VEDANT PURI

https://vpuri3.github.io/

EDUCATION	**Carnegie Mellon University (CMU)**	Jan 2022 Onwards

Ph.D Mechanical Engineering

	University of Illinois Urbana-Champaign (UIUC)	2015–2019

B.S. Engineering Mechanics, Secondary Field: *Fluid Mechanics* — GPA: 3.66/4.00

B.S. Mathematics, Concentration: *Graduate Preparatory* — (dual degree)

Minor: *Computational Science and Engineering*

Thesis: *Direct Numerical Simulation of Flows Over Wavy Walls at* $\mathrm{Re}_\lambda = 4780$

EXPERIENCE

Julia Computing | *Intern Engineer* — April 2021–Present
- Deploying deep learning surrogate models for Partial Differential Equations in JuliaSim
- Developing `DiffMesh.jl`, differentiable geometry representations and meshing algorithms
- Developing numerical PDE solvers that utilize differentiable programming for sensitivity analysis

CoreCompete | *Data Science Trainee* — Jan 2021–May 2021
- Developed logic of conversational AI agent to support collections calls at a financial institution
- Analysis and visualization of inventory forecasting models for an apparels company

Carnegie Mellon University | *Research Assistant* — Sep 2020–Jan 2021
- Wrote `SEM.jl`, a Spectral Element based differentiable PDE solver for machine learning research

Argonne National Laboratory | *Research Assistant* — Mar 2020–Sep 2020
- Computational Fluid dynamics simulations (LES, RANS) of turbulent airflow in urban landscapes
- Mesh generation, setup, comparison studies, and analysis of OpenFOAM, NEK5000 simulations

Argonne National Laboratory | *Research Assistant* — May 2018–Jul 2018
- Fluid dynamics simulations (DNS) of airflow over windfarm terrains on supercomputers
- Analyzed Reynolds stress budgets in canonical flows for turbulence model development
- Developed `NekTools`, a FORTRAN 77 toolbox for post-processing NEK5000 simulations

National Center for Supercomputing Applications | *Intern* — Sep 2017–May 2018
- Initial data generation of spacetime metric for gravitational wave simulations in Einstein Toolkit
- Implemented numerical methods for solving nonlinear elliptic PDEs (preconditioning, relaxation)

Mechanical Science & Engineering, UIUC | *Course Assistant* — Jan 2016–Dec 2017
- Taught mechanical analysis using free-body-diagrams and control-volumes for *Statics* course
- Created instructional demonstrations for engineering courses serving 2500 students annually

RESEARCH

(manuscript in preparation) **V. Puri**, R. Balakrishnan, A. Obabko, P. Fischer, *Turbulent Kinetic Energy Budgets of Flows Over Smooth and Rough Wavy Walls at* $\mathrm{Re}_\lambda = 4{,}780$

(upcoming talk) **V. Puri**, R. Balakrishnan, *DNS and LES of Flow Over Smooth and Rough Wavy Walls.* American Physical Society Division of Fluid Dynamics 2021

(talk) **V. Puri**, R. Balakrishnan, *DNS of Flow Over Smooth and Rough Wavy Walls at* $Re_\lambda = 4760$. American Physical Society Division of Fluid Dynamics 2020

(talk) **V. Puri**, R. Haas, E. Bentivegna, *Initial Data Generation Algorithms for 'Einstein Toolkit'.* American Physical Society April Meeting 2018

ACTIVITIES & AWARDS

UIUC	*Theoretical and Applied Mechanics Merit Award*	2019
Society for Engineering Mechanics, UIUC	*President*	Aug 2018–May 2019
Society for Engineering Mechanics, UIUC	*Curriculum Development*	Oct 2016–May 2018

SKILLS

Programming	FORTRAN 77/90, C/C++, Python, Julia, MATLAB, UNIX, LaTeX
Technologies	Google Cloud Platform, REST API, Postman, Gmsh, Tableau, PETSc, FFTW
Design	Computer aided design, woodworking, soldering, Adobe Lightroom, photography