

GUGYEONG SUNG

(205) 246-1701~ gsung2@tamu.edu

EDUCATION

Texas A&M University, College Station, Texas
Doctor of Philosophy
Mechanical Engineering
GPA: 4.0 / 4.0

Fall 2023 - Present

University of Alabama, Tuscaloosa, Alabama
Master of Science
Mechanical Engineering
GPA: 3.71 / 4.0

Graduated July 2021

University of Alabama, Tuscaloosa, Alabama
Bachelor of Science
Mechanical Engineering
GPA: 3.81 / 4.0
Magna Cum Laude

Graduated December 2019

RESEARCH FOCUS

Research Objective

My ultimate research objective is to address critical tribological challenges by advancing the science of friction and wear through coatings, lubrication strategies, and surface texturing, supported by intelligent system modeling. With a focus on superlubricity and wear reduction, I aim to contribute to solving global energy and sustainability problems by developing tribological solutions that enhance the durability, efficiency, and reliability of mechanical systems across industries.

Research Interests

Tribology, Surface Engineering, DLC Coatings, Lubrication, Superlubricity, Dynamic System Modeling, Control Theory, Intelligent Sensing, Optical Inspection and Metrology, Computer Vision, Artificial Intelligence, Robotics

ACADEMICAL WORK EXPERIENCE

Research Assistant

Summer 2025

Texas A&M University, College Station, TX

- Selected for 2025 Graduate Summer Research Grant program
- Researched diamond-like carbon (DLC) coatings for Electric Vehicles
- Researched AI-driven Laser Surface Texturing (LST) Optimization

Teaching Assistant**Fall 2023 – Fall 2025**

Texas A&M University, College Station, TX

- MEEN 361 Materials and Manufacturing in Design Lab (Fall 2025)
- MEEN 365 Dynamic Systems and Controls Lab (Spring 2023 – Spring 2025)
- MEEN 221 Statics and Particle Dynamics (Fall 2023 & Summer 2024)
- Instructed classes and assisted the professor with class management

Research Assistant**Summer 2024**

Texas A&M University, College Station, TX

- Selected for 2024 Graduate Summer Research Grant Program
- Researched TSV/TGV critical dimension metrology and Inspection

Research Engineer**2021 - 2023**

Yeungnam University, Gyeongsan, Republic of Korea

- Worked at the HRC Lab (Website: hrc.yu.ac.kr)
- Researched a force control method without physical force sensors
- Researched a gait strategy for people with paraplegia wearing powered exoskeletons
- Co-wrote a course textbook (Introduction to Wearable Robotics for People with Disabilities)

Teaching Assistant**Fall 2019**

University of Alabama, Tuscaloosa, AL

- ME 450 Dynamic Machine Components
- Assisted professor with class management

Research Assistant**Fall 2017 – Spring 2018**

University of Alabama, Tuscaloosa, AL

- Modeled rideable drones
- Researched additive manufacturing for magnetic materials

WORK EXPERIENCE

Technical Support**November 2023 - January 2024**

Consumer Electronics Show (CES), Las Vegas, NV

- Worked with IDeA OCEAN Inc.
- Assisted in real-time troubleshooting of hardware and software issues during demonstrations while engaging with industry professionals and clients to explain technical aspects and gather feedback for future development.

Marine Corps Officer**2012 - 2014**

Republic of Korea

- Served as a member of the Anti-Aircraft Artillery
- Helped keep nuclear power plants and ironworks safe from potential air strike threats

RESEARCH EXPERIENCE

Research Assistant

Fall 2023 – Present

Texas A&M University, TX

- Designed a sensorless force tracking algorithm for a milling machine spindle
- Researched the methodology of the wafer defect inspection
- Researched TSV/TGV critical dimension metrology and inspection

Research Assistant

Spring 2019 – Fall 2020

University of Alabama, Tuscaloosa, AL

- Modeled and manufactured a device for an upper torso rehabilitation

Research Assistant

Fall 2020 – Spring 2021

University of Alabama, Tuscaloosa, AL

- Design and implementation of a rehabilitation device for lower limbs

PUBLICATION & CONFERENCE

Journal

- **G. Sung**, K. Kong, and J. Choi*, “What is the Proper Gait Pattern for People with Paraplegia Who Wear Powered Exoskeletons?: Re-examining gait patterns of existing powered exoskeletons,” *IEEE Robotics and Automation Magazine*, 2023
- **G. Sung** and J. Choi*, “Improving Walking Autonomy of People with Paraplegia wearing Powered Exoskeletons,” *IFAC-PapersOnLine*, 56(2), 1127-1132, 2023

Conference

- **G. Sung** J. Lee, H. Chun, and C. Lee*, “3D Imaging Approach to TSV/TGV Critical Dimension Metrology and Inspection,” *ASME 20th International Manufacturing Science and Engineering Conference (MSEC)*, 2025
- J. Lee, **G. Sung**, H. Chun, and C. Lee*, “Particle Inspection by Single Camera-based 3D Stereoscopy,” *ASME 19th International Manufacturing Science and Engineering Conference (MSEC)*, 2024
- **G. Sung**, K. Kong, and J. Choi*, “What is the Proper Gait Pattern for People with Paraplegia Who Wear Powered Exoskeletons?: Re-examining gait patterns of existing powered exoskeletons,” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2023
- **G. Sung** and J. Choi*, “Improving Walking Autonomy of People with Paraplegia wearing Powered Exoskeletons,” *in proc. 22nd IFAC World Congress*, 2023
- **G. Sung**, S. Kim and J. Choi*, “A Quasi-Passive Pneumatic Spring System supporting Quadriceps Muscles,” *in proc. 22nd IFAC World Congress*, 2023
- K. Yu, Y. Shin, **G. Sung**, and J. Choi*, “Force Control without Physical Force Sensors based on Virtual Wall Hypothesis for Development of High-Speed Winding Equipment,” *37th Institute of Control Robotics and System (ICROS)*, 2022 (**Received Best Paper Award**)
- Y. Shin, K. Yu, **G. Sung**, and J. Choi*, “Force Control Algorithm for Maintaining Reaction Force without Physical Sensor based on Disturbance Observer,” *17th Korea Robotics Society Annual Conference (KRoC)*, 2022 (**Best Paper Award Nominated**)

SKILLS

- **Programming:** MATLAB/SIMULINK, LabVIEW, Python, OpenCV
- **Design:** SolidWorks, Illustrator
- **Tools:** LaTeX, Micro Office
- **Language:** English (Fluent), Korean (Native)

CERTIFICATES

IBM Machine Learning Professional Certificate

December 2025

- Credential: coursera.org/professional-cert/BD41MMT9D74U

IBM Introduction to Data Engineering

December 2025

- Credential: coursera.org/verify/CLT2RP0AIZSO

HONORS & INVOLVEMENT

- Selected for **Pioneer Natural Resources Fellowship** for one year by the J. Mike Walker '66 Department of Mechanical Engineering in 2025
- Selected for the **2025 Graduate Summer Research Grant Program** from the J. Mike Walker '66 Department of Mechanical Engineering
- Selected for **C.W. Crawford Fellowship** for one year by the J. Mike Walker '66 Department of Mechanical Engineering in 2024
- Selected for the **2024 Graduate Summer Research Grant Program** from the J. Mike Walker '66 Department of Mechanical Engineering
- **Four-year guaranteed assistantship program** for Ph.D. Program from Texas A&M University
- **President's and Dean's List** from Fall 2017 to Fall 2019
- Recipient of **Award of Distinction Soldier** from the 1st Marine Division Leader
- Member of the Accelerated Master's Program (AMP) for good standing students
- 2025 Korean Student Association **Chief Student Leader** – Texas A&M University
- Catia Club President - Yeungnam University Mechanical Engineering Department
- **Daegu & GyeongBuk Province Representative** in the National Robotic Competition in 2006
- **National Robotic Competition Championship Representative** in Republic of Korea in 2005