

## Dong Heon Han

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Website: <https://dongheonhan.github.io/website/>

### EDUCATION

#### Georgia Institute of Technology, Atlanta, GA

Bachelor of Science, Mechanical Engineering

August 2021

GPA: 3.50 / 4

#### Atlanta Metropolitan State College, Atlanta, GA

Associate of Science, Physics

December 2018

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

### 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