

Stanford



Makrand Khanwale

Postdoctoral Scholar, Mechanical Engineering

Bio

BIO

I received my PhD from Iowa State University co-majoring in Mechanical engineering and Applied Mathematics. I was co-advised by Dr. Baskar Ganapathysubramanian and Dr. James Rossmannith. For my dissertation I worked on development and analysis of numerical schemes for high fidelity simulations of multiphase flows. Specifically I developed energy stable numerical methods to simulate two-phase flows using Cahn-Hilliard Navier-Stokes equations. I also have experience in development of tools to analyse and understand complex physical processes like multi-phase flows and turbulence. Before joining Iowa State for my graduate work, I had a brief stint as a research associate in Dr. Krishnaswamy Nandakumar's group in Louisiana State University (LSU). At LSU I worked on developing theoretical models for energy cascades in multi-phase flows.

HONORS AND AWARDS

- Research Excellence Award from Iowa State Graduate College, Iowa State University (May 2021)
- Teaching Excellence Award from Iowa State Graduate College, Iowa State University (May 2019)
- Dean's Fellowship from College of Engineering, Iowa State University (2016)
- Bal G. Joshi endowment award, Institute of Chemical Technology (2014)

PROFESSIONAL EDUCATION

- Doctor of Philosophy, Iowa State University , Mechanical Engineering and Applied Mathematics (2021)
- B.Tech, Institute of Chemical Technology , Chemical Technology (2015)

STANFORD ADVISORS

- Parviz Moin, Postdoctoral Faculty Sponsor
- Ali Mani, Postdoctoral Research Mentor

LINKS

- Personal Website: <https://makrandak.github.io/about/>

Publications

PUBLICATIONS

- **Computational framework for resolving boundary layers in electrochemical systems using weak imposition of Dirichlet boundary conditions** *FINITE ELEMENTS IN ANALYSIS AND DESIGN*
Kim, S., Khanwale, M. A., Anand, R. K., Ganapathysubramanian, B.
2022; 205

- **Industrial scale Large Eddy Simulations with adaptive octree meshes using immersogeometric analysis** *Computers & Mathematics with Applications*
Saurabh, K., Gao, B., Fernando, M., Xu, S., Khanwale, M. A., Khara, B., Hsu, M., Krishnamurthy, A., Sundar, H., Ganapathysubramanian, B.
2021; 97: 28-44
- **Simulating two-phase flows with thermodynamically consistent energy stable Cahn-Hilliard Navier-Stokes equations on parallel adaptive octree based meshes** *JOURNAL OF COMPUTATIONAL PHYSICS*
Khanwale, M. A., Lofquist, A. D., Sundar, H., Rossmanith, J. A., Ganapathysubramanian, B.
2020; 419
- **On nature of mass transfer near liquid-liquid interface in the presence of Marangoni instabilities**
Khadamkar, H. P., Khanwale, M. A., Sawant, S. S., Mathpati, C. S.
PERGAMON-ELSEVIER SCIENCE LTD.2017: 176-183
- **Bubble generated turbulence and direct numerical simulations** *Bubble generated turbulence and direct numerical simulations*
Joshi, J. B., Nandakumar, K., Evans, G. M., Pareek, V. K., Gumulya, M. M., Sathe, M. J., Khanwale, M. A.
PERGAMON-ELSEVIER SCIENCE LTD.2017: 26-75
- **Heat Transfer in Turbulent Boundary Layers of Pipe Flow: A Wavelet Transforms Approach**
Khanwale, M. A., Sona, C. S., Mathpati, C. S., Peinke, J., Kampers, G., Oberlack, M., Waclawczyk, M., Talamelli, A.
SPRINGER-VERLAG BERLIN.2016: 221-226
- **Effect of solute transfer and interfacial instabilities on scalar and velocity field around a drop rising in quiescent liquid channel** *PHYSICS OF FLUIDS*
Khanwale, M. A., Khadamkar, H. P., Mathpati, C. S.
2015; 27 (11)
- **Investigation of heat transfer characteristics and energy balance analysis of FLiNaK in turbulent boundary layers of pipe flow** *APPLIED THERMAL ENGINEERING*
Khanwale, M. A., Sona, C. S., Mathpati, C. S., Borgohain, A., Maheshwari, N. K.
2015; 75: 1022-1033
- **Investigation of flow and heat characteristics and structure identification of FLiNaK in pipe using CFD simulations** *APPLIED THERMAL ENGINEERING*
Sona, C. S., Khanwale, M. A., Mathpati, C. S., Borgohain, A., Maheshwari, N. K.
2014; 70 (1): 451-461