



# ADITYA PHOPALE

M.Sc.(Hons.) Computational Science and Engineering at TUM

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## CAREER OBJECTIVE

I aim to merge data-driven modeling with traditional numerical approaches to better understand and predict complex fluid flow dynamics. Through the application of machine learning techniques, I seek to develop models that can accelerate simulations and enhance accuracy compared to current state-of-the-art methods.

## EDUCATION

**Technical University of Munich** *October 2021 - September 2024*

M.Sc. (Hons.), in Computational Science and Engineering,  
Bavarian Graduate School of Computational Engineering

Overall Grade: 1.5/1

Relevant courses: Scientific Computing, Numerical Programming, Parallel Programming, Lattice Boltzmann method, Turbulent Flow Simulation on HPC Systems, CFD Lab [Transcripts](#)

**Birla Institute of Technology and Science, Goa** *August 2017 - May 2021*

B.E. Mechanical Engineering  
Department of Mechanical Engineering

Overall Grade: 9.16/10

## EXPERIENCE

**Ansys** Jan 2025 - Present

*Chief Technology Office*

- Conducted research on foundational models for physics.
- Gained experience in Computer vision tools like Neural Radiance Field and foundation models for physics like POSEIDON

**Siemens Digital Industries Software** May 2023 - April 2024

*Working Student*

- Conducted research in scientific machine learning as part of my Master's thesis.
- Employed sampled neural networks with domain decomposition to solve partial differential equations.
- Improved understanding of domain decomposition techniques for SciML problems.

**Numeric Systems GmbH** Oct 2022 - April 2023

*Working Student*

- Executed benchmark CFD cases on Pacefish software.
- Validated results from the software with wind tunnel experiments.

## TECHNICAL SKILLS

**Programming Language** C++, Python, Julia, MATLAB

**DL frameworks** Pytorch

**Version Control** Git

**Parallel standards** OpenMP, MPI

**Analysis** Tecplot, Paraview

## HONOURS AND AWARDS

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### Bavarian Graduate School of Computational Engineering (BGCE)

Selected for the honours program of Masters in Computational Science and Engineering at the Technical University of Munich. (<https://www.bgce.de/>)

## THESIS

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1. A. K. Phopale. "Using neural networks with domain decomposition to solve partial differential equations." en. MA thesis. Technical University of Munich, May 2024.

## PROJECTS

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### Using neural networks with domain decomposition to solve partial differential equations (Masters Thesis @TUM & Siemens) [Thesis presentation](#)

- Implemented a method known as ELM to solve partial differential equations using a randomized neural network.
- Focused on improving solution accuracy in my thesis by employing better initialization techniques for neural networks, specifically utilizing the Sampling Where It Matters (SWIM) method and domain decomposition.
- Acquired valuable experience through collaboration on a research problem with industry.

### Domain decomposition to accelerate learning of Physics Informed Neural Network (PINN) (Seminar course @TUM) [Seminar paper](#)

- Replicated a paper implementing Finite Basis Physics-Informed Neural Network (FBPINN). [link](#)
- Implemented overlapping subdomains to solve partial differential equations using Physics-Informed Neural Networks.
- Computed the final solution through additive schwarz domain decomposition.

### Improve Building Efficiency for a Better Future (BGCE @TUM & Siemens) [Github](#)

- Collaborated with a team to develop an application to enhance building energy efficiency.
- Created a building's thermal model and heating control based on user-provided floor plans.
- Contributed to this project as part of the honors program at BGCE, supervised by Siemens.

### Simulating Free Surface Flows using Marker and Cell method (CFD Lab @TUM) [Github](#)

- Developed an object-oriented 2D parallel CFD solver in C++ for solving incompressible Navier-Stokes equations using Finite Difference Method (FDM).
- Extended the solver to support free surface flows utilizing the Marker and Cell Method, successfully simulating dam break and tank sloshing scenarios.

### Entropically Damped Artificial Compressibility using Compact finite-difference schemes (Undergraduate Thesis @BITS) [Thesis report](#)

- Utilized the EDAC technique to obtain solutions for the Navier-Stokes equation, bypassing the pressure Poisson equation by implementing a pressure-evolving equation.
- Extended the existing Fortran codebase for the Rayleigh-Bénard Convection Problem, adding new functionalities and improving performance.