

# KIET ANH TRAN

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## OBJECTIVE

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I am seeking an opportunity in robotics or mechanical engineering with a focus on mechanical design, mathematical modeling, control, and autonomous systems. I aim to leverage my background in robotics, control theory, and mechanical design to develop innovative solutions for complex robotic systems and advance research in automation and intelligent machines.

## SKILLS

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**Software:** MATLAB, Python, CUDA, LabVIEW, Microsoft Office, CATIA v5, SOLIDWORKS, Fusion 360, Eagle.

**Hardware & Prototyping:** 3D printing, CNC machining, PCB soldering, Arduino, Raspberry Pi, embedded system integration.

### Mechanical & Robotics Engineering:

- Mechanical design & analysis: kinematics, dynamics, mechanism design, stress & tolerance analysis
- Control & automation: PID, MPC, mechatronics system design, sensor integration
- Robotics & simulation: forward/inverse kinematics, trajectory planning, ROS, Gazebo, Simulink

## WORK EXPERIENCE

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### Research Thesis – Vine Robot Control | Johns Hopkins University, Advisor: Dr. Jin Seob Kim | June 2025 – Current

- Modeled vine-like continuum robots using Cosserat rod theory and biologically inspired growth dynamics.
- Developed simulations to optimize robot–wall interactions and predict the robot's deformation during contact.
- Applied a Model Predictive Path Integral (MPPI) controller to enable real-time control.

### Research Intern | Vietnam Academy of Science and Technology | July 2023 – July 2024

- Developed a **vision-based traffic sign detection and tracking pipeline**, training a deep learning model and integrating **DeepSORT** for persistent multi-object tracking across video streams.
- Implemented an **acoustic perception module** using a CNN-based vehicle sound classifier, enabling environment awareness under low-visibility conditions where camera sensing degrades.
- Integrated perception, planning, and control components into a unified **ROS2-based autonomous driving system**.

### Research Assistant | Applied Optics Lab | West Lafayette, IN | January 2022 - May 2023

- Designed and fabricated lab research equipment using SOLIDWORKS, CAM, and 3D printing.
- Developed a waterproof enclosure for an immersed biosensor and conducted water-resistivity tests.
- Created a modular photonic testbed with custom adapters for sensor calibration and testing.
- Performed calibration tests to validate sensor compatibility and performance across different applications.

## PROJECTS

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### Imitation Learning based controller for flexible guidewire navigation | October 2025 – December 2025 | 1<sup>st</sup> Prize

- Developed an imitation learning–based control framework for deformable catheter navigation, enabling autonomous steering without relying on explicit kinematic or dynamic models.
- Designed and integrated a physical experimental platform including a soft catheter, linear actuation stage, and syringe-driven pressure system for real-world validation.
- Validated the controller in hardware experiments, demonstrating stable trajectory tracking in confined environments.

### Solar Tracking Panel Project | January 2023 - May 2023

- Researched solar tracking panel as a possible solution for improving efficiency of solar panels.
- Conducted market analysis to generate engineering requirements for final products.
- Sketched and simulated stress deformation of final design structure using SOLIDWORKS.
- Built and tested moving and charging function of final solar panel prototype.

## EDUCATION

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JOHNS HOPKINS UNIVERSITY | Baltimore, MD

**Master of Science in Mechanical Engineering** | Expected 05/2026 | GPA: 3.65/4.00

PURDUE UNIVERSITY | West Lafayette, IN

**Bachelor of Science in Mechanical Engineering** | 05/2023 | GPA: 3.58/4.00

Minor: Mathematics