Jacob Blevins

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EDUCATION

Georgia Institute of Technology, Atlanta, GA

- PhD – Mechanical Engineering: Robotics & Control — *May 2022 – Expected: Dec 2026*
- MS – Computer Science: Machine Learning — *May 2024 – Expected: Dec 2026*
- MS – Mechanical Engineering: Design — *August 2020 – May 2021*
- BS – Mechanical Engineering — *August 2016 – May 2020*

RESEARCH & PUBLICATIONS

In Progress

- Learning affine transformation-based perfectly undetectable false data injection attacks for general systems
- Reward as Observation: Learning Reward-based Policies for Rapid Adaptation

Completed

- J. Blevins and J. Ueda, "Encrypted Model Reference Adaptive Control With False Data Injection Attack Resilience via Somewhat Homomorphic Encryption-Based Overflow Trap," in *IEEE Transactions on Industrial Cyber-Physical Systems*, vol. 3, pp. 262-272, 2025
- Jacob Blevins, Amit Jariwala. "Leveraging AI Chatbots in Makerspaces: Enhancing Learning and Collaboration." *ISAM*, 2024.
- J. Ueda and J. Blevins, "Affine Transformation-Based Perfectly Undetectable False Data Injection Attacks on Remote Manipulator Kinematic Control With Attack Detector," in *IEEE Robotics and Automation Letters*, vol. 9, no. 10, pp. 8690-8697, Oct. 2024.
- H. B. Kwon, S. Kosieradzki, J. Blevins and J. Ueda, "Encrypted Coordinate Transformation via Parallelized Somewhat Homomorphic Encryption for Robotic Teleoperation," 2023 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), Seattle, WA, USA, 2023, pp. 228-233.

PROJECTS

- Domain Randomization for Robot Locomotion — *Spring 2025*
  - Utilizing deep reinforcement learning and domain randomization for robust quadruped locomotion in novel environments
- Robust Adversarial Learning for Multiagent Systems — *Spring 2025*
  - Multiagent deep reinforcement adversarial learning for coordinated motion planning under attacked environments.
- NVIDIA Open Hackathon: Language to Action — *Spring 2025*
  - Llama3.2 paired with YOLOworld to auto generate and execute code for pathing and control commands from human language. i.e. tell your robot what to do and it will do it!
- Building a Vision-Based Object Tracking Model for Autonomous Vehicles — *Sept 2024 – Dec 2024*
  - Development of a vision-based deep perception model for object detection and tracking in road-way scenarios for autonomous vehicles.
  - A study on how variations in model architecture such as the addition of attention or encoder-decoders affect final inference for this task.
- Autonomous Mobile Robot via Machine Learning — *May 2024 – July 2024*
  - PPO, YOLOv8, K-means, and other ML algorithms collaborating to guide a Turtlebot3 through an unknown environment
- RoboJackets - RoboNav Mars Rover Software Team — *April 2024 – Present*
  - Motion planning subteam – Development of path planning and control for a mars rover with an NVIDIA Jetson Orin Nano for traversal over complex terrain for the 2025 University Rover Competition
- Liquid Sloshing Reduction via Input Shaping — *Nov 2023*
  - Input shaping of crane, double-pendulum, liquid system, reducing system modes to 5% of their original magnitude, saving factory workers from hazardous liquid sloshing

EMPLOYMENT HISTORY

- *Georgia Institute of Technology – Associate Academic Professional* — *Dec 2024 – Present*
  - Lecture System Dynamics, Experimental Methods, and Computing Techniques
  - Integrate ML techniques into the mechanical engineering curriculum, helping students understand how they can use data science to solve complex engineering problems
  - Manage undergraduate research and tutoring programs, bringing students to their full academic potential
- *Georgia Institute of Technology – Graduate Teaching Assistant and Researcher* — *August 2020 – Present*
  - Research on security of networked robotic systems (see research & publications section)
  - Teaching and advising mechanical engineering laboratory focusing on heat transfer, thermodynamics, signals, systems ID, controls, IC engines, and refrigeration
- *Georgia Institute of Technology – Lab & Facilities Coordinator* — *May 2021 – Nov 2024*
  - Teaching lab-based courses focusing on design, manufacture, and technical communication
  - Management and design of Georgia Tech's mechanical engineering course labs, resulting in state-of-the-art machine and equipment availability and quality workflow for thousands of students and design teams
  - Training students on fabrication machinery, tools, and safety
- *AC & DC Power Technologies – Mechanical Engineer* — *May 2020 – Aug 2020*
  - Design and Analysis of energy storage systems via AutoCAD drawings and MATLAB for validating failure modes
  - MATLAB programing of application for creating detailed customer power-load charts
- *Caterpillar (CAT) Large Power Systems Division – Large Engines Intern* — *May 2019 – Aug 2019*
  - Large engine head fatigue testing, measurement, and temperature data analysis

- *Panasonic Automotive - Advanced Engineering Intern* *May 2018 – Aug 2018*
  - Redesigned and optimized the kinematics system of a General Motors Heads Up Display (GM HUD)
  - Lead the communications with suppliers as the key product engineer during the procurement of prototype parts
- *Georgia Institute of Technology – Fluid Mechanics Grader and Statics Tutor* *Jan 2018 – Dec 2019*

TECHNICAL SKILLS

- *Robotics* – ROS2, MuJoCo, Gazebo, RoboDK, IsaacSim, OpenAI Gym, OpenCV
- *Programming* – Python, C/C++, MATLAB/Simulink
- *Machine Learning* – Pytorch, SciKit Learn, Tensorboard, PACE (Georgia Tech's GPU cluster)
- *Design and Manufacturing* – CAD, 3D Printing, Laser cutting, Water Jetting, Metalworking, Woodworking, Welding

SERVICE & ORGANIZATIONS

Organizations

- FIRST Robotics Workshop Lead *Spring 2025*
- IEEE Robotics and Automation Society graduate student member *Aug 2024 – Present*
- RoboGrads at Georgia Tech *Aug 2024 – Present*

Professional Contributions

- Reviewer, *International Conference on Robotics and Automation* *Sept 2023, Sept 2024*
- Reviewer, *Modeling Estimation and Control Conference* *March 2024*

Georgia Institute of Technology Contributions

- Interactive Learning Committee – Mechanical Engineering *Aug 2022-Present*
- Undergraduate Curriculum Committee – Mechanical Engineering *Spring 2025-Present*
- Idea to Prototype Mentor Spring 2025

HONORS & AWARDS

- GWW School of Mechanical Engineering Professional Support Excellence *May 2024*
- GWW School of Mechanical Engineering Culture Champion *May 2023*
- Highest Honors – Georgia Institute of Technology – GPA: 4.0 *Aug 2016 – May 2020*
- Eagle Scout (Boy Scouts of America) *June 2013*

EXTRACURRICULARS

- Music – Atlanta Symphony Orchestra bass vocalist and jazz vocalist
- Fitness – Nationally competitive powerlifter, certified personal trainer, and CrossFit athlete
- Other – PC and keyboard building, wood turning, juggling, unicycling, piano, and guitar