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 a 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).