Jeffrey Costello Mechanical Engineer, MS | Detailed, Tactful, Perseverant

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Professional Experience, 7 Years

MIT Global Engineering and Research (GEAR) Center ↗

Research Assistant Sept 2022 - September 2024

Role: Electrodialysis parametric modeling and system design. Conduct novel research on the the design and implementation of low-cost, water-efficient, renewable-powered, time-variant electrodialysis reversal desalination systems.

- Reduced year-long simulations from 3 hours to 100 ms for exploring the broader design space of time-variant electrodialysis desalination.
- Proposed new optimization strategies for parametric system design of desalination systems.

Staff Engineer Oct 2021 - Sept 2022 and Jan 2018 - Sept 2019

Role: Support all aspects of research for Masters and PhD level students including the design and implementation of field pilots, computer programming, fabrication, collaboration with international partners, and purchasing.

- Designed and fabricated a fully-automated, PLC-based test apparatus for collecting data from a novel reverse-osmosis desalination system.
- Deploy critical hydraulic and electrical subsystems in four desalination field pilots, including international deployments.

BU Engineering Product Innovation Center ↗

Lab Supervisor / Manufacturing Instructor Sept 2019 - Oct 2021

Role: Oversee daily operations of a state-of-the-art, 15,000 ft^2 machine shop whose throughput was >1000 students per semester. Develop and manage laboratory exercises in the "Automated Design and Manufacturing Laboratory."

- Scratch-built new manufacturing execution software (MES) for the coordination of multiple industrial automation systems and data collection. The full-stack, Linux-based software is still used as a teaching aid for students.
- Instructed 28 students per semester on principles of automated manufacturing including CNC, collaborative robotics, computer vision, PLCs, and statistical process control (SPC).
- Hired and managed two engineering students for MES development.

Chant Engineering Company, Inc ↗

Mechanical Engineer / Project Manager Jun 2017 - Dec 2017

Role: Work multiple concurrent engineering projects and fulfill all project management, engineering math, mechanical design, drafting, and ISO 9001 documentation. Responsibility began at project conception and lasted through fabrication and final delivery to the customer.

- Design and development of two 15,000 psi hydrostatic test chambers.

Education

Master of Science Mechanical Engineering 2022 - September 2024

Massachusetts Institute of Technology (MIT) Cambridge MA

Bachelor of Science Mechanical Engineering 2013 - May 2017

Boston University Boston, MA

Objective

I am a mechanical engineer seeking to apply my arsenal of interdisciplinary skills to challenging system-level problems with impact focused teams. I thrive on the integration of hardware, software, and electronics. I have taught and led teams of engineers in order to deliver complex electromechanical systems.

Skills

Programming, Automation

Python, MATLAB, Linux, Ladder (PLC), HTML/CSS/Javascript, RSLogix, Universal Robots, Teledyne-Dalsa Vision Systems

System Integration, Electronics

CAN, MQTT, RS232/RS485 Serial, Modbus, Relay Logic, Power Electronics

CAD/CAE/CAM

Solidworks, Onshape, PTC Creo, Solidworks FEA, GibbsCAM, HSM Express

Manufacturing

Wire EDM, Manual/CNC Mill and Lathe, FDM and SLA 3D Printers, Laser Cutter, Waterjet

Project Management, Quality Assurance

ISO 9001, Functional Requirements, Technical Documentation, Teaching

Notable Coursework

MIT 6.2222 Power Electronics Laboratory (Fall 2023)

Custom "Camera-Slide" final project incorporated scratch-designed circuitry with a switched capacitor power supply, boost converter, custom stepper motor driver, and Infineon Programmable System-on-Chip.

MIT 2.720 Elements of Machine Design (Spring 2023)

Mathematical modeling "guru." Used homogeneous transformation matrices and principles of precision machine design to inform all design decisions for a precise, accurate desktop lathe. Team competition winners.