

## EXPERIENCE

**Senior Robotics Controls Engineer**, NuVasive (Surgical Intelligence) – San Diego, CA *Feb 2022 – Present*

*Robotics and Controls (Java, MATLAB, Python)*

- ⚙ Implement MATLAB interface to fully control robot arm and optical tracking system for rapid-prototyping
- ⚙ Develop control algorithms for robotic solutions based on clinical requirements and feedback
- ⚙ Create robust controls architecture to seamlessly integrate with the Pulse Navigation Platform
- ⚙ Write and maintain documentation/processes to comply with IEC 62304 and support 510K submission

*Systems Engineering*

- ⚙ Establish test methods to measure performance of robot system for technical risk burn down
- ⚙ Contributed to the design of test fixtures and system components from a robotics perspective
- ⚙ Write and review system and sub-system level requirements
- ⚙ Participate in Spine cadaveric labs and collect VOC from surgeons and surgical staff

**Staff/Senior Robotics Controls Engineer**, Stryker (Robotics) – Weston, FL *Apr 2019 – Jan 2022*

*Robotics and Controls (C, MATLAB, Python)*

- ⚙ Developed and implemented algorithms and safety mitigations for dynamic robot tracking
- ⚙ Created method to measure and compensate latency between tracking and robotic systems
- ⚙ Developed a robust algorithm to detect unintended motion in the tracking system for patient safety
- ⚙ Implemented system performance analysis scripts to measure stability, optical tracking, and output accuracy
- ⚙ Created bone preparation workflows for unique procedures and cutting tools
- ⚙ Developed real-time modules for haptic constraints in cartesian and joint-space including PID tuning
- ⚙ Performed software/controls duties from concept to release of the TKA 2.0 robotic application

*System Integration*

- ⚙ Developed scripts for automated logging and analysis of output variables from a real-time robotic system
- ⚙ Designed and executed engineering studies and DOEs to assess system and component performance
- ⚙ Implemented methods for robot characterization and calibration at sub-component and system levels
- ⚙ Participated in Knee and Shoulder cadaveric labs and collect VOC from surgeons and surgical staff

**Robotics Embedded Engineer**, Stryker (Robotics) – Davie, FL *Aug 2017 – Mar 2019*

*Software/Embedded Engineering (C, MATLAB, Python)*

- ⚙ Developed configurable surgical robot simulator for several surgical indications, instruments, and systems
- ⚙ Architected application to aide in qualifying final production of robotic system and in-field maintenance
- ⚙ Designed a firmware solution used for battery management of a network connected device
- ⚙ Implemented in-field firmware upgrade protocol and firmware security features
- ⚙ Created software interfaces for a variety of motor controllers with EtherCAT and Serial protocols
- ⚙ Designed hardware and software for a handheld 3D mapping tool used to register anatomy to tracking system

## PUBLICATIONS & PATENTS

**Robotic Surgical System With Recovery Alignment**, U.S. Patent Application (17/513,368) *filed Oct 28 2021*

**Robotic Surgical System Including A Coupler For Connecting A Tool To A Manipulator  
And Methods Of Using The Coupler**, U.S. Patent Application (17/393,728) *filed Aug 04 2021*

**Teaching Agents with Deep Apprenticeship Learning**, RIT MS Thesis *Jun 2017*

**Milpet – The Self-Driving Wheelchair**, Electronic Imaging - Autonomous Vehicles and Machines 2017 *Jan 2017*

**Giving Independence Back to the Elderly and Physically Disabled**, IEEE WNYISPW 2015 *Dec 2015*

## EDUCATION

**Rochester Institute of Technology (RIT)**, Rochester, NY *Sep 2012 – Aug 2017*

Master of Science in Computer Engineering – (3.905/4.000)

Bachelor of Science in Computer Engineering, Minor in Economics – Summa Cum Laude (3.893/4.000)