GHANGHOON "WILL" PAIK

State College, PA **Phone: 814-441-4804** **Email: ghanghoonp@gmail.com**

RESEARCH PROJECTS

Human Robot Interaction Research **Jan 2022 - Present**

- Collaborated on Interactive and Collaborative Robot Assist Project
  - Built a robot controlled by **ROS** with camera vision with real time video streaming via **GStreamer**
  - Setup **Raspberry Pi** to capture and stream real time video to collect data
  - Controlled robots to perform human robot interaction during simulated condition

Autonomous Robotics Competition Club **Aug 2020 - Present**

- Participated VFS Design-Build-Vertical Flight Student Competition **2021 and 2022**
  - Won **Best Computational Simulation Award** **2021**
  - Won **1st place** in preliminary report **2022**
  - Developed trajectory for the quadcopter and vision system using Intel RealSense and Pi camera through **ROS**
  - Collaborated in quadcopter structure, power, and electronic systems design and testing
- Participated in 29th Annual Intelligent Ground Vehicle Competition **2022**
  - Designed and built autonomous ground vehicle that can carry up to 20 lbs of payload

Astrodynamics Research Group of Penn State **Jan 2017 - Present**

- 9th and 10th Global Trajectory Optimization Competition **2017 and 2019**
  - Collaborated on developing graph **search algorithm** for minimizing cost of the mission
  - Collaborated on developing **optimized trajectory design** and searching optimal timing for mission design
- Student Competition for the 2017 AAS/AIAA Astrodynamics Specialist Conference **Aug 2017**
  - Developed power, onboard electronic, and communications for lander and orbiter for Asteroid (469219) 2016 HO3

NASA Thermal and Fluid Analysis Workshop **Aug 2015**

- Poster presenter at the workshop
  - Developed a thermal model of Avionics vault for a satellite to Jupiter's moon via COMSOL

Korean American Scientists and Engineers Association, Central PA Chapter **Aug 2015 - Dec 2017**

- Served as **Event Director** of the association and managed Monthly seminars
- Symposium on Research Methodologies in the Big Data Era **May 2016**
  - Served as **Financial Chair** of the symposium
  - Managed and organized the budget for each event from university and outside fundings

Penn State Lunar Lion (*Google Lunar X Prize*, Participated in Propulsion group) **Aug 2012 - Dec 2012**

Student Space Program Laboratory **Aug 2012 - Dec 2013**

EXPERIENCE

HPC Software Consultant at Institute of Computational and Data Sciences at PSU **Jan 2017 - Present**

- Analyzed modules, softwares, and libraries on cluster to find missing/malfunctioning components
- Provided **code analysis** for clients of the Advanced Cyber Infrastructure provided by ICDS at Penn State
- Supported **troubleshooting and optimizing programs** including C/C++, OpenMP, MPI, MATLAB, R, Python, COMSOL, Ansys, and other software packages provided and supported by Legacy and New ROAR clusters
- Supported **Systems Engineering** tasks including monitoring jobs and schedulers on RHEL
- Installed various Open-Source and Licensed Softwares and provided Singularity recipes through Github

Parallel Computing Support Engineer at MathWorks (Internship) **Jun 2021 - Aug 2021**

- Developed parallel computing support packages in bash and MATLAB script
- Led meetings to provide support for HPC implementation all various systems and schedulers
- Tested and customized parallel computing scripts for multiple systems and schedulers
- Documented data and instructions for customized packages for internal and external uses

Graduate Teaching Assistant at Penn State **Aug 2015 - Dec 2016**

- TA in Aerospace Analysis (AERSP 313)
  - Held lecture style office hours (2 hours/week) to help students have better understanding of course materials
- TA in Programming for Engineers with MATLAB (CMPSC 200)
  - Taught three sessions of weekly labs with size of 30 - 60 students and held office hours (4 hours/week)

EDUCATION

Pennsylvania State University, University Park

- **Ph.D Candidate in Aerospace Engineering (ABD)** **Expected: Aug 2022**
  Ph.D Minor in Computational Science
- **M.S. in Aerospace Engineering** **May 2015**
  M.S Minor in Computational Science
- **B.S. in Aerospace Engineering** **May 2013**

COMPUTER SKILL

Programming Skill

C/C++ OpenMP MPI CUDA MATLAB Python SolidWorks COMSOL HPC
Linux Bash Scripting OOP Git Docker/Singularity JIRA/Confluence (Atlassian) ROS

PUBLICATIONS

- **Paik, G.**, Melton, R., "Evaluation of Low-Thrust Synergetic Maneuvers During Planetary Flybys", AAS 21-721, AAS/AIAA Astrodynamics Specialist Conference, Big Sky, MT, August 9-11, 2021
- **Paik, G.**, Melton, R., "Low-thrust Multiple Gravity Assist Missions", AAS 20-527, AAS/AIAA Astrodynamics Specialist Conference, South Lake Tahoe, CA, August 9-13, 2020
- D. Conte, A.M.S. Goodyear, J. A. Reiter, **G. Paik**, G. He, M. Nayyar, M.J. Shaw, J.U. Small, and J.M. Everett, "GTOC 9: Results from the Astrodynamics Research Group of Penn State," Acta Futura, Vol. 11, January 2018, pp. 109-115.
- Reiter, J.A., Conte D., Goodyear, A.M.A., **Paik, G**., He, G., Scarcella, P.C., Nayyar, M., M.J. Shaw, "The Astrodynamics Research Group of Penn State (ARGOPS) Solution to the 2017 Astrodynamics Specialist Conference Student Competition", AAS 17-621, AAS/AIAA Astrodynamics Specialist Conference, Stevenson, WA, August 20-24, 2017.