Jeffrey Costello MS Mechanical Engineering | Highly Interdisciplinary, Perseverant

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Education

MS Mechanical Engineering 2022 - September 2024
Massachusetts Institute of Technology (MIT) Cambridge MA

BS Mechanical Engineering 2013 - May 2017
Boston University Boston, MA

Professional Experience, 7 Years

MIT Global Engineering and Research (GEAR) Center

Research Assistant Sept 2022 - September 2024
Role: Develop new parametric modeling strategies for the design of low-cost, water-efficient, solar-powered, time-variant electrodialysis reversal desalination (TEDR) systems. Optimize with Genetic Algorithm. Validate against data from field pilots.

- Reduced simulations from 3 hours to 100 ms.
- Demonstrated cost-parity between TEDR and on-grid reverse osmosis.

Staff Engineer Oct 2021 - Sept 2022 and Jan 2018 - Sept 2019
Role: Develop research hardware and software including field pilots, test stands, and experimental test apparatuses. Collaborate with international partners. Conduct in-field testing.

- Developed fully-automated, PLC-based test apparatus for a novel reverse-osmosis desalination system reducing energy consumption demonstrating 15% reduction in energy consumption.
- Deployed 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 with throughput greater than 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).

Chant Engineering Company, Inc

Mechanical Engineer / Project Manager Jun 2017 - Dec 2017
Role: Project management, engineering math, mechanical design, drafting, and ISO 9001 documentation for multiple concurrent engineering projects. Project conception through fabrication and final delivery to the customer.

- Design and development of two 15,000 psi hydrostatic test chambers. Each 22'W X 18'D X 10.5'H chamber was constructed from 1 inch steel plate with a max allowable gap of ¼ inch on all sides.

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 (MS 2024)

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.