

# STEPHEN JONES

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## Skills

**Robotics & Hardware:** ESP32, Arduino, embedded C/C++, ROS 2 (introductory), PWM control, MOSFET circuits, sensor integration, wireless protocols (Wi-Fi, local web server architecture), wiring & soldering, 3D printing

**Programming:** Python, C/C++, MATLAB, Java, TensorFlow, Scikit-learn, OpenCV, Git/GitHub

**Mechanical & CAD:** SolidWorks, AutoCAD, structural analysis, FMEA, QFD, systems integration, mechatronics

## Education

**Georgia Institute of Technology**

**Aug. 2026 – Dec. 2028 (Expected)**

*Master of Science in Computer Science (Computational Perception & Robotics)*

*Atlanta, GA*

**Georgia Institute of Technology**

**Aug. 2022 – May 2026**

*Bachelor of Science in Mechanical Engineering*

*Atlanta, GA*

## Relevant Coursework

- Machine Learning
- Data Structures
- Differential Equations
- Heat Transfer
- Intro to OOP
- Computing Techniques
- Circuits & Electronics
- System Dynamics

## Experience

**Khanjur R&D**

**Jan. 2026 – May 2026**

*Lead Mechatronics Engineer*

*Atlanta, GA*

- Designed and built a wireless robotic gripper actuated by Shape Memory Alloy (Nitinol) wire in collaboration with Khanjur R&D — replacing bulky motors with a noiseless, high power-to-weight actuator.
- Programmed an **ESP32** to host a local Wi-Fi web server, allowing smartphone-based wireless control of the claw via a custom UI backed by embedded firmware written in C++.
- Implemented **PWM-driven MOSFET** switching circuits to precisely regulate current through the Nitinol wire, controlling heating rate and closure force without overheating the smart material.

**Better Place Drones – XPrize Team**

**Aug. 2024 – Dec. 2024**

*Research Assistant*

*Atlanta, GA*

- Designed a CO<sub>2</sub>-driven blowdown system that pressurized a water tank to deliver a targeted fire-suppression payload.
- Communicated with 5 subteams to design a cohesive product from Solidworks drawings to a proof of concept.
- Optimized payload effectiveness while minimizing size and weight through systemic design iterations.

## Projects

**Computer Vision: Deep Learning for Structural Inspection** | *TensorFlow, Python*

**Aug. 2025 – Dec. 2025**

- Engineered a transfer learning pipeline utilizing a pre-trained **VGG16 CNN** as a feature extractor to identify structural defects in concrete, achieving **99.83% accuracy** on a dataset of 2,000 images.
- Used Principal Component Analysis (PCA) to identify feature redundancies, capturing **95% of data variance** within 104 components and reducing input dimensionality by **80%** to optimize computational overhead.
- Executed unsupervised diagnostics via K-Means clustering to categorize cracks into 3 distinct sub-groups (thick, jagged, and hairline), verifying model robustness and 1.00 precision/recall across all categories.

**Active Control Systems: ABS Braking Simulation** | *MATLAB, Control Theory*

**Jan. 2025 – May 2025**

- Engineered a non-linear 1/4 car model (1300kg) to simulate ABS dynamics by solving coupled differential equations.
- Implemented bang-bang feedback control to optimize wheel slip ( $\approx 0.2$ ) across dry, wet, and icy terrains with 100km/h initial speed.
- Validated system performance for emergency braking, achieving a stopping distance of **14.6m** on dry pavement.

**Autonomous Competition Robot** | *Solidworks, C++, Arduino IDE*

**May 2024 – Aug. 2024**

- Secured **1st place** out of 5 teams in an autonomous performance competition via iterative design and fabrication.
- Used QFD tools like House of Quality and Specification Sheets to design an autonomous competition robot.
- Managed 30+ weekly hours of Solidworks, C++ Coding, fabrication, and report tasks across a team of three.

## Leadership & Extracurricular

**Georgia Tech Varsity Swim & Dive Team**

**Aug. 2022 – Present**

*Team Captain (2024–2025) / NCAA Division 1 Athlete*

*Atlanta, GA*

- Elected Team Captain; managed communication for 60+ teammates and led the men's recruiting process.
- Recipient of the 2024 Brandon Adams Teammate Award for leadership and camaraderie.
- Balance 20+ weekly hours of training/travel while maintaining academic focus in engineering.