Vedant Puri

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Education

University of Illinois Urbana-Champaign (UIUC) Aug 2015–Dec 2019
B.S. Engineering Mechanics, Secondary Field: *Fluid Mechanics* GPA: 3.66/4.00
B.S. Mathematics, Concentration: *Graduate Preparatory* (dual degree)
Computational Science and Engineering Minor

Work Experience

Research Aide, **Argonne National Laboratory** Mar 2020–Present
- Project: Wake-recovery past bluff-bodies for Department of Energy *Distributed Wind* project
- Summary: Conducted Large Eddy Simulations of wind-flow over building-like geometries
- Keywords: NEK5000, Gmsh, Reynolds stress budgets, synthetic turbulence generation

Research Aide, **Argonne National Laboratory** May 2018–Jul 2018
- Project: Direct Numerical Simulations for Department of Energy *Offshore Wind* project
- Summary: Analyzed Reynolds stress budgets in canonical flows for turbulence model development
- Keywords: NEK5000, meshing, post-processing, turbulence modelling

Intern, **National Center for Supercomputing Applications** Sep 2017–May 2018
- Project: Initial data generation of spacetime metric for gravitational wave simulations
- Summary: Implemented numerical methods for solving nonlinear elliptic PDEs
- Keywords: Einstein Toolkit, PETSc, FFTW, preconditioning, Scheduled Relaxation Jacobi

Course Assistant, **UIUC Mechanical Science & Engineering** Jan 2016–Dec 2017
- Taught mechanical analysis using free-body-diagrams and control-volumes for *Statics* course
- Conducted 4 weekly discussion sections with 32 students each

Research Work

(manuscript in preparation) R. Balakrishnan,**V. Puri**, S. Haering, *Large Eddy Simulation of Flow Past Wall-Mounted Cube*

(manuscript in preparation) **V. Puri**, R. Balakrishnan, A. Obabko, P. Fischer, *Reynolds Stress Budgets for Turbulent Flows Over Smooth and Rough Wavy Walls*

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

Activities

President, **UIUC Society for Engineering Mechanics** Aug 2018–May 2019
- Led organization of 30 students to pursue engineering projects

Curriculum Development, **UIUC Society for Engineering Mechanics** Oct 2016–May 2018
- Created instructional demonstrations for engineering courses serving 2500 students annually
- Student advisor to Strategic Instructional Innovations Program group for mechanics courses

Honours & Awards

Theoretical and Applied Mechanics Merit Award 2019
UIUC Mechanical Science and Engineering department award in honour of a student's special contributions to Theoretical and Applied Mechanics, and Engineering Mechanics programs

Skills

Programming	FORTRAN 77/90, C, C++, Shell, MATLAB, Python, LaTeX
Software	PETSc, FFTW, Gmsh, Visit, Paraview, Creo Parametric
Miscellaneous	Computer Aided Design, woodworking, soldering, photography

Projects

`https://github.com/vpuri3`
- `/Spec`: Spectral-Element MATLAB code for fluid flow problems; solves incompressible Navier-Stokes equation, advection-diffusion equation in deformed geometries
- `/NekTools`: Preprocessing, postprocessing setup for computing turbulence budgets in computational fluid dynamics code NEK5000 written in FORTRAN 77
- `/IlliniHyperloop`: (UIUC capstone) Passive cooling solution to dissipate 300 kJ heat from propulsion system of Hyperloop pod; fabricated by sponsor, Novark Technologies, Inc.
- `/Notes`: Reference notes for continuum mechanics, real analysis, functional analysis