

# Sana Nazir

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PhD researcher developing high-order, hardware-agnostic, performance-portable CFD solvers in C++/Kokkos.

## EDUCATION

### PURDUE UNIVERSITY

MSc AERONAUTICS &  
ASTRONAUTICS

Dec 2022 | USA

MSc COMPUTER SCIENCE

May 2018 | USA

### BSc COMPUTER SCIENCE

Lahore University of  
Management Sciences |  
PAKISTAN

## COURSEWORK

## CONCENTRATIONS

Aerodynamics

Propulsion

Compilers

Networks & Operating Systems

## ACADEMIC PROJECTS

2024 | Identification of Vortex  
Stretching Events in Turbulent  
Channel Flow (JHTDB)

2024 | Hypersonic DSMC Study of  
Hollow-Cylinder-Flare (SPARTA)

2022 | Hydrogen Powered  
Micro-Gas-Turbine

2022 | Ultra High Bypass Ratio  
Geared Turbofan Engine Analysis

2018 | Map Reduce Word Count  
(C++, OpenMP, MPI)

2017 | GCC Compiler Support for  
Analyzing Uninitialized Local/Global  
Variables (C)

2016 | XINU OS Components  
Including Scheduler & Virtual  
Memory Support (C)

## EXPERIENCE

### PURDUE UNIVERSITY | PHD STUDENT | GRADUATE STAFF

- Jan 2023 - present | Teaching Assistant Aeronautics & Astronautics

### INTEL | SYSTEMS/ COMPILER ENGINEER

- Aug 2019 - July 2021 | Software Engineer IOTG - Compiler Architecture
- Oct 2018 - Aug 2019 | Software Engineer IAGS - Systems Software
- May 2017 - Aug 2017 | Graduate Software Engineering Intern
- May 2016 - Aug 2016 | Graduate Software Engineering Intern

### PURDUE UNIVERSITY | GRADUATE STAFF

20 Hr Graduate Staff positions

- Aug 2024 - Dec 2025 | Lab Instructor Aerodynamics Wind Tunnel Labs
- Jan 2022 - May 2024 | Teaching Assistant Aerodynamics
- Aug 2021 - Dec 2022 | Teaching Assistant Mathematics Department
- Aug 2017 - May 2018 | Lab Instructor Computer Architecture Lab

## SELECT PROJECTS

### PRESENT - PURDUE | HIGH-ORDER CFD FRAMEWORK IN C++/KOKKOS

Developing hardware-agnostic implementations of explicit and compact finite difference schemes (E1-E6, DE, AC, C4, C6) for structured and curvilinear meshes, targeting multi-architecture scalability (CPU/GPU, OpenMP/CUDA/HIP). "Hardware-Agnostic Compact Difference Schemes in C++/Kokkos for High-Order CFD" AIAA SCITECH 2026.

### PRESENT - PURDUE | AEROSPACE SCIENCES LAB | SB LI AT MACH 2.0

Experimental investigations of swept oblique Shock-Wave/Boundary-Layer Interactions (SB LI) at Mach 2.0.

"Swept Oblique Shock/Boundary-Layer Interaction on a Sub-Boundary-Layer Bump" AIAA SCITECH 2025.

### PRESENT - PURDUE | PLASMA & ELECTRIC DISCHARGES COURSEBOOK

Co-authoring a comprehensive graduate-level textbook on Plasmas and Electric Discharges.

### 2019 - INTEL | PLAIDML EXECUTION PROVIDER FOR ONNX RUNTIME

Created the interface to enable ONNX Runtime with PlaidML as the execution provider, by extending the Tile eDSL to include ONNX operations.

### 2018 - INTEL | MOHAWK RIVER AMBIENT COMPUTE PROTOTYPE

Built a Face Recognition Module utilizing a 360 camera device for a dual-OS shared peripheral system. - Prototype showcased in COMPUTEX 2019.

### 2016 - INTEL | TELECONFERENCING & IROBOT OBSTACLE AVOIDANCE

A 360 teleconferencing application capable of handling a dynamic environment with automatic speaker detection & an iRobot device with obstacle avoidance capability were created using multiple Intel RealSense Cameras utilizing depth data and computer vision algorithms. - Prototype showcased at Intel DTTC 2017