Sanghyun Hahn

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EDUCATION

Seoul National University (2020.02 ~ Present)

Department of Mechanical and Aerospace Engineering

Seoul Science High School (2017.03 ~ 2020.02)

GPA: 4.16/4.30

RESEARCH INTERESTS

Autonomous Driving, SLAM, Computer Vision, Machine Learning

RESEARCH EXPERIENCE

RPM Robotics Lab. (2023.06 ~ 2024.06)

Advisor: Ayoung Kim

LiDAR–Thermal HUSKY UGV Platform (2023)

- Hardware development for LiDAR–Thermal camera system on HUSKY UGV
- LiDAR, thermal camera, HUSKY UGV setup via ROS
- LiDAR–Camera Calibration
- Data collection for SLAM

Quantitative 3D Map Accuracy Evaluation Hardware and Algorithm for LiDAR SLAM (2024)

- Target based accuracy evaluation for 3D point cloud maps generated by SLAM
- Algorithm development for target segmentation and error calculation
- Introduced absolute & relative error metrics

EXTRACURRICULAR EXPERIENCE

SNU Baja/FormulaE Student Team RunToYou (2020~2021)

Baja Powertrain Team Leader (2021)

- Frame design and simulation via SolidWorks
- Frame construction, Engine wiring, and more hardware development

KSAE Baja Participant (2020)

AWARDS & HONORS

The National Scholarship for Science and Engineering (2020 ~ Present)

SNU Student-Directed Education Undergraduate Research Program (2024)

PUBLICATIONS

"Quantitative 3D Map Accuracy Evaluation Hardware and Algorithm for LiDAR(-Inertial) SLAM"
Sanghyun Hahn, Seunghun Oh, Minwoo Jung, Ayoung Kim, Sangwoo Jung
Accepted to ICCAS 2024: https://www.arxiv.org/abs/2408.09727

SELECTED COURSES

Aerospace Engineering

- Solid Mechanics, Thermodynamics, Dynamics, Aerodynamics, Control Theory, Jet Propulsion, Compressible Fluid Flow, Space Dynamics, Sensor Systems

Mathematics

- Calculus, Linear Algebra, Stochastic Processes

Programming

- Math for Deep Neural Networks, Machine Learning Theory, 3D Computer Vision

PROJECTS

3D Scene Interpolation via Gaussian Splatting (2024.6)

- Novel view synthesis via 4D Gaussian Splatting (3D-GS + Gaussian Deformation Network)
- Introduced a novel loss term: Blended Gaussian Loss
- Outperformed the baseline model

Initial Kernel Estimation for Image Deblurring (2023.12)

- Deblurred images are a combination of the original image and the blurring kernel
- Obtained the blurring kernel via MAP estimation with gaussian priors
- Initializing the kernel via neural network enhanced the deblurring performance

OceanGate Titan Analysis (2023.12)

- ANSYS simulation for the OceanGate Titan Implosion
- Simulated effects of thermal shock and vertical impact

SNUGLITE-I Tracking (2023.6)

- Tracking cube satellite via GPS position data
- Keplerian Orbit Element estimation via MATLAB

Steady Flow Simulation for NACA 4-digit Airfoils

- EDISON simulation for different NACA 4-digit airfoils
- Grid refinement tests for optimum simulation
- Simulations for analyzing the effect of digits in NACA 4-digit Airfoils

Optimum Patterns of Lattice Structure for Tensile Test (2021.06.)

- SOLIDWORKS Analysis for tensile testing
- Simulations for lattice structure design