biopsy Robot Development. *Engineering and Urology Society, 25th Annual Meeting*. 2010; pp. 39, **Outstanding Paper Award**.
7. Huang CM, **Kim C**, Petrisor D, Lee D, Han M, Stoianovici D: Partial Volume Artifact on Prostate Ultrasound Imaging. *Engineering and Urology Society, 25th Annual Meeting*. 2010; pp. 32, **Outstanding Paper Award**.
8. Han M, **Kim C**, Mozer P, Badaan S, Vigaru B, Schaefer F, Petrisor D, Trock B, Stoianovici D: Tandem Robot Assisted Laparoscopic Radical Prostatectomy: Clinical Feasibility Study for Neurovascular Bundle Visualization. *Engineering and Urology Society, 24th Annual Meeting*. 2009; pp. 25, **BEST PAPER AWARD**.

Patents

1. Stoianovici D, Petrisor D, Schäfer F, **Kim C**, Han M: Remote Center of Motion Robot for Medical Image Scanning and Image-Guided Targeting. *USA Patent Application PCT/US2011/060362*
2. Stoianovici D, Han M, Petrisor D, **Kim C**: Cohesive Robot-Ultrasound Probe for Prostate Biopsy. *USA Patent Application PCT/US2013/035928*
3. Stoianovici D, Petrisor D, **Kim C**, Sebrecht P: MRI-Safe Robot for Transrectal Prostate Biopsy. *USA Patent Application PCT/US2013/063808*