Dong Heon Han

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EDUCATION

Georgia Institute of Technology, Atlanta, GA August 2021
Bachelor of Science, Mechanical Engineering GPA: 3.50/4
Atlanta Metropolitan State College, Atlanta, GA December 2018
Associate of Science, Physics GPA: 3.95/4

WORK EXPERIENCE

Visiting Research Assistant Aug 2021 – Dec 2021
Seoul National University, Seoul, South Korea

- Worked as a project leader in ORED lab developing an algorithm for a tractor's autonomous path tracking algorithm.
- Assisted a week-long tractor system's noise/vibration test by using Simcenter Testlab's digital signal processing.

Heat Transfer Tutor May 2021 - Aug 2021
Georgia Institute of Technology, Atlanta, GA

- Taught Georgia Tech undergraduates in a tutoring program sponsored by Shell Oil Company and Air Products Corporation.

Undergraduate Researcher, Project leader of VIP (Vertically Integrated Projects) Sep 2019 – Aug 2021
Georgia Institute of Technology, Atlanta, GA

- Led a team in the LIDAR lab controlling, designing, and optimizing a humanoid robot's neck.
- Integrated the robot's neck with its upper body and completed a kinematic simulation using MATLAB and Drake.
- Explored the robot's high-fidelity motion and control for a contact-rich manipulation task using linear actuators.

Research Intern May 2018 - Aug 2018
KIMM (Korea Institute of Machinery and Materials), Daejeon, South Korea

- Involved in developing a new technology using GPS, IMU, LiDAR, and cameras which let agricultural and construction machines perform path planning, particularly in the open field.
- Used C++ programming and Simulink to manage signals from environmental recognition sensors.

Physics I Undergraduate Teaching Assistant Jan 2018 - May 2018
Atlanta Metropolitan State College, Atlanta, GA

- Assisted students in labs and classrooms with coursework and the professor with grading assignments.

PROJECTS

Seoul National University, Artificial Intelligence Project for an Autonomous Agricultural Vehicle
Project Leader Aug 2021 – Dec 2021
"Development and Implementation of a Tractor's Path Tracking Algorithm Based on Dynamic Target Control"

- Developed a high-level autonomous path tracking algorithm for a self-driving tractor.
- Used dynamic target control to decrease the error of the tractor's head angle and the distance from the desired path.
- Used Object-oriented programming in both C++ and MATLAB to implement the path tracking algorithm.
- Applied machine learning method to optimize the tractor's path tracking feedback and to increase target accuracy.

Georgia Tech, ME 4056 – Senior Capstone Design

Analytics Branch Leader May 2021 – Aug 2021

"Blower Tip's Variable Nozzle Design Sponsored by TTI (Techtronic Industries)"

- Creatively designed a variable nozzle for a DIY homeowner that reduced the cross-sectional area of the nozzle's tip.
- Conducted the CFD to find out what effect the nozzle prototypes' head loss had on the velocity of the wind and the CFM flow rate.
- Checked whether the variable nozzle could withstand 5,000 cycles of opening and closing, using S-N diagram and the max stress found by the FEA.

Georgia Tech, Undergraduate Research Project

Project Leader Jan 2021 - May 2021

"Computer-Aided Manufacturing and Dynamic Analysis of a Six Degree of Freedom Stewart Platform Manipulator"

- Conducted an inverse and forward kinematics of a six degrees of freedom Stewart Platform manipulator.
- Performed PID tuning through the Simulink's system ID and controlled the duty cycle of the linear actuators that were used for the humanoid robot's neck.
- Designed a circuit for the Stewart platform with an Arduino MEGA, P16 actuators, and motor drivers.
- Produced a simulation program using MATLAB based on the kinematic analysis and developed controlling algorithm in Arduino that synchronized 6 manipulators.

Georgia Tech, ME 4042 – Interactive CAD & CAE

Project Leader Aug 2020 - Dec 2020

"Structural Analysis of Horizontal-axis Wind Turbine base on CFD and FEA"

- Modeled the complex design of the wind turbine's blade using S809 airfoil on Siemens NX.
- Obtained the lift and drag coefficients that change according to the velocity of wind by conducting CFD.
- Found the blade's maximum stress and deformation that vary depending on the blade's web design and materials and calculated the factor of safety.

LEADERSHIP EXPERIENCE

Drone Club, President Aug 2018 - Dec 2018

Atlanta Metropolitan State College, Atlanta, GA

- Established the drone club and led the group as the president.
- Designed and built an Arduino-controlled quadcopter drone, while also developing a code that controls the 4 motors stabilizing the drone.

AWARDS

VIP Innovation Competition - 1st Place in Hardware, Devices & Robotics Track April 2021

- Awarded to the most innovative and active research team in Georgia Tech. Received award as a member of LIDAR's Athena team.

President's Undergraduate Research Awards (PURA) Jan 2021

- Received scholarship stipend as an undergraduate student who is conducting research with a Georgia Tech faculty member or a Georgia Tech Research Institute scientist.

Georgia Korean American Grocers Association (GA KAGRO) Scholarship Award Dec 2016

- Was awarded scholarship for academic excellence and community leadership.

SKILLS

Programming: Java (advanced), Arduino (advanced), C++ (advanced), Python
Software: MATLAB (advanced), SolidWorks (advanced), Siemens NX (advanced), ANSYS, LabView
Technical Skills: FEA, CFD, Circuit Design, Machine Learning

PUBLICATIONS

Dong Heon Han.; Seo Jung Byeon.; Kyeong-Dae Kim.; Gyu Ha Han.; Moo Hyun Cha.; Young-Jun Park. Development of Path Tracking Control Algorithm for Tractor Autonomous Driving. Proceedings of the Korean Society for Agricultural Machinery Conference, 2021