

ALEXANDER GARDNER

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EDUCATION

Boston University, College of Engineering — Boston, MA <i>Master of Science, Mechanical Engineering — Robotics focus</i>	May 2026
Rice University — Houston, TX <i>Bachelor of Arts, International Relations / Philosophy</i>	May 2014

SUMMARY

Mechanical engineering graduate student with hands-on experience in CAD design (SolidWorks, Fusion 360, OnShape), GD&T-compliant part design, CNC/manual machining, and electromechanical system integration. Comfortable working across the full prototype lifecycle — design, fabrication, circuit integration, and functional testing — with a disciplined, safety-first mindset from prior U.S. Army service in demanding operational environments.

TECHNICAL SKILLS

CAD & Design: SolidWorks, Fusion 360, OnShape, GD&T-compliant drawings

Simulation & Programming: Python, Java, MATLAB, Julia

Manufacturing: CNC milling & turning, manual machining, sand casting, TIG welding

Electromechanical Integration: Circuit design/assembly, sensor & actuator integration, embedded microcontrollers (ESP32), wiring harnesses

Other: Security protocol & government security compliance understanding

Languages: English (fluent), Spanish (advanced), Japanese (elementary)

PROJECT EXPERIENCE

Boston University Robotics Club — Mechanical Engineer / Machinist <i>1st Place & Audience Appreciation Award, Mass Robotics Form & Function 2026</i>	Dec 2025 – May 2026
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- Machined aluminum components on a CNC lathe for a 6-jointed robotic arm, holding tight tolerances for final assembly fit.
- Designed and prototyped a fin-ray adaptive gripper end-effector in Fusion 360 for delicate object handling.
- Assembled and integrated the complete robotic arm for competition, contributing to a 1st-place finish.

SMOC Thermal Regulator — Mechanical & Controls Design

- Designed an aluminum hot-plate assembly with closed-loop temperature regulation via a linear optimal controller.
- Built and wired the electromechanical control circuit, integrating two MOSFETs, an ESP32 microcontroller, precision resistors, and a cooling fan.
- Programmed the temperature-regulation control logic (Shell Multivariate Optimizing Controller) in embedded firmware.

Rotary Vane Pump — Design & Manufacturing

- Machined aluminum pump components using manual and CNC milling, manual lathe, and sand-casting processes.
- Designed pump components and assembly drawings in OnShape, applying GD&T for manufacturability and fit.
- Developed an improved design iteration against specified performance parameters (production volume, fluid type, application), applying DFM principles.

RELEVANT EXPERIENCE

Graduate Research Assistant — RASTIC (Robotics & Autonomous Systems Teaching and Innovation Center), Boston University	2024 – Present
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- Prepared the center for its grand opening and co-designed the RASTIC Certification Program curriculum.
- Trained students on robotics equipment operation and underlying system principles.

Research Engineer — GreenSquare LLC	Jun 2024 – May 2026
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- Researched microbial fuel cell design at a student-led startup.
- Designed, built, and tested the fuel-cell circuit and structural frame.

Lab Intern — BRAIN Center, University of Houston	Jun 2023 – Aug 2023
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- Supported traumatic spine injury (TSI) research; applied electrodes and mapped central nervous system neural signals.
- Built support vector machine (SVM) models in MATLAB for signal classification.

MILITARY EXPERIENCE

Indirect Fire Infantry — United States Army	Mar 2017 – Jul 2020
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- Served in a mechanized mortar platoon at Fort Hood, TX.
- Deployed to Iraq (2018) with a Quick Reaction Force under Operation Inherent Resolve, operating and maintaining equipment under demanding field conditions.

HONORS & AWARDS

Army Commendation Medal, Operation Inherent Resolve (2019) | Expert Marksmanship Badge (2019)