# Wen-Yu (Marty) Cheng

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## Summary

**Versatile** researcher with over **7 years** of experience in **smart wearables design**, **AI integration**, **robotics**, **rapid prototyping**, **cross-domain problem solving**, **academic/grant writing**, and **leadership**. Loves solving critical challenges. Possess deep expertise across multiple engineering fields for interdisciplinary projects. Highly interested in **AI** applications in medical and Human-Computer/Human-Robot Interaction **(HCI/HRI)** fields.

## Experience

**Research Assistant** **08/2018 – Present**
**Florida Atlantic University, BioRobotics Lab, Dr. Erik Engeberg** **Boca Raton, FL**

- Designed a novel high-density **Force Myogram (FMG)** sensor array, outperforming EMG with 99% classification accuracy across 20 hand gestures using AI pattern recognition in a test involving **over 10 human subjects**. Publication currently in progress.
- Developed and integrated custom software, firmware, and hardware components for data collection, featuring a novel **biodata** processing and analysis method with an intuitive subject testing **user interface**.
- Led the development of a Variable-Pressure **Prosthetic Socket** using Granular Jamming technology and secured **$1,200** in 2021 to further advance the project.
- Led a project team in securing **$2,400** in consecutive grants (2018 and 2019) to develop a novel modular **Soft Robotic Haptic Feedback** system.

**Florida Atlantic University, Dr. Zhen Ni**

- Developed a low-cost Wireless Charging Station for use with the integrated **computer vision** system of the TurtleBot 3 mobile robot platform. Results published and presented at **2023 IEEE HONET** conference.
- Improved an AI **PPO** training algorithm for Kinova Gen 3 manipulator **parallel training**. Publication in progress.

**Research Intern** **06/2020 – 02/2024**
**Johns Hopkins University, Dr. Nitish Thakor** **Baltimore, MD**

- Designed a novel biomimetic Soft-Rigid Hybrid Prosthetic Finger with more than 3 times the grasping force of traditional soft robotic prosthetic fingers. Published findings in **IEEE Science Advances** Journal.
- Performed extensive finite element analysis **(FEA)** to ensure proper material selection and prevent failure.
- Integrated an innovative tactile sensor into the hybrid prosthetic finger for biomimetic **touch sensing**. Published findings at the 2022 **IEEE Sensors** Conference.

**Systems Engineer** **11/2023 – 03/2024**
**Golden Hour Medical** **Boca Raton, FL**

- Led the effort in bringing new **IoT-enabled** life-saving **automatic tourniquet** device into mass production and ensured functionality of critical complex systems, all within **four months** of the fast-moving demands of a new **startup**.
- Operated with strict adherence to FDA **ISO 13485** and **14971** regulations for biomedical devices, including extensive engineering documentation/history and collaborating with the Quality Assurance team for device risk management.

## Skills

- **Design/Prototyping** – Solidworks, Fusion 360, Blender, Unity, Unreal Engine, 3D printer proficiency, ANSYS Workbench, embedded systems development, design for manufacturability (DFM), LabVIEW, git version control
- **Coding Languages** – MATLAB & Simulink, C, C++, Python, Swift, Arduino, R, HTML
- **AI Experience** – LLM, RAG, Langchain, OpenAI API, Deep Reinforcement Learning, Scikit-learn, TensorFlow, PyTorch
- **Robotics Proficiency** – Universal Robotics (UR) Lineup, Kinova Gen3 Lite, TurtleBot, ROS, Gazebo

## Education

**Florida Atlantic University**

- BS in **Mechanical Engineering** with a Minor in **Computer Science** – Innovation Leadership Honors Program (ILHP)
- MS in **Artificial Intelligence** – Big Data Analytics **Certificate**
- Pursuing a PhD in **Computer Science**