JAEKWANG KIM

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EDUCATION

University of Illinois at Urbana-Champaign, IL *2018 - Present*
Ph.D. in Theoretical and Applied Mechanics
Department of Mechanical Engineering

University of Illinois at Urbana-Champaign, IL *2016 - 2018*
M.S. in Theoretical and Applied Mechanics
Department of Mechanical Engineering

Seoul National University, South Korea *2009 - 2015**
B.S. in Naval Architecture & Ocean Engineering
Graduation with the highest honors

RESEARCH INTEREST KEYWORD

Polycrystalline material, phase-field modeling, multi-scale modeling, data driven reduced-order modeling, Non-Newtonian fluids, complex fluids, numerical analysis, uncertainty quantification

PUBLICATION

Field sensitivity of flow predictions to rheological parameters, J.B. Freund J. Kim, R. H. Ewoldt,*Journal of Non-Newtonian Fluid Mechanics*, Vol 256, 71–82, 2018.

Uncertainty Propagation in Simulation Predictions of Generalized Newtonian Fluid Flows, J. Kim, P. K. Singh, J.B. Freund, R. H. Ewoldt, *Journal of Non-Newtonian Fluid Mechanics*, Vol 271, 104138, 2019.

The non-homogenous flow of a thixotropic fluid around a sphere, J. Kim, J. D. Park, *Applied Mathematical Modeling*, Vol 82, 848–866, 2020.

A thixotropic fluid flow around two sequentially aligned spheres, J. Kim, J. D. Park, *Korean Journal of Chemical Engineering*, Vol 38, 1460-1468, 2021

A crystal symmetry-invariant Kobayash-Warren-Cater grain boundary model and its implementation using a thresholding algorithm, J. Kim, M. Jacobs, S. Osher, N. C. Admal, *Computational Materials Science*, Vol 199, 110575, 2021.

A stochastic framework for evolving grain statistics using a neural network model for grain topological transformation, J. Kim, N. C. Admal, *In preparation.*

Adjoint analysis of viscoelastic fluid flow, J. Kim, *In preparation.*

CONFERENCE

J. Kim, P. K. Singh, J.B. Freund R. H. Ewoldt
Poster, Uncertainty Propagation in Simulation Predictions of Generalized Newtonian Fluid Flows, *Society of Rheology 89th Annual Meeting*, 11 October 2017, Denver, USA.

J.B. Freund, J. Kim, R. H. Ewoldt
Field sensitivity of flow predictions to rheological parameters, *Society of Rheology 90th Annual Meeting*, 16 October 2018, Houston, USA.

J. Kim, M. Jacobs, N. C. Admal
A fast thresholding algorithm for the Kobayashi-Warren-Carter grain boundary model, *2020 Society of Engineering Science*, 29 September - 1 October 2020, Virtual Conference (COVID-19)

*Including 2 years of military service during the program

J. Kim, M. Jacobs, N. C. Admal
A Thresholding Method for the Kobayashi-Warren-Carter Grain Boundary Model with General Mobilities, *16th U.S. National Congress on Computational Mechanics*, 26th July,Virtual Conference (COVID-19)

RESEARCH EXPERIENCE

Research Assistant at Admal Research Group *2019 - Present*
Mathematical modeling and simulations of microstructure evolution in polycrystalline materials

Research Assistant at Freund & Ewoldt Research Group *2016 - 2018*
Uncertainty quantification in simulation predictions of complex fluids

Undergrad Research Intern at Marine Propeller laboratory *2015 - 2016*
Shadow-graphic image analysis to ventilated super-cavities phenomena

TEACHING

Teaching Assistantship
Thermodynamics *Spring 2022*

- Record recitation short lecture videos
- Develop homework problems

Teaching Assistantship
Introduction to Statics *Fall 2020, Spring/Fall 2021*

- Lead discussion sessions (1 time/wk) for 30 students.
- Exam problem develop in *PrairieLearn* online testing/homework platform.
- Prepared in-depth solution procedures to statics problems.

Teaching Assistantship
Introductory Solid Mechanics *Summer/Fall 2019, Spring 2020, Summer 2021*

- Lead discussion sessions (1 time/wk) for 30 students.
- Maintain and add features to online class platform *PrairieLearn* using Python, html, git, and `docker`.
- Hold office hours.

Teaching Assistantship
Fundamentals of Fluid Dynamics *Spring 2019*

- Lead fluid mechanics laboratory sessions (1 time/wk) for 10 students.
- Grading laboratory reports

GRADUATE COURSES

Solid Mechanics: Solid Mechanics 1 (Fundamentals of continuum mechanics), Micro Mechanics of Material, Atomistic Solid Mechanics

Fluid Mechanics: Invicid Flow, Viscous Flow, Instability and Transition, Non-Newtonian Fluid Mechanics & Rheology, Dynamics of complex fluids

Numerical Method: Computational Mechanics, Uncertainty quantification, Advanced Finite Element Method

TECHNICAL SKILLS

Programming	C++, Python, MATLAB, Git, Unix/Linux
Software	`deal.II`, Fenics, TensorFlow, Pytorch, Gmsh, LAMMPS
Documentation & Tools	Latex, Pgfplot, Tikzfigure, Bibtex, Mathematica
Experimental Tools	Rheometer (DHR-3), Electron Microscope (JEOL 7000F)

AWARD

SNUAA Scholarship, Seoul National University Alumni Association in Chicago Area, 2021

The Schaller Travel Award A graduate student funding for participating in a technical meeting/symposium, University of Illinois Graduate College, 2021

Graduation with Honors, Summa Cum Laude., *Ranked No.1 in the department*, President of Seoul National University, South Korea, 2015

National Science & Technology Scholarship, Ministry of Science and Technology, South Korea, 2012–2015.

Member of Seoul National University student honor society, STEM, 2013 - *present*

Excellence Award in Writing in Science&Technology, Dean of College of Engineering, Seoul National University, South Korea, 2013.

Excellence Award in Student Ship Design Competition, Society of Naval Architects, South Korea, 2013.

INTERNSHIP AND EXTRA-CIRRUCULAR

Lab Assistant in social outreach program, Worldwide Youth in Science and Engineering Program, 2020 Summer, 2021 Summer

Industry internship, Samsung Electronics Mechatronics Research Center, *Advanced Technology Research Group*, 2020 Summer

Member of Korean Tennis Club at Champaign District, 2019-2022

Exhibitor, Engineering Open House, *Rheology Zoo*, 2017, 2018

Undergrad Exchange Student, Chemical Engineering Department, Monash University, Australia, 2014

Industry internship, Korea Register of Shipping, 2013 Winter

Military Service, Korea Army Training Center, South Korea, 2010–2012