

Younsuk Kim

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Education

- 2014–current **Johns Hopkins University, Baltimore, MD, USA, PhD Program, Computer Science.**
Research interests : Ultrasound thermal imaging, medical devices development and tracking
Research Assistant - Ultrasound thermal imaging, single-element imaging, surgical tool tracking, etc
- 2008–2009 **Johns Hopkins University, Baltimore, MD, USA, Masters Degree, Electrical and Computer Engineering.**
Research projects : Time-reversal ultrasound imaging system, biomorphic CMOS imagers and Bioamplifiers
- 2004–2008 **Tsinghua University, Beijing, China, Bachelor's Degree, Microelectronics and Nanoelectronics Engineering.**
Thesis : High-resolution Digitally Controlled Oscillator for Next Generation Wireline Applications

Work Experience

- Dec 2013 – **Korea Electronics Technology Institute, IoT Convergence Research Center, Gyeonggi, Korea,**
Feb 2014 Research Engineer.
- Published a domestic conference paper on the topic of High-speed Computational Fluid Dynamics Simulation of Coronary Artery using GPUs, implemented using CUDA.
- Nov 2009 – **LG Electronics, Inc, R&D Division/Advanced Technology Team, Seoul, Korea, Research**
Mar 2013 Engineer.
- Developed 6 and 9-axis Motion Sensor Remote Control as a hardware and firmware engineer, played a pivotal role including chip selection, main board design and firmware development.
- Researched multi-view 3D Auto-stereoscopy TV, developed head tracking system for 3D TV without glasses as a software engineer.
- Researched Holographic TV, conducted training and seminars for division's executives on the topic of principles of Holographic TV technology.
- Developed TV mainboard for Chinese market as a hardware engineer, and also involved in mass production technical trouble shooting.
- Served military duty as a government designated Technical Research Specialist due to strong academic records and previous research achievements.
- Jul 2007 – **Samsung Electronics, Inc, Telecommunication Research and Development Center, Beijing,**
Aug 2007 China, Research Intern.
Developed new applications for mobile phone in the Research and Strategy Group.

Skills & Abilities

- Programming Languages Matlab, Python, C, C++, Java, SQL, etc.
- Tools Deep learning (Pytorch, Keras, Tensorflow), Zuken, FPGA, MCU control, Spice tools, etc.

Languages

- Korean Native Speaker
English Full professional proficiency
Chinese Full professional proficiency

Projects & Publications

2014 – **Ultrasound thermometry.**

- current
- **Y. Kim**, C. Audigier, N. Ellens, and E. Bector. Low-cost ultrasound thermometry for HIFU therapy using CNN. In 2018 IEEE International Ultrasonics Symposium (IUS), 2018.(Accepted)
 - **Y. Kim**, C. Audigier, Emran M. A. Anas, J. Ziegler, M. Friebe, and E. Bector. CUST: CNN for Ultrasound thermal image reconstruction using Sparse Time-of-flight information, Point-of-care ultrasound (POCUS) MICCAI workshop 2018. (Accepted)
 - C. Audigier, **Y. Kim**, N. Ellens, and E. Bector. Physics-based Simulation to enable Ultrasound monitoring of HIFU ablation: an MRI validation, Medical Image Computing and Computer-Assisted Intervention MICCAI 2018. (Accepted)
 - **Y. Kim**, C. Audigier, J. Ziegler, M. Friebe, and E. Bector. Ultrasound thermal monitoring with an external ultrasound source for customized bipolar RF ablation shapes. International Journal of Computer Assisted Radiology and Surgery, Apr 2018.
 - J. Ziegler, C. Audigier, J. Krug, G. Ali, **Y. Kim**, E. Bector, and M. Friebe. Rf-ablation pattern shaping employing switching channels of dual bipolar needle electrodes: ex vivo results. International Journal of Computer Assisted Radiology and Surgery, Apr 2018.
 - **Y. Kim**, C. Audigier, N. Ellens, and E. Bector. A novel 3d ultrasound thermometry method for hifu ablation using an ultrasound element. In 2017 IEEE International Ultrasonics Symposium (IUS), pages 1-4, 2017.
 - C. Audigier, **Y. Kim**, and E. Bector. A novel ultrasound imaging method for 2d temperature monitoring of thermal ablation. In Imaging for Patient-Customized Simulations and Systems for Point-of-Care Ultrasound, pages 154-162, 2017.
 - C. Audigier, **Y. Kim**, A. Dillow, and E. Bector. Computational modeling of radiofrequency ablation: evaluation on ex vivo data using ultrasound monitoring. In Proc.SPIE, pages 10135 - 10, 2017.
 - **Y. Kim**, X. Guo, A. Cheng, and E. Bector. Speed of sound estimation with active pzt element for thermal monitoring during ablation therapy: feasibility study. In Proc.SPIE, pages 9790 - 8, 2016.
- Three more conference papers are accepted and pending for publication due to a patent application . (Two first author papers and one second author paper)

2014 – **Single element ultrasound imaging.**

- current
- H. Zhang, **Y. Kim**, A. Moghekar, N. Durr, and E Bector. Single-Element Needle-Based Ultrasound Imaging of the Spine: An *In Vivo* Feasibility Study. Point-of-care ultrasound (POCUS) MICCAI workshop 2018. (Accepted)
 - H. Zhang, **Y. Kim**, M. Lin, M. Paredes, K. Kannan, A. Moghekar, N. Durr, and E Bector. Toward dynamic lumbar puncture guidance using needle-based single-element ultrasound imaging. Journal of Medical Imaging, pages 5 - 10, 2018.
 - H. Zhang, M. Lin, **Y. Kim**, M. Paredes, K. Kannan, N. Patel, A. Moghekar, N. Durr, and E. Bector. Toward dynamic lumbar punctures guidance based on single element synthetic tracked aperture ultrasound imaging. In Proc.SPIE, pages 10135 - 11, 2017.
 - H. Zhang, H. Huang, C. Lei, **Y. Kim**, and E. Bector. Software-based approach toward vendor independent real-time photoacoustic imaging using ultrasound beamformed data. In Proc.SPIE, pages 10064 - 6, 2017.

2014 – 2018 **Photoacoustic catheter tracking.**

- A. Cheng, **Y. Kim**, Y. Itsarachaiyot, H. Zhang, R. Clifford, R. Taylor, and E. Bector. Photoacoustic-based catheter tracking: simulation, phantom, and in vivo studies. Journal of Medical Imaging, 5 - 10, 2018.
- A. Cheng, Y. Itsarachaiyot, **Y. Kim**, H. Zhang, R. Taylor, and E. Bector. Catheter tracking in an interventional photoacoustic surgical system. In Proc.SPIE, pages 10135 - 8, 2017.
- A. Cheng, **Y. Kim**, HK. Zhang, R. Taylor, and E. Bector. Catheter tracking in an interventional photoacoustic surgical system. In 2016 Conference on Lasers and Electro-Optics (CLEO), pages 1-2, 2016.

- 2014 – 2017 **Ultrasound tomography, Evaluation platform for ultrasound-guided navigation system, Robot-based ultrasound calibration, Medical device tracking.**
- A. Cheng, **Y. Kim**, E. Anas, A. Rahmim, E. Bector, R. Seifabadi, B. Wood. Use of Deep Learning to Reconstruct Limited-Angle Ultrasound Tomography Images in Prostate Cancer: A Simulation Feasibility Study. In 2018 IEEE International Ultrasonics Symposium (IUS), 2018 (Accepted).
 - **Y. Kim**, S. Kim, and E. Bector. Consistent evaluation of an ultrasound-guided surgical navigation system by utilizing an active validation platform. In Proc.SPIE, pages 10135 - 6, 2017.
 - F. Aalamifar, A. Cheng, **Y. Kim**, X. Hu, H. Zhang, X. Guo, and E. Bector. Robot- assisted automatic ultrasound calibration. International Journal of Computer Assisted Radiology and Surgery, 11(10):1821-1829, Oct 2016.
 - Q. Ma, J. Davis, A. Cheng, **Y. Kim**, G. Chirikjian, and E. Bector. A new robotic ultrasound system for tracking a catheter with an active piezoelectric element. In 2016 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), pages 2321- 2328, 2016.
 - **Y. Kim**, Guo X., and Bector E. New platform for evaluating ultrasound-guided interventional technologies. In Proc.SPIE, pages 9790 - 9, 2016.

Patents

- THREE-DIMENSIONAL REAL TIME ULTRASOUND MONITORING SYSTEM FOR ABLATION THERAPY (Pending), 2018
- SYSTEM FOR GENERATING SYNTHETIC APERTURE ULTRASOUND IMAGES DURING NEEDLE PLACEMENT, PCT/US2017/030660, WO2017192603, 2017
- MULTIMEDIA DEVICE FOR COMMUNICATING WITH AT LEAST ONE DEVICE AND METHOD FOR CONTROLLING THE SAME, 1020140029810, Korea, 2014

Awards

- IEEE International Ultrasonics Symposium Student Travel Support, Competitive basis, 2018 (Low-cost ultrasound thermometry for HIFU therapy using CNN.)
- SPIE Medical Imaging Young Scientist Awards, Runner-up, 2017 (Toward dynamic lumbar punctures guidance based on single element synthetic tracked aperture ultrasound imaging)
- Dean's Merit Scholarship for MSc students , 2008 - 2009

Teaching

- Head Teaching Assitant - Database systems, 2017.
- Head Teaching Assitant - Computer system fundamentals, 2014.
- Course Assistant - Computer-Integrated Surgery, 2016.

Extracurricular Activities

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| Student associations | Served as a board memeber at Johns Hopkins Univseristy and Tsinghua university |
| Ski | Certified Official Ski Instructor level 2 at Korean Ski Instructors Association |