ANGELA VOO

(443) 365-8035 | ahv35@cornell.edu | https://www.linkedin.com/in/angela-voo/

EDUCATION

Cornell University, College of Engineering, Ithaca, NY **Expected May 2025**
Bachelor of Science, Mechanical and Aerospace Engineering GPA: 3.690

RELEVANT COURSEWORK

Core Courses	Robotics-Related Courses	Other
Statics	Foundations of Robotics	Dimensional Tolerancing
Dynamics	Model-Based Estimation	Object-Oriented Programming and Data Structures
Mechanics of Materials	Machine Learning	Computer Systems Programming (C/C++) (Spring 2025)
Mechatronics	Robot Perception (Fall 2024)	
System Dynamics	Theory of Linear Systems (Fall 2024)	
Thermodynamics	Autonomous Mobile Robots (Spring 2025)	
Fluid Mechanics	Human-Robot Interaction (Spring 2025)	
Heat Transfer		

ENGINEERING EXPERIENCE

Autonomous Systems Lab, Cornell University - *Undergraduate Research Assistant* **Feb 2024 – Present**

- Adapted the EKF for relative motion object tracking algorithm for stereo camera object detection
- Implemented an Extended Kalman Filter for object-tracking of an autonomous vehicle at a traffic intersection simulated with Jackal robots and using motion capture data for position
- Expected Spring 2025: develop algorithm for path following and/or path planning for the same scenario

General Atomics Aeronautical Systems, Poway, California – *Load and Dynamics Intern* **Jun – Aug 2024**

- Reanalyzed the load and dynamics for the MQ-9A (remotely piloted aircraft) for a higher weight and different payload configurations, using NASTRAN, ZAERO, and internally developed MATLAB tools

Cornell Racing Project Team (FSAE Electric), Cornell University - *Mechanical Engineer* **Sept 2021 – Feb 2024**

- Designed drivetrain mounting optimized for weight and strength through structural analysis and testing, motor and chain scatter shield design, general drivetrain and engine bay integration
- Designed the riveted and welded sheet metal battery pack case for the electric racecar, integrating with internal electrical components and cooling, satisfying safety requirements and load cases, and halved fabrication time
- Assisted with the mechanical layout and packaging of the internal electrical components of the battery pack
- Designed parts for sheet metal bending, laser cutting, waterjetting, subtractive manufacturing, 3D printing
- Presented design through multiple design reviews and documented design process, testing, and results in reports
- Machined parts using the mill and lathe, and tig welded aluminum and steel parts

Creative Engineering, Bronxville, NY - *Mechanical Engineering Design Intern* **Jun – Aug 2023**

- Designed models for 3D printing and rapid prototyping, as well as injection molding for early product development
- Developed system of policy documents and secure computer to support Controlled Unclassified Information work
- Designed elegant but manufacturable hand weight designs and sourced manufacturers
- Wrote a product requirements document (PRD) and created prototype for a helmet load-offset system for a military contractor

Johns Hopkins University Applied Physics Laboratory, Laurel, MD - *Mechanical Engineering Design Intern*
Jun – Aug 2022

- Designed and built a large stand for a set of nulling coils, adjustable for two preset orientations, to cancel the

Earth's magnetic field to test the magnetometer for the NOAA Space Weather Follow On program
- Designed a rigid fixturing structure for successful vibration and flight tests of a custom antenna array
- Designed a tensile test setup and fixturing for different form factors of titanium alloy within a sealed forming gas environment to test hydrogen embrittlement, for the NASA Dragonfly mission: fly a rotorcraft on Saturn's largest moon
- Ordered COTS parts and submitted mechanical drawings for in-house manufacturing for each of the above projects as well as outsourced manufacturing

Jun – Aug 2021

- Created mechanical drawings for machined fittings, tubes, and sheet metal for the NASA ASTHROS high-altitude scientific balloon
- Selected appropriate hardware and fasteners to structural assemblies

Johns Hopkins University Applied Physics Laboratory, Laurel, MD - *Biomechanics Intern* **Jun – Aug 2019**

- Created an algorithm in MATLAB to automate finding the focus depth of a holographic image taken of rodent brains with a lensless camera using image analysis techniques, and then integrated it into a GUI

FIRST Robotics Competition Team 2537: Space RAIDers **Sep 2017 - Apr 2021**

- Mechanical Team Lead (4th year) – led mechanical team in developing a new training program during COVID
- Mechanical Sub-team Lead (3rd year) – led sub-team of five rookies in designing and building a cascading telescoping mechanism with a hook and winch system for the robot to lift itself on a bar during competition
- Mechanical Sub-team Lead (2nd year) – led a sub-team of four members in building a mechanical arm with a sprocket and chain system that performed consistently during every competition
- Rookie Member (1st year) – helped design and build a reliable cascading elevator mechanism and winch system for the robot to lift itself on a bar during competition and continue to World Championships

PROJECTS

Robot Perception Final Project, Cornell University **Dec 2024**

Simulated a drone equipped with a pan-tilt camera to track a car moving along various paths (linear, circular, spiral) in real time. Implemented a Linear Quadratic Regulator (LQR) for drone control and a motion planning algorithm based on the Ackerman steering model to predict the car's trajectory and guide the drone to maintain optimal camera alignment. Evaluated tracking performance using metrics like rise time and settling time.

Robot Perception Midterm Project, Cornell University **Oct 2024**

A pinhole camera model is used to explore the field of view (FOV) dependency on focal length, pan angle, and tilt angle. The trajectory of a stationary object is also shown as it would look on the image plane from the pan or tilt of the camera. A fixed camera from above looking down at the ground tracks an Ackerman-steered car with wheel-base of 4 m driving in a swirl trajectory at 0.5 m/s. The camera is positioned 20 m above the ground with a focal length of 85 mm and an image plane with width and height of 50 mm.

Model-Based Estimation Final Project, Cornell University **May 2024**

Implemented an Extended Kalman Filter(EKF) on a non-linear dynamic model for localization of a robot driven by an Arduino coded in C that follows a path dependent on a color sensor, on top of a tri-colored square board. The robot, modeled as a two-wheeled car with a caster wheel, tracks the states x, y, V and theta. The EKF uses IMU measurements (linear acceleration and angular velocity) with corresponding sensor noise and GPS measurements simulated by adding noise to sub-sampled motion capture data. To address IMU drift, bias states for acceleration and angular velocity were added.

Foundations of Robotics Final Project, Cornell University **Dec 2023**

A simulation of a robot arm picks up the items on an airport conveyer belt and put them in certain places. In this system, the particle filter or the predefined target pose gives the target for the robot to go to. The planner then computes a path from start to goal, which is sent to the controller to execute the trajectory. Inverse kinematics is used to convert the target pose in cartesian space to the joint space that the planner works in. In a simulation of a

scenario where there is a dying patient in an emergency room, an autonomous ground vehicle (AGV) that uses a particle filter for localization and a planner to plan the path, is tasked to save her life by delivering medicines from other rooms to extend her life and call the doctor.

McMaster Designathon 2022 **4 – 6 Mar 2022**

Created a conceptual design for a commercial transit spacecraft interior outfitted for a mission to Mars – 1st place

National Designathon 2021 **15 – 16 May 2021**

Designed a vibration isolating base to prevent damage to the MX-GCS turret when it is under fire, considering vibration, impact loading, and the protection of sensitive elements like lenses and sensors

University of Ottawa Designathon 2021 **13 – 14 Feb 2021**

Designed a small ROV fitted with LiDAR and sonar sensors for objection detection, to be used by first responders to determine shape/size of potentially dangerous objects in unclear and possibly contaminated water – 3rd place

University of Toronto Designathon 2021 **5 – 7 Feb 2021**

Designed a Pfizer vaccine container to maintain temperatures below 2-5 degrees, incorporating an electronic temperature sensor for logging temperature and geolocation data

McMaster University Designathon 2021 **30 – 31 Jan 2021**

Designed an autonomous machine with a syringe dispenser to prepare and administer the Pfizer vaccine

SKILLS

3D Modeling: Autodesk Inventor & Vault (PDM), PTC Creo & WindChill (PLM), SolidWorks, Onshape, 3D printing

Other: MATLAB, Simulink, Python, Java, Bash, ROS, A*, RRT, feedback control, PID tuning, embedded systems programming, C, C++, GD&T, ANSYS FEA structural analysis, HTML, Excel

Certified SolidWorks Associate in Mechanical Design - Obtained Jan 2021