

## SOUGHTOUT CHIJOKE JOSEPH

Waco, TX | josephsoughtout@gmail.com | 901-336-8112 | [linkedin.com/soughtout](https://www.linkedin.com/soughtout)

### RESEARCH INTEREST

Robotics & Autonomous Systems • Artificial Intelligence for Robotics • Machine Learning UAV & Mobile Robot Navigation • GPS-Denied Localization & State Estimation Robotics Simulation (Isaac Sim, Webots, Gazebo) • Multi-Agent Systems Energy-Aware Planning & Decision-Making • Embedded & Real-Time Robotic Systems

### EDUCATION

#### Baylor University — Waco, TX

B.S., Electrical & Computer Engineering

August 2025 – May 2028

#### University of Memphis — Memphis, TN

B.S., Electrical & Computer Engineering Dean's List 3x

January 2024 – August 2025

**Relevant Coursework:** Calculus I, II, III; Intro to Programming; Intro to EECE; Circuit Analysis I; Digital Circuit Design; Vertically Integrated Project; Ordinary Differential Equations; Linear Algebra; Applied Electromagnetic Fields; Microprocessors; Intro to CS1 (C++); Engineering Ethics; Engineering Design.

### RESEARCH EXPERIENCE

#### Undergraduate Research Assistant | Baylor University

August 2025 – Present

#### Advanced Vehicle Intelligence and Autonomy (AVIA) Lab | Waco, TX

- Built a multi-drone simulation framework (PX4, Gazebo, ROS 2, MAVSDK) scaling to 9+ concurrent autonomous drones on Ubuntu 24.04
- Developed live drone spawning and unique per-drone flight behaviors without simulation restart
- Designed and benchmarked multi-agent task allocation algorithms (Hungarian, greedy sequential, round-robin), validating a 53% win-rate advantage across 200-trial simulations
- Co-authored a research paper proposing a unified closed-loop navigation framework — published at AIAA SciTech 2026
- Simulating autonomous robots and UAVs using NVIDIA Isaac Sim, Webots, Gazebo, and high-fidelity platforms
- Developing energy-aware path planning and RTH functionality; integrating regulatory compliance into UAV autonomy

#### Undergraduate Student Researcher | University of Memphis (Jacobs Sensor Lab)

September 2024 – July 2025

- Led the dismantling, optimization, and reassembly of UAV systems to improve flight stability and aerodynamic efficiency
- Designed and implemented distributed system algorithms for multi-sensor integration using C++ and Python
- Integrated a custom sensor module for environmental data acquisition and real-time UAV diagnostics
- Conducted Navy-sponsored research on artificial rain testing to evaluate UAV performance under precipitation
- Enhanced drone responsiveness by ~30% in wet-weather operations through real-time firmware development
- Developed scalable frameworks for UAV data collection and processing with an emphasis on cost efficiency and fault tolerance
- Evaluated nozzle systems and rainfall profiles; collected and analyzed flight data to assess UAV reliability in artificial rain environments

### PRESENTATIONS, PUBLICATIONS & CONFERENCES

• Prell, R., Rubio, R., Joseph, S., Negash, N., & Sun, L. (2026). *A Decision-Making Framework for Autonomous Aerial Vehicles in Responding to GPS Loss*. In Proceedings of the AIAA SciTech Forum 2026, American Institute of Aeronautics and Astronautics. DOI: [10.2514/6.2026-1992](https://doi.org/10.2514/6.2026-1992).

• “Dismantling and Rebuilding Drones Using ArduPilot: A Research Perspective,” Poster Presentation, NSBE Technical Research Exhibition (TRE), 2025, and Honors College Research Forum, University of Memphis, 2025.

Peer Reviewer · AIAA SciTech Forum 2027 · Intelligent Systems Technical Committee

### GRADUATE PREPARATION & LEADERSHIP PROGRAMS

#### Black in AI | Emerging Leaders in AI (ELAI) Graduate Preparation Program

August 2025 – December 2025

- Selected as 1 of 162 participants from 816+ applicants for the Emerging Leaders in AI (ELAI) Graduate Preparation Program (Black in AI)
- Completed structured training for PhD and research-focused Master's admissions in AI and related fields
- Received mentorship in research readiness, advisor alignment, and graduate application strategy
- Collaborated with a global cohort of emerging AI researchers focused on equity and impact in artificial intelligence

#### Microsoft | Emerging Leaders for College Students Program (ELCSP)

August 2025 – October 2025

- Selected through a competitive review of 1,300+ applicants for the Emerging Leaders for College Students Program (ELCSP) led by Microsoft
- Participated in an asynchronous leadership development cohort with curated sessions on leadership, influence, storytelling, and career readiness
- Developed professional and leadership skills aligned with technology, security, and early-career growth pathways

#### FOCUS Scholar — Georgia Institute of Technology FOCUS Scholars Program (2025)

January 16th - 17th 2025

- Graduate school preparation program featuring research exposure, faculty interaction, and insights into PhD pathways

#### Selected Participant — Consider Cornell (Virtual, 2025)

June 27th, 2025

- Graduate school preview and recruitment program focused on doctoral research opportunities and graduate student life

#### Kauffman FastTrac — Baylor Innovation & Economic Development

October 2025– December 2025

- Trained in venture development through the Kauffman FastTrac program hosted by Baylor IE&D
- Learned systematic approaches for validating markets, sizing opportunities, and designing sustainable business models
- Practiced startup finance fundamentals, including unit economics, pricing, and cost structure modeling
- Refined storytelling and pitching around technology-driven innovation
- Leveraging program insights toward commercialization paths in robotics and autonomy

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## AWARDS, HONORS, AND GRANTS

- Baylor University Transfer Baylor Scholarship, 2025,2026
- Baylor Need-Based Grant, 2025,2026
- Dr. Kwang & Sangwol Lee Scholarship — Baylor University, 2025,2026
- Event Program Participant Scholarship — Baylor University, 2025,2026
- A.A & Majorie Hyden Endowed Scholarship — Baylor University, 2026
- International Merit Scholarship — University of Memphis 2024,2025
- Black Scholar Inductee — University of Memphis, 2025
- National Society of Collegiate Scholars (NSCS)Inductee — University of Memphis, 2024
- Certificate of Appreciation — University of Memphis, Academic Enhancement Learning Center Tutor (2025)

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## INDUSTRY / WORK EXPERIENCE

### Founder | CTRL Decode - Remote

*July 2025 to present*

- Founded a personal media brand to decode tech, AI, and robotics news for the younger generation
- Create engaging weekly posts using storytelling, memes, and clear breakdowns
- Building a presence on LinkedIn and Instagram to make tech more accessible

### Office Assistant Earle Hall | Baylor University - Waco, TX

*August 2025 to December 2025*

- Welcomed residents/visitors and managed front desk operations
- Assisted with check-ins/outs, mail, and maintenance requests
- Answered calls/emails and directed inquiries to the right departments
- Maintained organized records and handled confidential information responsibly
- Supported hall staff with event logistics and daily administrative tasks

### Astrodynamics intern | Space Technology & Aeronautical Rocketry (STAR)-Remote(India)

*June 2025 – July 2025*

- Simulated the full space-mission lifecycle: orbital launch, translunar injection, and lunar landing trajectory design
- Applied orbital mechanics, Keplerian elements, and spacecraft dynamics using NASA's GMAT (General Mission Analysis Tool)
- Presented mission design reviews and authored a final engineering report demonstrating trajectory optimization and delta-V budgeting
- Gained practical experience in space mission planning, rocket subsystems, and space-flight mechanics through hands-on, problem-based learning

### Engineer Intern | Mitsubishi Chemical Group / Center for Applied Earth Science and Engineering Research (CAESER) Memphis, TN

*May 2024 to July 2024*

- Assisted with drone and sensor testing, data collection, and processing in the Jacobs Lab.
- Gained hands-on experience in language analysis and the social science side of STEM at the Languages Across Cultures program.
- Utilized portable X-ray Fluorescence instruments to scan materials and study geochemical responses in the Stinchcomb Lab.
- Collected and analyzed water and soil samples for microplastic research.
- Conducted groundwater sampling and hydrologic measurements, and observed drilling operations for CAESER.
- Demonstrated flexibility and adaptability in dynamic environments, with effective communication and teamwork skills

### Front Desk Assistant | University of Memphis

*December 2024 to July 2025*

- Managed 24-hour conference housing desk, including weekends and evening shift
- Facilitated check-in and check-out process, distributed and collected keys.
- Responded to emergencies and performed additional duties as needed
- Supported residence life coordinators, graduate assistants, and assistant directors in daily activities

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## TEACHING EXPERIENCE

### Academic tutor for the Academic Enhancement Center | University of Memphis,

*September 2024 to December 2025*

- Assisted students with homework assignments across multiple STEM disciplines.
- Provided one-on-one tutoring in math-related subjects, including calculus, algebra, and geometry.
- Offered guidance in physics concepts, helping students understand mechanics, electricity, and magnetism.
- Tutored engineering topics.
- Tailored teaching methods to fit individual learning styles for maximum comprehension.
- Fostered academic success through clear communication and patience.

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## VOLUNTEER AND OUTREACH

### Technical Mentor | MIT Beaver Works Summer Institute (BWSI) Build a CubeSat Challenge

*December 2025 – April 2026*

- Selected as a Technical Mentor for the MIT Beaver Works Summer Institute (BWSI) Build a CubeSat Challenge.
- Mentoring multidisciplinary student teams in CubeSat systems design, software, and systems engineering
- Supporting teams through bi-weekly technical sessions focused on mission design, subsystem integration, and problem-solving
- Engaging with MIT BWSI aerospace and autonomous systems curricula and Lincoln Laboratory-connected research community.

### Shark Tank Innovation Judge — Midway High School | Waco, TX

*October 30th, 2025*

- Selected as a judge to evaluate high-school entrepreneurship pitches, business models, and innovation proposals in partnership with Baylor University's Innovation Program.
- Provided structured feedback on feasibility, clarity, and execution while mentoring students on improvement strategies.

### Judge — FIRST Tech Challenge (FTC) League Tournament (Central Texas, 2025)

*January 17th, 2026*

- Judged competitive high school robotics teams on technical merit, design rationale, programming strategy, and autonomous performance.
- Delivered feedback to support engineering communication, iteration, and team development; collaborated with the Judge Advisor and event staff to determine awards and advancement.

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## PROJECTS

- Ultrasonic Radar System (C++, Arduino, Embedded Sensing, Real-Time Control)

Built a rotating ultrasonic radar with real-time object detection and distance visualization; achieved  $\pm 1$  cm accuracy and 10 Hz update rate.

- **AM Signal Generator (MATLAB Simulink)**

Designed and implemented an amplitude modulation system with real-time parameter control and live waveform visualization using Simulink dashboards.

- **Wind Chill Temperature Subsystem (MATLAB Simulink)**

Created a validated reusable subsystem that computes wind chill temperature based on input air temperature and wind speed; applied block-level mathematical modeling and debugging.

## **SKILLS / COURSES**

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- **Programming:** C, C++, Python, MATLAB, Verilog

- **AI & Optimization:** Deep Learning, Large Language Models (LLMs), Prompt Engineering, Multi-Agent Systems, Combinatorial & Black-Box Optimization, Active Learning, Task Allocation Algorithms (Hungarian Method)

- **Embedded Systems:** PX4 SITL, Gazebo, ROS 2, MAVSDK, ArduPilot, NVIDIA Isaac Sim, Webots

- **Tools & Software:** PyTorch, TensorFlow, Altium Designer, KiCad, VS Code, FreeCAD, Microsoft Azure, Linux, Git, Overleaf/LaTeX, Debuggers, Logic Analyzers, Microsoft Office

- **Hardware:** PCB Design, Soldering, Signal Processing, Robotics, Power Management

## **EXTRACURRICULARS & LEADERSHIP**

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- Executive Vice President — National Society of Collegiate Scholars (NSCS), 2025

- Secretary — American Institute of Aeronautics and Astronautics (AIAA), 2025

- Secondary Officer — IEEE Student Chapter (University of Memphis), 2024–2025

- Senator — National Society of Black Engineers (NSBE), 2026–Present

- Member — Bear AI, Baylor University, 2025–Present

## **CERTIFICATION & PROFESSIONAL CREDENTIALS**

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- Astrodynamics Certification — Space Technology & Aeronautical Rocketry (STAR), Aug 2025

- Build a Computer Vision App with Azure Cognitive Services — Microsoft, Dec 2024

- Deep Learning with PyTorch: Image Segmentation — Coursera / University Partnership, Dec 2024

- Designing Hardware for Raspberry Pi Projects — Johns Hopkins University (Coursera), Dec 2024

- Python Data Structures — University of Michigan (Coursera), Dec 2024

- Programming for Everybody (Getting Started with Python) — University of Michigan (Coursera), May 2024

- Membership Certificate — National Society of Collegiate Scholars (NSCS), 2025

- Kauffman FastTrac — Baylor Innovation & Economic Development, Dec 2025

- AWS AI Practitioner Challenge — AWS AI & ML Scholars Program (AWS x Udacity), June 2026