# Rishith Kirankumar Vanaliya

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## EDUCATION

**Nirma University, Institute of Technology**, Ahmedabad, Gujarat, India. *2022 – 2026*

- **Major:** Candidate for Bachelor of Technology -Mechanical Engineering - GPA: 9.09/10.0
- **Minor:** Data Science
- **Ranked 2nd** in the Department based on academic performance
- **Relevant Coursework:** Machine Design, Finite Element Analysis, Design & Dynamics of Machines, CFD Fundamentals, Basics of Flight and Aerodynamics, Computer Programming, Machine Learning, Deep Learning, Cloud Computing.

## EXPERIENCE

**Society of Automotive Engineers (SAE) Nirma Collegiate Club - Team Arrow**

**Team Captain, SAE Aero Design West, Team Arrow** (SAE ADW 2025) *Sep 2023 - Apr 2024*

- Led 30+ students in UAV design and fabrication for SAE International. Managed timelines, team roles, and system integration for competition success.

**Team Captain, Technoxian UAV Challenge, Team Arrow** *Sep 2023 - Apr 2024*

- Directed a 10-member team in building a fixed-wing UAV focused on control and aerobatics. Oversaw testing, tuning, and competition readiness.

**Team Mentor, Team Arrow** *May 2025 - Present*

- Guided and mentored a team of 30+ undergraduate students in advanced aeromodelling, fostering collaboration, innovation, and technical excellence.

**Design Lead, DDC Micro, Team Arrow** (DDC 2024) *Aug 2023 - Aug 2024*

- Coordinated the mechanical design and fabrication of an autonomous UAV for the Drone Development Challenge (DDC), guiding a team in CAD modeling, weight optimization, and component integration.

## RESEARCH WORK

**"Physics-Informed Neural Networks (PINNs) for Solving Fluid Flow Problems"**

Research paper accepted at the 12th International and 52nd National Conference on Fluid Mechanics and Fluid Power **(FMFP–2025)**, Nirma University. The study compares Fully Connected and Fourier-based PINNs using NVIDIA's PhysicsNeMo, demonstrating Fourier networks' superior accuracy for laminar lid-driven cavity flow modeling.

## SIGNIFICANT ACADEMIC PROJECTS

**Physics-Informed Neural Network Simulation of Breast Cancer Treatment via Radiofrequency Ablation (RFA)** *(On Going)*

- Integrated Physics-Informed Neural Networks (PINNs) with OpenFOAM to simulate breast cancer treatment through Radiofrequency Ablation (RFA). Modeled tumor response under thermal exposure and optimized RFA parameters for effective tissue destruction and predictive tumor behavior modeling.

**Design & Analysis of Mirco Class Aircraft for SAE Aero Design West 2025** *(Sep 2024 - April 2025)*

- Designed, fabricated, and tested a 1.6 kg micro-class UAV achieving a payload fraction above 0.5 under a 450 W power limit. Ensured short takeoff (<10 ft), high structural integrity, and 5-minute endurance through aerodynamic optimization and validation testing. (SAE ADW 2025)

**Automated CFD Simulation Platform using Flask and OpenFOAM** *(Jul 2025 - Oct 2025)*

- Developed a full-stack web platform automating OpenFOAM CFD workflows on Linux. Integrated Python–Bash pipelines for solver execution (icoFoam) and real-time post-processing, streamlining simulation setup and result visualization.

**Design of Micro Class Fixed Wing Aircraft for Drone Design Challenge** *(Aug 2023 - Aug 2024)*

- Fabricated a 700 g fixed-wing UAV with a 0.72 payload fraction and foldable design fitting within a 3 ft cube. Constructed a balsa–aeroply airframe reinforced with aluminum/acrylic spars and a flite board fuselage for lightweight durability. (DDC 2024)

## TECHNICAL SKILLS

**CAD & Design:** SolidWorks, Fusion 360, CorelDRAW, XFLR5
**Simulation:** Ansys Workbench (FEA), Ansys Fluent (CFD), OpenFOAM, Tecplot, ParaView
**Programming & Tools:** Python, MATLAB, Flask, Tableau, eCalc
**Documentation:** Overleaf, LyX

## HONOURS & AWARDS

- Achieved **11$^{th}$ Overall** and **5$^{th}$ in Mission Score** among 75 international teams at the **SAE Aero Design West 2025 (Micro Class)** (SAE ADW 2025) held at Apollo XI RC Field, Van Nuys, California, USA (April 2025).
- Secured **3$^{rd}$ Position** in the **Micro Class** category at the **SAEISS Drone Design Challenge 2025** (March 2025).
- Achieved **2$^{nd}$ Overall** and awarded **Best Technical Presentation** in the **Micro Class** category at the **SAEISS Drone Design Challenge 2024** (DDC 2024) (September 2024).
- Achieved **2$^{nd}$ Overall** and received **Best Design Report** in the **Mico Class** category at the **SAEISS Drone Design Challenge 2024** (DDC 2024) (July 2023).

## REFERENCES

**Dr. Absar M. Lakdawala**
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**Dr. Rajesh N. Patel**
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