

I am a Medical Robotics Engineer with an expertise in robotic system design, robot controls and analysis. I have a broad background in Mechanical Engineering, Robotics, Robot controls, and Computer Integrated Surgery.

Technical Skills

- In-depth understanding of robotics fundamentals, such as robot kinematics, path planning, robotic system integration, controls, software development
- Robot Software skills – KUKA iiwa med (Certificate 2023), Commercial Motor/motion control applications, C++, java, python
- A strong background in classical mechanical engineering, design optimization, hardware design, control theory, electro-mechanical design, system modeling and simulation
- Various experiences in robotic system design utilizing risk analysis, and system evaluation in a regulated environment (FDA, CE)
- Published +10 peer-reviewed Journal papers in the image-guided robotic system design and its applications in Urology, and Neurosurgery

EXPERIENCE

2020 Jan – Present	Director of Robotics R&D , US Medical Innovations LLC, Takoma, MD -Design and develop a robotic platform for a robot-assisted cold plasma delivery system for soft tissue treatment project. Hold responsibilities of the project coordination with system architecture, software development, mechanical/electrical hardware engineering, biological studies. -Implemented a new motion controller using Faulhaber motion solutions (C++/C#) and a new voice activation engine (MS) for a Robotic endoscopy manipulator (FDA K082233, K122820). -Lead an FDA 510K submission for a hand-held robotic laparoscopic instrument manipulator (2022 Nov, 510K cleared, K212736)
2018 Dec – 2019 Dec	Senior Robotics Engineer, R&D , US Medical Innovations LLC, Takoma, MD -Implemented a DC motor PID controller using cortex M4 in C, a system integration with user interface for a hand-held robotic laparoscopic instrument manipulator
2017 Nov – 2018 Nov	Post-doctoral Researcher, (PI: Jean-Paul Wolinsky, MD) , Neurosurgery, Northwestern University, Chicago, IL -Designed and prototyped a new type of medical image-guided robotic system and methods for brain/spinal cord cancer treatment -Participated in a clinical trial to evaluate a vision-based navigation system (7D surgical) for spine surgery -Developed a patient- specific designed, biomechanically optimized implants for sacrum reconstruction after En bloc sactrectomy based on 3D printing technology, computer integrated surgery algorithms
2011 Nov-2017 Nov	Research Assistant, (Advisor: Dan Stoianovici, PhD) , Urology Robotics Laboratory, Johns Hopkins University, Baltimore, MD -Programmed control software for robotic biopsy device based on EPOS(CAN) microprocessor in C++ -Implemented robot controller design to integrate sensors and actuators for the ultrasound probe guided robot and robotic liquid biopsy device. -Designed and prototyped multiple robot hardware mechanism for medical image-guided robots (MRI/CT/US) -Implemented algorithms for robotic steerable needle insertion under ultrasound image guidance -Tested and Calibrated the accuracy and precision of the robots using optical tracking -Programmed CNC for robot hardware manufacturing with Haas 5-axes machining center -Implemented dynamics modelling, system identification, design optimization for developing new type of pneumatic driven needle biopsy device for prostate cancer diagnosis -Performed cadaver studies and clinical trials with medical image-guided robotic systems
2011 Jan-July	Mechanical Engineer , Samsung Engineering LTD. Seoul, South Korea Supervised mechatronics design of automated facilities for aluminum cast house plants in Saudi Arabia
2003 Dec-2006 Dec	Manufacturing Engineer , SK Altec LTD. Incheon, South Korea Programmed and Managed +20 CNC machines

EDUCATION

2017 Dec	PhD , Urology Robotics Program, Mechanical Engineering, Johns Hopkins University, Baltimore, MD Thesis : “ Image-Guided Robot-Assisted Needle Intervention Devices and Methods to Improve Targeting Accuracy “ Committee members : Russel H Taylor, Gregory S Chirikjian, Jean-Paul Wolinsky, Dan Stoianovici
2013 May	Master of Science , in Mechanical Engineering, (Robotics) Johns Hopkins University, Baltimore, MD GPA: 3.9/4.0
2010 Dec	Bachelor of Science , in Mechanical Engineering, Illinois Institute of Technology, Chicago, IL GPA: 3.7/4.0

PATENTS

2016 Jan	US20210128122A1D. Stoianovici, C. Jun, D. Petrisor, M. Han: Straight Insertion, Pneumatic Soft Tissue Biopsy Needle.
2016 March	US20190142396A1 D. Stoianovici, D. Petrisor, C. Jun, S. Lim: MR-Safe Remote Center of Motion Robot
2017 Dec	WO2019160595A1 D. Stoianovici, D. Petrisor, C. Jun, K. Pienta: Liquid Biopsy Method And Device
2020 Sep	US20230270484A1 J. Canady C. Jun, T. Zhuang : System and method for enhanced-reality electrosurgical system
2020 Sep	US20220076824A1/ US20230122461A1 J. Canady C. Jun, T. Zhuang : System and method for voice-control of electrosurgical system
2021 Mar	WO2022187639A1/ WO2022006073A1 J. Canady C. Jun, T. Zhuang : Robotic cold atmospheric plasma surgical system and method
2022 Feb	WO2023150312A1 J. Canady C. Jun, T. Zhuang, B. Sumanasena, Y. Wu, F. Yan, P. Rubio :Electrosurgical system with adaptive non-thermal plasma control