

Hansol Lee

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SUMMARY

Dynamic and interdisciplinary academic researcher specializing in thermal engineering and electronics packaging. Experienced in both modeling and experimental studies (**a first-author publication in *International Communications in Heat and Mass Transfer*** [2022 JCR: 4.7%, IF: 7.0], three upcoming first-author publications, and two conference presentations). Proven track record of academic excellence, demonstrated by the **Outstanding Achievement Award and National Science & Technology Scholarship**. Skilled in scientific writing, recognized by a **win in the Scientific Writing Competition and a TOEFL writing score of 28**.

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 advanced electronics including AI processors, monolithic 3D Ics, and wide-band gap (WBG) power semiconductors via embedded microfluidics and thermal-aware design strategies

RESEARCH EXPERIENCE

Applied Heat Transfer Lab | KAIST Mar. 2022 – Present

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

- Developed the one-dimensional thermal-hydraulic model of manifold microchannels (MMC) for embedded cooling of high-heat flux electronics, considering the effect 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 individual research project on the calibration of infrared (IR) camera using a black body calibration source
- Developed the in-house code for synchronization of heat flux distribution and temperature distribution on a boiling surface based on IR thermometry

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

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

- Investigated the machine learning approach to efficiently 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***, D. Kong, H. Lee, S. J. Kim, Thermal-hydraulic performance and temperature non-uniformity of embedded (Z-type) manifold microchannels: Theoretical and experimental study. (*In progress*)
- Y. J. Lee*, **H. Lee***, S. J. Kim, Theoretical and experimental investigation to 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

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|---|-------------------------------|
| 3D Multiporous Cooling System for Ultra-high Heat Flux Applications | Mar. 2022 – Feb. 2024 |
| <i>National Research Foundation of Korea (NRF)</i> | <i>PI: Prof. Sung Jin Kim</i> |
| <ul style="list-style-type: none">• 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 including manifold microchannels and micropin-fins | |
| Thermal Reliability Verification of 2.5D/3D PIM Heterogeneous Package | Mar 2023 – Feb. 2024 |
| <i>Electronics and Telecommunications Research Institute (ETRI)</i> | <i>PI: Prof. Sung Jin Kim</i> |
| <ul style="list-style-type: none">• 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

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| Outstanding Achievement Award | Mar. 2021 |
| <i>Department of Mechanical Engineering in KAIST</i> | |
| Scientific Writing Competition - Encouragement Award | Mar. 2021 |
| <i>KAIST</i> | |

PROFESSIONAL EXPERIENCE

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| Military Service | March. 2019 – Oct. 2020 |
| <i>Republic of Korea Army - Capital Artillery Brigade, Administration Specialist</i> | |
| Start-up Company Internship | Jun. 2018 – Feb. 2019 |
| <i>Beflex Inc., Research Assistant</i> | |
| | <i>Daejeon, Republic of Korea</i> |

EXTRACURRICULAR ACTIVITIES

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| Student Press - Editor in ME Newsletter | Apr. 2022 – May. 2023 |
| <i>Department of Mechanical Engineering in KAIST</i> | |
| Vice President of KAIST Entrepreneurs | Mar. 2018. – Feb. 2019 |
| <i>KAIST K-School</i> | |

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

English proficiency: TOEFL 108 (R/L/S/W - 30/26/24/28)