

# Hojin Kim

📍 West Lafayette, IN    ✉ hojin.kim@purdue.edu    🌐 <https://jeenskim.github.io>    in hojin-kim

## Education

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**Purdue University** *IN, United States*  
*PhD in Mechanical Engineering* *Aug. 2025 – Present*  
*Advisor: Assistant Prof. Romit Maulik*

**The Pennsylvania State University** *PA, United States*  
*PhD in Informatics* *Aug. 2024 – Aug. 2025*  
*Advisor: Assistant Prof. Romit Maulik* *(Transfer to Purdue University)*

**Seoul National University** *Seoul, Republic of Korea*  
*MS in Aerospace Engineering* *Mar. 2021 – Feb. 2023*  
*Advisor: Prof. Kwanjung Yee*

**Seoul National University** *Seoul, Republic of Korea*  
*BS in Aerospace Engineering* *Mar. 2015 – Feb. 2021*

## Research Interest

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Computational Fluid Dynamics (CFD), Machine learning, Turbulence, Optimization

## Honors and Awards

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**Purdue Graduate Student Government Travel Award** *West Lafayette, IN, USA*  
Purdue University, USA *Mar. 2026*

**Argonne Training Program on Extreme-Scale Computing (ATPESC)** *St. Charles, IL, USA*  
Argonne National Laboratory, USA *Jul. 2025 - Aug. 2025*  
: Selected participant, intensive program on high-performance computing and scalable algorithms

**Student Travel Award for the 2025 SIAM Conference on Computational Science and Engineering (CSE25)** *Jan. 2025*  
Society for Industrial and Applied Mathematics (SIAM)

**The Ruth Young Boucke Graduate Fellowship** *Aug. 2024*  
**The Robert W. Graham Endowed Graduate Fellowship**  
The Pennsylvania State University, PA, United States

**Merit-based Scholarship** *Spring 2015, Spring 2022*  
Seoul National University, Seoul, Republic of Korea

**Work-study Scholarship** *Fall 2018, Spring 2019*  
College of Engineering, Seoul National University, Seoul, Republic of Korea

## Experience

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### Lawrence Livermore National Laboratory (LLNL)

Graduate Research Intern

Livermore, CA, USA

May. 2026 – Aug. 2026

- Will develop machine learning models for multiphase fluid dynamics simulations
- Will collaborate with researchers on scientific machine learning workflows

## Publication

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**H. Kim**, D. Chakraborty, T. Toki, C. Scalo, R. Maulik (2026). “Multiscale Hypersonic Boundary Layer Reconstruction via Spectral Binning and Subdomain-wise Conditional Diffusion,” *under review*, *arXiv:2606.15023*.

**H. Kim**, R. Maulik (2025). “Towards Interpretable Deep Learning and Analysis of Dynamical Systems via the Discrete Empirical Interpolation Method,” *under review*, *arXiv:2510.21852*.

**H. Kim**, V. Shankar, V. Viswanathan, R. Maulik (2026). “Generalizable data-driven turbulence closure modeling on unstructured grids with differentiable physics.,” *Computers & Fluids*, 318, 107200.

S. Barwey, **H. Kim**, R. Maulik (2025). “Interpretable A-posteriori error indication for graph neural network surrogate models.,” *Computer Methods in Applied Mechanics and Engineering*, 433, 117509.

**H. Kim**, J. Lee, D. Lee, K. Yee (2025). Improved Conceptual Design of eVTOL Aircraft: Considering Rotor-Rotor Interactional Effects. *International Journal of Aeronautical and Space Sciences*, 1-20.

S. Yang, **H. Kim**, Y. Hong, K. Yee, R. Maulik, N. Kang (2024). “Data-driven physics-informed neural networks: A digital twin perspective.,” *Computer Methods in Applied Mechanics and Engineering*, 428, 117075.

## Conference

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### 20th U.S. National Congress on Theoretical and Applied Mechanics (USNC-TAM)

Pasadena, CA, USA

June. 2026

**H. Kim**, R. Maulik

“Generalizable data-driven turbulence closure modeling on unstructured grids with differentiable physics”

### SIAM Conference on Uncertainty Quantification (UQ26)

Minneapolis, MN, USA

Mar. 2026

**H. Kim**, D. Chakraborty, T. Toki, C. Scalo, R. Maulik

“Conditional Diffusion Models for High-speed Boundary Layer Reconstructions”

### 2026 Joint Mathematics Meetings

Washington DC, USA

Jan. 2026

**H. Kim**, R. Maulik

“Interpreting Learned Physics in Neural ODEs through a DEIM-based Spatio-temporal Analysis”

### APS 78th Annual Division of Fluid Dynamics Meeting

Houston, TX, USA

Nov. 2025

**H. Kim**, R. Maulik

“Interpreting Learned Physics in Neural ODEs through a DEIM-based Spatio-temporal Analysis”

### 18th U.S. National Congress On Computational Mechanics

Chicago, IL, USA

Jul. 2025

S. Barwey, **H. Kim**, R. Maulik

“Scalable, interpretable, and explainable scientific machine learning with geometric deep learning”

### 2025 SIAM Conference on Computational Science and Engineering

Fort Worth, TX, USA

Mar. 2025

**H. Kim**, R. Maulik

“Differentiable physics for generalizable closure modeling of separated flows”

### APS 77th Annual Division of Fluid Dynamics Meeting

Salt Lake City, UT, USA

Nov. 2024

**H. Kim**, R. Maulik

“Differentiable physics for generalizable closure modeling of separated flows”

## 48th European Rotorcraft Forum

H. Kim, J. Seo, D. Lee, Y. Hong, K. Yee

“Design Methodology of Urban Air Mobility for Noise Mitigation at the Conceptual Design Stage”

Winterthur, Switzerland

Sep. 2022

## Workshops

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### 2026 AAI XAI4Science workshop

H. Kim, R. Maulik

“Towards Interpretable Deep Learning and Analysis of Dynamical Systems via the Discrete Empirical Interpolation Method”

Singapore

Jan. 2026

### 2025 Purdue CCAM workshop - Scientific Machine Learning: Theory, Algorithms, and Applications

H. Kim, R. Maulik

“Differentiable physics for generalizable closure modeling of separated flows”

West Lafayette, IN, USA

Sep. 2025

### 2025 AAI Bridge Program - Knowledge-Guided Machine Learning

H. Kim, S. Barwey, R. Maulik

“Scalable, adaptive, and explainable scientific machine learning with applications to surrogate models of partial differential equations”

Philadelphia, PA, USA

Feb. 2025

### 2024 AAI Symposium on Integrated Approaches to Computational Scientific Discovery

H. Kim, S. Barwey, R. Maulik

“Scalable, adaptive, and explainable scientific machine learning with applications to surrogate models of partial differential equations”

Arlington, VA, USA

Nov. 2024

## Professional Service

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### Journal Review

Journal reviewer for - Journal of Fluid Mechanics, Journal of Computational Physics, Physics of Fluids