Siva Viknesh Portfolio Website

Contact Information
Scientific Computing & Imaging Institute,
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Research Interests
Machine Learning, Unsteady Aerodynamics, Wildfire Dynamics, CFD, Wind-Tunnel Measurements

Education

University of Utah, Salt Lake City, Utah, USA

Ph.D., Mechanical Engineering, 08/20/2022 – Present **CPI: 3.88/4**

Advisor: Dr. Amirhossein Arzani

- **Thesis:** *Towards Interpretable & Differentiable Machine Learning for Fluid Flows*
- Formulated a **novel inverse PINN methodology** to infer **unknown time-dependent boundary conditions** in cardiovascular flows.
- Developed a **2D Wildfire Transport Solver** using a GPU-accelerated FDM framework in Python.
- Proposed an improved SINDy-based methodology, **ADAM-SINDy**, for Nonlinear Dynamical System Identification.

Indian Institute of Technology Kanpur, India

M.S., Aerospace Engineering, 01/04/2018 – 07/15/2020 **CPI: 8.33/10**

Advisor: Dr. Kamal Poddar

- **Thesis:** *Control of Separated Flow on a Symmetric Airfoil by Pitching Oscillation*
- Developed a **2D DNS/Implicit LES compressible parallel solver** in Fortran using the FDM framework.
- Conducted **Unsteady Pressure Measurements**, **Hot-wire experiments**, and **Time-resolved PIV experiments** on an oscillating airfoil.

Anna University, Chennai, India

B.E., Aeronautical Engineering, 08/16/2012 – 05/01/2016 **CPI: 8.30/10**

Advisor: Dr. Shanmugaraja M

- **Thesis:** *Numerical Simulation of Fluid Flow over a Rectangular Wing Embedded with Wingtip Slots*

Work Experience

Graduate Student Researcher 05/12/2025 – Present
CCS-2 Group, Los Alamos National Laboratory, New Mexico, USA

- **Statistical Shape Modeling** of DEM terrains for Wildfire simulations.

Aerodynamics Engineer 09/16/2021 – 08/13/2022
The ePlane Company, IIT Madras, Chennai, India

- **CFD URANS simulations** on full-scale 3D electric air vehicles to evaluate aerodynamic performance and static stability.
- Developed **UDF programs** to generate unsteady freestream conditions for calculating **dynamic stability derivatives**.

Senior Research Associate 01/01/2021 – 08/15/2021
Department of Aerospace Engineering, IIT Kanpur, India

- Conducted experimental measurements of fluid flow over an oscillating airfoil wing.

Associate – Content Development 08/28/2020 – 01/15/2021
BYJU'S, Bengaluru, India

CFD Engineer 05/02/2016 – 11/17/2017
FlowXplore - CAE Associates , Coimbatore, India

- Performed **CFD RANS simulations** of **horizontal and vertical axis wind turbines** using the MRF technique.

Publications

1. **ADAM-SINDy: An Efficient Optimization Framework for Parameterized Nonlinear Dynamical System Identification**, **Siva Viknesh**, Younes Tatari, Amirhossein Arzani, Submitted, 2024.
2. **Role of flow topology in wind-driven wildfire propagation**, **Siva Viknesh**, Ali Tohidi, Fatemeh Afghah, Rob Stoll, Amirhossein Arzani, **Physics of Fluids**, May, 2025.
3. **Active control of separated flow on a symmetric airfoil by pitching oscillation**, **Siva Viknesh** and Kamal Poddar, **Physics of Fluids**, August, 2021.
4. **Grid sensitivity and role of error in computing a lid-driven cavity problem**, V. K. Suman, **Siva Viknesh S.**, Mohit K. Tekriwal, Swagata Bhaumik and Tapan K. Sengupta, **Phys. Rev. E**, Jan 2019.

Technical Skills

- PyTorch
- CUPY
- MPI Fortran
- MATLAB
- NI LabView
- Fluent
- CATIA
- ANSA
- Tecplot

Teaching Experience

Teaching Assistant Fall 2024
ME EN 2450 – Numerical Methods for Engineering Systems
Instructor: Prof. James Rob Stoll, University of Utah

Teaching Assistant Spring 2020
AE 698A – Intro to Virtual Instrumentation
Instructor: Prof. Kamal Poddar, IIT Kanpur

Teaching Assistant Fall 2019
AE 351A – Experiments in Aerospace Engineering I
Instructor: Prof. Dehobam Das, IIT Kanpur

Teaching Assistant Spring 2019
AE 698A – Intro to Virtual Instrumentation
Instructor: Prof. Kamal Poddar, IIT Kanpur

Activities & Achievements

- Reviewed research papers for the **Physics of Fluids** journal.
- **President & Admin** of Tamil Club at IIT Kanpur (Jan 2019 – Sep 2021).
- Awarded a **Full Scholarship** for pursuing the M.S. program at IIT Kanpur.
- Achieved All India Rank **141** in GATE AE 2017.
- Achieved All India Rank **540** in GATE AE 2016.
- Secured **Undergraduate University Rank 38** in Tamil Nadu state.
- **Inter-department Chess Champion** at Park College of Technology (2013).