**Noelle Morgan**
ncmorgan@pm.me
**linkedin.com/in/noelle-morgan-64aa33174/ | gitlab.com/ppg0291**

---

## Education

**Worcester Polytechnic Institute (WPI)** **August 2022**

**Bachelor of Engineering: Electrical and Computer Engineering** **GPA: 3.2**

**Relevant courses:** Introduction to Robotics, Unified Robotics I-II, Introduction to Digital Circuit Design, Sensors, Circuits, and Systems, Embedded Computing in Engineering Design, Real-Time Embedded Systems, Introduction to Program Design, Electrical and Computer Engineering Design, Embedded Core Architecture Design, 3D Modeling I

## Experience

**DCS Corporation** **October 2022 - present**

- ❖ Automated and designed the Graphic User Interface for sonic welders on premises
  - ➢Developed functionality in Python and translated commands into a unique scripting language
  - ➢Implemented measurement and memory functions into the interface for consistent welds
  - ➢Supported project funded by Advanced Functional Fabrics of America (AFFOA)
- ❖Developed Finite Element Analysis (FEA) model of proprietary e-textile solutions
  - ➢Utilized MATLAB to find the ideal characteristic impedance of e-textile cables, designed a software model to predict cable performance
  - ➢Second iteration harnesses Unreal Engine, CST Studio Suite, and Blender to procedurally generate and unwrap geometry for use in electrical simulations
- ❖Digitized and Fabricated Embroidered Fabric Circuit Boards
  - ➢ Translated Printed Circuit Board (PCB) designs into an embroiderable file format
  - ➢Fabricated functioning circuit board made entirely of fabric that maintains its fabric-like qualities with 6& improvement in data transmission quality
- ❖Improved carbon nano-tube heating element design (U.S. Army Natick Soldier Systems Center)
  - ➢ Used sewing to improve on heating elements to be thinner, significantly more flexible, and simpler to manufacture
  - ➢ Lead to further improvements that gave heaters ability to withstand 700+x cycles with minimum degradation
  - ➢3D modeled and designed e-textile buckle connectors to integrate electronic systems tightly with existing clothing conventions

**Amazon Robotics Firmware Engineering Co-op** **January 2021 - June 2021**

- ❖ Designed and wrote over 80 Python and C based firmware tests to ensure safety and quality standards for robots used on the floors of Amazon warehouses
  - ➢ Utilized Linux based testing framework to operate these tests remotely over SSH connection
  - ➢ Designed over 80 tests to regulate sensors and correct procedure of operation
  - ➢ Built software framework that standardized future iterations of Amazon Robots
- ❖ Eliminated 3 repositories of redundant code, enhancing efficiency of robot testing and operations using C based firmware improvements and Bash scripting
  - ➢ Copies of these scripts were shared across the team, preventing repetitive work
- ❖ Managed over 90 branches of firmware using Git-based version control and agile project management methods to create, analyze, and regulate tasks

**U.S. Food and Drug Administration(FDA)** **June 2018 - August 2019**

- ❖ Spearheaded a research study on MRI test materials, seeking to find inexpensive, easily accessible, and shelf-stable materials compared to those used in common practice today
  - ➢ Utilized MATLab to analyze scans and calculate T1 and T2 values across a region of interest
  - ➢ Impact of results can be used to develop shelf stable and significantly less expensive MRI test materials than industry standard
  - ➢ Presented findings at FDA's Summer Research Poster Symposium to local officials and FDA Scientists and regulators.
- ❖ Developed documentation on novel bypass prosthetic devices through careful analysis of datasheets and decisive testing situations that will be used in research on the accuracy of various motion capture systems for amputee rehabilitation applications.
- ❖ Developed various devices to assist various FDA labs with their experiments that include virtual reality prosthetic simulation and Stereolithography (SLA) particles in biomedical devices.
  - ➢ Used various development suites (Fritzing, EagleCAD) for various microcontrollers (ATMega328p, STM32) to write custom firmware for devices such as custom wireless haptic feedback controllers and infrared microscope attachments

**Projects**

- ❖ **Electronic Quilting Design Wall (completed)**
  - ➢ Developed and fabricated textile-based interface for quilting design software. Leveraged e-textile technology to assist quilters digitize their creative process in a familiar way. Won best paper in Process Improvement in 5th Annual Andrew P. Sage Memorial Capstone Design Competition
- ❖ **ForeverDM AI RPG Assistant (completed)**
  - ➢ founded an AI powered tabletop RPG assistance Discord chatbot. Utilized Langchain and RAG to recall story details to interpret dice rolls, generate background NPCs, and improv assistance

**Accomplishments**

- ❖ **Grants**

  Secured over $3,500 to develop BearHug project mentioned above through the following grants:
  - ➢ WPI Tinkerbox Fund
  - ➢ WPI Goat Tank Challenge
  - ➢ National Science Foundation I-Corps Program

**Leadership**

- ❖ **Zeta Phi Beta Sorority Incorporated**

  Chartered Psi Phi chapter of Zeta Phi Beta Sorority Inc. at WPI
  - ➢ Featured in President Leshin's speech in WPI's 2022 Commencement Ceremony
  - ➢ Established Zeta Phi Beta Sorority Incorporated as the University's first historically black Greek-lettered organization
- ❖ **National Society of Black Engineers**
  - ➢ 2021- 2022 Senator, interim Vice President. Revolutionized role of Senator by introducing Senate Minutes to further engage the chapter.
  - ➢ 2020-2021 Interim Parliamentarian. Enforced and highlighted the importance of Robert's Rules of Order.
  - ➢ 2019-2020 Finance Chair. Fundraised with African Community Education. Have met with various businesses to solicit sponsorships.

**Skills**

**Programming languages:** MATLab, Java, C++, C, Python, Rust, Javascript
**Software:** Git, KiCad, EagleCAD, Onshape, Fusion360, Solidworks, Adobe CC, ZBrush, Unreal Engine
**Rapid Manufacturing**: Advanced skills in 3D printer, laser cutters, and industrial embroidery machines