Siva Viknesh

Contact Information	Scientific Computing & Imaging Institute, 72 S Central Campus Dr, University of Utah, Salt Lake City, Utah, USA, 84112	+1 385 528 4611 siva.viknesh@sci.utah.edu sivaviknesh14@gmail.com

Objective

The individual pursuing the Ph.D. program is actively seeking an internship position that offers an opportunity to learn, acquire, and enhance both technical and interpersonal skills.

Research Interests

Machine Learning, Unsteady Fluid Dynamics, Wildfire Dynamics, CFD, Wind-Tunnel Measurements

Education

University of Utah, Salt Lake City, Utah, USA

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

- **Thesis:** *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 finite difference method (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, January 2018 – July 2020 **CPI: 8.33/10**

- **Thesis:** *Control of Separated Flow on a Symmetric Airfoil by Pitching Oscillation*
- Developed a **data-driven aerodynamic model** for a pitching airfoil using a Fourier-based approach.
- Implemented a **2D orthogonal grid generation** code in Fortran.
- Developed a **2D DNS/Implicit LES compressible parallel solver** in Fortran using a finite difference method (FDM) framework.
- Designed MATLAB code to evaluate the **spectral resolution of numerical derivative schemes**.
- Conducted **unsteady pressure measurements**, **hot-wire experiments**, and **time-resolved PIV experiments** on an oscillating airfoil.

Anna University, Chennai, India

B.E., Aeronautical Engineering, August 2012 – April 2016 **CPI: 8.30/10**

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

Work Experience

Aero Propulsion Engineer September 2021 – August 2022
The ePlane Company, IIT Madras, Chennai, India

- Conducted **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 January 2021 – August 2021
Department of Aerospace Engineering, IIT Kanpur, India

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

Associate – Content Development August 2020 – January 2021
BYJU'S, Bengaluru, India

- Developed **Mathematics** content for high school curricula.

CFD Engineer May 2016 – November 2017
CAE Associates – FlowXplore, 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, Submitted, 2024.
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 August 2024 – December 2024
ME EN 2450 – Numerical Methods for Engineering Systems
Instructor: Prof. James Rob Stoll, University of Utah

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

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

Teaching Assistant January 2019 – May 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).
- Secured **1st position** in the **Parachute Design & Performance Competition** at Bannari Amman Institute of Technology, Coimbatore (August 2013).