Anh Tung Ho

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Education

Stony Brook University — **Sep 2024 – Present**
Ph.D. in Mechanical Engineering, GPA: 4.0/4.0 — Stony Brook, New York, USA

Korea Advanced Institute of Science and Technology (KAIST) — **Mar 2020 – Feb 2024**
B.Sc. in Mechanical Engineering, Cum Laude Degree, GPA: 3.7/4.0 — Daejeon, South Korea

Experience

The Soft Flyers Laboratory — **Sep 2024 – Present**
Research Assistant | Advisor: Prof. William Stewart — Stony Brook, NY, USA

- Utilized Machine Learning for hardware design optimization of fixed-wing UAVs to enhance safety in human-UAV collisions. The new design reduced the injury by 28% compared to the original. (Result)
- Developed software to automate Finite Element Analysis (FEA) crash simulation, enabling end-to-end loop for design optimization and validation process.

LG Electronics — **Apr 2024 – Aug 2024**
Robotics Engineer — Gyeonggi, South Korea

- Led team (6 people) to develop an AI-driven manipulation system for automating OLED screen defect inspections.
- Designed digital twin model for system including XY gantry, 7-DOF robot arm, and 3D vision systems.
- Developed a vision-based motion planning algorithm with Move It 2 based on deep-learning object detection results.

Luxolis AI — **Feb 2024 – Aug 2024**
Robotics Engineer — Gyeonggi, South Korea

- Completed the initial prototype of low-cost portable RGB-D camera for real-time 3D scene reconstruction.
- Optimized Visual-Inertial SLAM pipeline, reducing data storage by 5x and improving render speed by 10x.

Smart Manufacturing Systems Laboratory — **Jun 2023 – Feb 2024**
Research Assistant | Advisor: Prof. Huitaek Yun — Daejeon, South Korea

- Developed an autonomous bin-picking system with Doosan 7-DOF manipulator, pneumatic gripper system and RGB-D camera with integration of deep learning vision model for object detection. (Video, Code)
- Proposed a multi-view matching algorithm to improve the precise of object pose estimation with a single low-cost RGB-D camera by 70% compared to tradition methods and ensure the error within 2mm.

Robotic and Simulation Laboratory — **Sep 2022 – Dec 2022**
Research Intern | Advisor: Prof. Doo Yong Lee — Daejeon, South Korea

- Researched nonlinear control theory in teleoperated surgical robots interacting with uncertain environments.
- Designed mock surgical experiment with Kuka 7-DOF manipulator, F/T sensor and Omega haptic device.
- Developed an adaptive model-mediated controller that ensures stability even the presence of communication delay and increases fidelity in rendering feedback force by 50% compared to previous publication. (Report)

Delta X Robotics — **Jun 2022 – Sep 2022**
Robotics Engineer Intern — Danang, Vietnam

- Designed Simulink models to analyze dynamics for high-speed parallel delta robots and quadrupedal robots. (Video)

Innovation Design Optimization Laboratory — **Dec 2021 – Mar 2022**
Research Intern | Advisor: Prof. Ik Jin Lee — Daejeon, South Korea

- Conducted research on applying machine learning and Bayesian models to optimize the hardware design in uncertain conditions.
- Utilized Kriging-Gaussian interpolation to create surrogate model which optimizes the design for crashworthiness test of vehicle side impact. The design minimizes the deformation due to side impact while maintaining the required weight.

Publication

"Utilizing Multiple Point Cloud Scenes for Precise Robotic Bin-Picking Tasks", *Anh Tung Ho*, Pung Kyu Lee, Huitaek Yun, *The Korean Society of Mechanical Engineers Spring and Autumn Conference, 2024.*

Selected Projects (Full Portfolio)

SpaceX Rocket Booster Landing Simulation (Video, Code) **2024**

- Created a physics engine for 3D rigid body dynamics with GUI to simulate SpaceX booster landing process.
- Designed feedback Linear Quadratic Regulator (LQR) and Model Predictive Controller (MPC) for whole body control.
- Leverage Reinforcement Learning method Soft Actor Critic of Baselines3 to train policy for autonomous navigation.

Capstone Design for Autonomous Hovercraft (Video, Code) **2023**

- Led team (5 people) to design an autonomous Lidar-based hovercraft controlled by cushion-air mechanism.
- Developed a feedback LQR controller with data from sensor fusion algorithm to optimize thrust and lifting force generated from BLDC motors, ensuring seamless motion on low-resistance air.

AI-Driven Autonomous Racing Car Tournament (Video, Code) **2022**

- Led a team of six to build an autonomous racing car controlled by a Jetson Nano, achieving first place in contest.
- Developed Lidar-Visual path planning algorithm for obstacle avoidance, achieving 30Hz real-time computational rate.

Honors and Awards

- Outstanding Academic Achievement Award in Spring Semester **2022**
- Third Prize in Vietnamese National Physics Olympiad **2018**
- Honor Prize in Vietnamese National Physics Olympiad **2017**

Relevant Courses

Advanced Dynamics, Modeling and Control System, Automatic Control, Robotics System Programming, Kinematics and Dynamics in Robotics, Ariel Robotics, Mobile Robotics, Computer Vision, Signal and Image Processing, Basics of AI and Deep Learning, Introduction to Reinforcement Learning, Mechanical Component Design, Smart Factory for Human-Machine Collaboration, Circuit Theory

Skills

Programming: C/C++, Python, MATLAB

Frameworks: ROS/ROS 2, MoveIt, Gazebo/Simulink/PyBullet, LS-DYNA, SolidWorks/Fusion 360, Pytorch, OpenCV, Open3D/PCL, Git, Linux, Rasberry Pi/Jetson Nano/Arduino, AWS

Referees

Prof. William Stewart
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