

## Dong Heon Han

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### EDUCATION

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

### WORK EXPERIENCE

<b>Visiting Research Assistant</b>	Aug 2021 – Dec 2021
<i>Seoul National University, Seoul, South Korea</i>	
<ul style="list-style-type: none"><li>Worked as a project leader in ORED lab developing an algorithm for a tractor's autonomous path tracking algorithm.</li><li>Assisted a week-long tractor system's noise/vibration test by using Simcenter Testlab's digital signal processing.</li></ul>	
<b>Heat Transfer Tutor</b>	May 2021 - Aug 2021
<i>Georgia Institute of Technology, Atlanta, GA</i>	
<ul style="list-style-type: none"><li>Taught Georgia Tech undergraduates in a tutoring program sponsored by Shell Oil Company and Air Products Corporation.</li></ul>	
<b>Undergraduate Researcher</b> , Project leader of VIP (Vertically Integrated Projects)	Sep 2019 – Aug 2021
<i>Georgia Institute of Technology, Atlanta, GA</i>	
<ul style="list-style-type: none"><li>Led a team in the LIDAR lab controlling, designing, and optimizing a humanoid robot's neck.</li><li>Integrated the robot's neck with its upper body and completed a kinematic simulation using MATLAB and Drake.</li><li>Explored the robot's high-fidelity motion and control for a contact-rich manipulation task using linear actuators.</li></ul>	
<b>Research Intern</b>	May 2018 - Aug 2018
<i>KIMM (Korea Institute of Machinery and Materials), Daejeon, South Korea</i>	
<ul style="list-style-type: none"><li>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.</li><li>Used C++ programming and Simulink to manage signals from environmental recognition sensors.</li></ul>	
<b>Physics I Undergraduate Teaching Assistant</b>	Jan 2018 - May 2018
<i>Atlanta Metropolitan State College, Atlanta, GA</i>	
<ul style="list-style-type: none"><li>Assisted students in labs and classrooms with coursework and the professor with grading assignments.</li></ul>	

### PROJECTS

<b>Artificial Intelligence Project for an Autonomous Agricultural Vehicle</b>	Aug 2021 – Dec 2021
<i>"Development and Implementation of a Tractor's Path Tracking Algorithm Based on Dynamic Target Control"</i>	
<ul style="list-style-type: none"><li>Developed a high-level autonomous path tracking algorithm for a self-driving tractor.</li><li>Simplified tractor's model based on the bicycle driving model and developed steering control algorithm.</li><li>Used PID control to decrease the error of the tractor's head angle and the distance from the desired path.</li><li>Used Object-oriented programming in both C++ and MATLAB to implement the path tracking algorithm.</li><li>Applied machine learning method to optimize the tractor's path tracking feedback and to increase target accuracy.</li></ul>	
<b>ME 4056 – Capstone Design</b>	May 2021 – Aug 2021
<i>"Blower Tip's Variable Nozzle Design Sponsored by TTI (Techtronic Industries)"</i>	
<ul style="list-style-type: none"><li>Creatively designed a variable nozzle for a DIY homeowner that reduced the cross-sectional area of the nozzle's tip.</li><li>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.</li><li>Checked whether the variable nozzle could withstand 5000 cycles of opening and closing, using S-N diagram and the max stress found by the FEA.</li></ul>	

## Undergraduate Research Project

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 and.

## ME 4042 – Interactive CAD & CAE

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 a \$1,500 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

## PRESENTATIONS

**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. Presented at the 47<sup>th</sup> Korean Society for Agricultural Machinery meeting, Jeju, South Korea, October 27<sup>th</sup> – 30<sup>th</sup>, 2021