Vincent Trosky

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EDUCATION

ILLINOIS INSTITUTE OF TECHNOLOGY, CHICAGO, IL

B.S. in Mechanical Engineering August 2019 - July 2024

M.S. Autonomous Systems and Robotics August 2022 - July 2024

- Relevant Courses: Optimal Control, Modern Control Systems, Computer Vision and Image Processing, Engineering Analysis, Data-Driven Modeling, Dynamics (x2), Mechanics of Solids (x5), Thermodynamics (x2), Fluid Mechanics, Data Structures & Algorithms
- Organizations: NCAA D-3 Men's Volleyball, Armour Student Council

HOCHSCHULE MÜNCHEN, MUNICH, GERMANY March 2022 - August 2022

Study Abroad Summer Semester

- Relevant Courses: Heat & Mass Transfer, Aerospace Control Systems

EXPERIENCE

Research Assistant December 2023 – Present

Nonsmooth Robotics Lab Chicago, IL

- Designed and assembled a spring-actuated mini bipedal robot with single-link legs and developed a closed-loop control system.
- Publishing the open-source design, assembly, and control documentation, including details on how to integrate servo and BLDC motors, ultrasonic sensors, an IMU, and eventually OptiTrack's camera-based optical tracking system.
- Implementing an optimal control algorithm that minimizes power consumption over varying terrain elevations.

LiDAR and Propulsion Lead August 2023 – Present

Illinois Tech EcoCAR Chicago, IL

- Processed data from LiDAR (OS1-128), INS, and GPS sensors to support autonomous localization algorithms for a Cadillac Lyriq.
- Implemented PCL algorithms in ROS 2 to recognize distinct cluster shapes including cylindrical bodies during intersection navigation.
- Performed structural FEA on motor cradle mounts and custom drive shafts and optimized each for NVH.

Applications Engineering Intern May 2023 – August 2023

DMG Mori USA Hoffman Estates, IL

- Designed and manufactured a spinning top on an DMG Mori NLX 2500 lathe, reducing cycle time using NX CAD/CAM.
- Developed an iterative closest point (ICP) program in Python for probing cycles on a Rolls-Royce single crystal turbine blade.
- Completed tool assembly and work holding for a hydraulic aircraft manifold project.

Project Engineering Intern October 2022 – May 2023

Dimension Inx Chicago, IL

- Synthesized and manufactured the first ever FDA-cleared 3D-printed biomaterials for bone graft applications in the human body.
- Designed and developed a powder-saline mixing syringe to improve product shelf life from two days to five months.
- Evaluated mechanical properties of 3-D printed biomaterial and microstructure combinations to ensure human tissue compatibility.

Vice President/Propulsion Lead August 2019 – May 2023

Illinois Tech Hyperloop Chicago, IL

- Oversaw Autodesk Fusion360 design efforts on suspension, structures, and electromechanical propulsion systems.
- Managed the assembly of a single-seater hover pod capable of traversing across an aluminum floor using rotary induction motors.
- Coordinated the fabrication and procurement of components on Spring 2021 hyperloop pod and 400-ft. test track.

PROJECTS

- **Reinforcement Learning Path Planning**: Developed a Q-learning algorithm to find the shortest path through randomly generated mazes. Utilized OpenCV libraries to analyze each maze and update Q-tables which eventually converged on an optimal solution.
- **Bio-Inspired Robot**: Designed and manufactured a tree-pangolin-inspired robot to scale a 10-ft. wooden pegboard using primarily FDM 3-D printed materials, MDF board, an Arduino Uno, and two continuous servos.

SKILLS

- CAD/CAM (Solidworks, Inventor, Fusion360, NX) | Python | C++ | MATLAB | Simulink | Java | OpenCV | ROS 2 | 3-axis turning | 3+2 axis milling | FEA (Structural) | 3-D Printing (FDM/Biomaterials) | Technical Writing (LaTeX)

HONORS

Duchossois Leadership Scholars Program

- Full-ride scholarship program awarded to students with outstanding academic ability, strong leadership potential, and exceptional communicational skills.