Hansol Lee

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Education

Korea Advanced Institute of Science and Technology (KAIST) Mar. 2022 – Feb. 2024

M.S. Mechanical Engineering | ***GPA**: 4.26/4.3* *Advisor: Prof. Sung Jin Kim*

- **Courses**: Computational Fluid Dynamics, Optimal Design, Phase Change Heat Transfer, Statistical Thermodynamics, Advanced Heat Transfer, Convective Heat Transfer, Advanced Fluid Dynamics, Viscous Fluid Flow

Korea Advanced Institute of Science and Technology (KAIST) Mar. 2015 – Feb. 2022

B.S. Mechanical Engineering | ***GPA**: 3.81/4.3* *Advisor: Prof. Wang-Yuhl Oh*

- **Courses**: Thermodynamics, Fluid Dynamics, Solid Mechanics, Dynamics, Numerical Analysis, Applied Electronics, Circuit Theory, Signals and Systems, Mechanical Vibrations, Heat Transfer, Multidisciplinary Capstone Design, Engineering Design, Applied Fluid Mechanics
- **Honors**: Outstanding Achievement Award (2021), Scientific Writing Competition - Encouragement Award

Research Interest

Investigations to break through thermal bottlenecks for high heat flux electronics including monolithic 3D ICs and wide-band gap (WBG) power semiconductors via embedded microfluidics and thermal-aware designing

Research Experience

Applied Heat Transfer Lab | KAIST Mar. 2022 – Feb. 2024

Graduate Research Assistant (Advisor: Prof. Sung Jin Kim)

- Developed the one-dimensional thermal-hydraulic model of manifold microchannels (MMC) for embedded cooling, considering the effects of the flow non-uniformity on the thermal performance of MMC for the first time
- Developed the compact thermal model of 2.5D/3D Processing-In-Memory (PIM) heterogeneous package for thermal reliability verification, reducing the computational cost by up to 98% compared to the 3D numerical simulation

Applied Heat Transfer Lab | KAIST Jan. 2021 – Feb. 2022

Undergraduate Research Assistant (Advisor: Prof. Sung Jin Kim)

- Conducted the experimental validation of 3D numerical simulation for embedded micro pin-fins
- Developed the in-house code for synchronization of temperature and heat flux distribution in a pool boiling situation

Thermal Radiation Laboratory | KAIST Dec. 2017 – Feb. 2018

Undergraduate Research Assistant (Advisor: Prof. Bong Jae Lee)

- Investigated the machine learning approach to solve inverse heat conduction problems

Publications

- **H. Lee***, Y. J. Lee*, S. J. Kim, One-dimensional model of manifold microchannel heat sinks: Prediction of thermal performance and flow non-uniformity, *International Communications in Heat and Mass Transfer.* (2022 JCR: 4.7%, IF: 7.0) [Link]
- Y. J. Lee*, **H. Lee***, S. J. Kim, Flow non-uniformity regime in manifold microchannels for embedded cooling. *(In progress)*
- Y. J. Lee*, **H. Lee***, C. Hwang, S. J. Kim, Multi-objective performance optimization of manifold microchannels based on multi-fidelity surrogate modeling approach *(In progress)*

*First co-author

Conferences

- One-dimensional modeling of embedded manifold microchannels with plate fins for prediction of thermal performance and flow non-uniformity, ***Korean Society Mechanical Engineering Thermal Engineering Division* (2024 KSME-TED)**, Apr. 2024, Jeju, Republic of Korea
- Thermal performance prediction of liquid-cooled manifold microchannel (MMC) heat sinks with plate fins, ***Korean Society Mechanical Engineering Thermal Engineering Division* (2023 KSME-TED)**, Apr. 2023, Gyeongju, Republic of Korea

Projects

3D Multiporous Cooling System for Ultra-high Heat Flux Applications Mar. 2022 – Feb. 2024
National Research Foundation of Korea (NRF) *PI: Prof. Sung Jin Kim*

- Developed high-efficiency and high-performance 3D multiporous coolers for ultra-high heat flux heating elements
- Conducted a fundamental study for 3D structured-monoporous coolers

Thermal Reliability Verification of 2.5D/3D PIM Heterogeneous Package Mar 2023 – Feb. 2024
Electronics and Telecommunications Research Institute (ETRI) *PI: Prof. Sung Jin Kim*

- Developed the compact thermal model of PIM heterogeneous package for thermal reliability verification
- Designed a heat sink module allowing the normal operation of the PIM heterogeneous package

Awards & Honors

Outstanding Achievement Award Mar. 2021
Department of Mechanical Engineering in KAIST

Scientifc Writing Competition - *Encouragement Award* Mar. 2021
KAIST

Extracurricular Activities

Student Press - Editor in ME Newsletter Apr. 2022 – May. 2023
Department of Mechanical Engineering in KAIST

Start-up Company Internship Jun. 2018 – Dec. 2018
Beflex Inc., Research Assistant *Daejeon, Republic of Korea*

Vice President of KAIST Entrepreneurs Mar. 2018. – Feb. 2019
KAIST K-School

Teaching

Tutoring for Gifted Education Sep. 2021 – Feb. 2022
KAIST Center for Gifted Education

International Freshman Tutoring - General Physics I Mar. 2021 – Jun. 2021
KAIST

Skills

Programming languages: MATLAB, Python, C
Commercial software: ANSYS Fluent, Icepack, SpaceClaim, Inventor, AutoCAD, Illustrator