Hyunwoo Kwon

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EDUCATION

UNIVERSITY OF ILLINOIS AT URBANA CHAMPAIGN Champaign, IL
B.S. in Mechanical Engineering May 2025
Minor in Computer Science, Minor in Computational Science and Engineering GPA: 3.9/4.0

RESEARCH EXPERIENCE

UNDERGRADUATE RESEARCH ASSISTANT Dec 2022 - Present
Wave Propagation and Metamaterials Laboratory (Advisor: Kathryn Matlack) Urbana, IL

- Optimized piezoelectric-structural coupling through COMSOL finite element analysis, increasing eigenfrequencies from 400 to 600 Hz for the dynamic mechanical analysis setup
- Presented Multiphysics simulation findings at Research Symposium, earning recognition from faculty committee Presented research findings at University Undergraduate Research Symposium through poster presentation
- Currently investigating mechanical behavior of lattice structures with granular media through experimental approach using CT-scanning, quasi-static and dynamic testing

UNDERGRADUATE RESEARCH ASSISTANT September 2024 - Present
Energy Transport Research Lab (Advisor: Nenad Miljkovic) Urbana, IL

- Conducted finite element analysis using Abaqus to validate fin plate deformation under varying loads, validating thermal dissipation experiments
- Developing automated temperature control system through LabVIEW-based PID implementation, integrating thermistor feedback for precise power supply regulation

UNDERGRADUATE RESEARCH ASSISTANT Feb 2024 – Oct 2024
NCSA (Advisor: Volodymyr Kindratenko) Urbana, IL

- Developed a Python-based geometry extraction tool interfacing between Abaqus and NVIDIA Omniverse, enabling real-time beam displacement data integration for digital twin applications
- Presented digital twin model implementation at Trans-IPIC seminar 2024, demonstrating successful integration of FEA results through sensor data

SUMMER RESEARCH ASSISTANT May 2023 – Sept 2023
Mind in Vitro Summer Program (Advisor: Mattia Gazzola) Urbana, IL

- Developed open-source cell culture automation system for biohybrid robotics research, integrating Raspberry Pi-based PID control to achieve peristaltic pump accuracy within 1% and a controllable refresh rate between 1ml/min and 5ml/min

- Presented system validation results to NSF review panel at Mind-in-Vitro program evaluation, demonstrating successful automation of cell culture maintenance

WORKING EXPERIENCE

PVD MODULE EQUIPMENT ENGINEER INTERN May 2024 – Aug 2024

TSMC Phoenix, AZ

- Optimized PVD equipment performance through systematic maintenance protocols and real-time parameter monitoring, ensuring continuous semiconductor fabrication
- Designed optimal pipe routing and chamber configurations for new fab facility using CAD, maximizing space efficiency while meeting cleanroom specifications
- Reduced airborne molecular contamination by 15% through ANSYS Fluent CFD analysis, implementing optimized fan placement based on simulation results

Presentation

Presentations

- NSF Annual Review for Mind in Vitro Project (https://mindinvitro.illinois.edu)
- Undergraduate Research Symposium (Spring 2024)
- Trans-IPIC Seminar Chicago (Spring 2024)

LEADERSHIP AND SERVICE

- Data Science and Artificial Intelligence Society (President) January 2023 – Current