

SAMUEL CARTON

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Experience

Watts Water Technologies

North Andover, MA

Research and Technology Engineer (Co-Op)

February 2022 – July 2026

- Developed a high-fidelity MATLAB simulation using contact mechanics, percolation theory, and fluid dynamics to mathematically quantify the effect of microscale surface defects on valve seal integrity, applicable across the company's full product portfolio
- Designed and built an automated seal integrity test system covering mechanical design, custom electronics, and Python-based control software, eliminating 160 labor hours per week and documenting findings to inform a reusable design guide for future automation projects
- Served as first technical resource for the Nexa IoT platform from inception, installing and managing initial sensor infrastructure across a live facility, leading early-stage validation, and coordinating with the sensor vendor as the project grew into a full internal platform
- Applied GD&T across multi-component valve assemblies to identify critical dimensions, demonstrating 10% better worst-case assembly performance through adaptive tolerance allocation compared to uniform tolerancing

Trader Joe's

Newton, MA

Section Leader (Crew Member)

March 2018 – April 2020

- Led team operations for groups of up to 6, covering inventory, logistics, merchandising, and section leadership
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Leadership Development

United States Naval Sea Cadet Corps

2011-2016

- Achieved rank of Petty Officer Third Class (PO3); completed multiple advanced training programs in seamanship, navigation, and leadership over a 5-year commitment beginning at age 13
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Skills

Software & Tools: MATLAB, Python (pandas, NumPy, SciPy), C++, Arduino IDE, HTML/CSS/JavaScript, Git, Linux, Microsoft Office Suite

CAD & Design: Autodesk Inventor, SolidWorks, Creo Parametric, GD&T, tolerance analysis

Engineering: Experimental design, test automation, sensor evaluation, data acquisition, failure analysis, Design of Experiments (DOE), Verification & Validation (V&V), IoT systems

Fabrication: Electro-mechanical prototyping, manual machining, metalworking, TIG/MIG welding, woodworking

Education

Northeastern University

Boston, MA

Bachelor of Science in Physics

May 2024

GPA:3.42/4.00

Technical Projects

- Developed a MATLAB simulation for micro-sealing modeling, independently replicating foundational academic literature to verify accuracy, later porting to a full interactive web application in JavaScript
 - Built and deployed a self-hosted server to run VPN, media streaming, cloud backup, network-wide ad blocking, game servers, and home automation workflows
 - Designed and deployed a self-hosted portfolio site from scratch using a Docker/Caddy stack, using AI-assisted workflows to rapidly prototype and build a fully responsive frontend in HTML/CSS/JavaScript
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Interests

- Fabricating (wood and metal), electronics and networking, circuitry and robots, blacksmithing, fixing or modifying cars, running, weightlifting, cooking, traveling