

# ADHEESH TRIVEDI

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4<sup>TH</sup> YEAR, BS COMPUTER SCIENCE & ENGINEERING, IISER BHOPAL, INDIA

## EDUCATION

IISER Bhopal | GPA: 9.08\*/10 (3.63/4)

2022 – 2026

B.S. | Computer Science & Engineering

Bhopal, India

O (Outstanding): 10/10 • A: 10/10 • B+: 9/10 • B: 8/10

Multivariable Calculus (B+)

Discrete Mathematics (A)

Probability & Statistics (A)

Complex Variables (A)

Real Analysis (B+)

Applied Optimization (B+)

Introduction to C Programming (A)

Data Structures & Algorithms (B+)

Signals & Systems (A)

Theory of Computation (A)

Principles of Model Checking (A)

Fundamentals of Database Systems (O)

Machine Learning (B+)

Computer Vision (B)

Artificial Intelligence (B+)

Group Theory\*

Modern Cryptography\*

Information Theory & Coding\*

Computer Organization\*

## RESEARCH PROJECTS

On Robust Coloring of Graphs and ETH

July 2025 – Present

Mentor: Dr. Prafullkumar Tale

- Studing a relaxation of proper coloring in which edges with same color are associated with some cost.
- Studied the EXPONENTIAL TIME HYPOTHESIS, and ETH-Preserving reductions.
- Investigated treewidth; applied tree decompositions to dynamic programming on hard problems.

Scientific Tool for Bridging Model Checking Ecosystems

Dec 2024 – Present

Mentor: Dr. Arpit Sharma, PhD. Shonak Shaha

- The Model Checking ecosystem remains fragmented, with various tools and frameworks lacking seamless interoperability specifically between action based and state based model checking.
- Developing high-performance converters between action-labeled models ([CADP](#)) and ([mCRL2](#)) and state-labeled models ([PRISM](#)) / ([Storm](#)) to enable cross-ecosystem model checking.
- Emphasis on parser design, memory-efficient graph transformations, semantic preservation, and interoperability testing..

On the feasibility of parameterized algorithms for VC Dimensions

May 2025 – July 2025

Mentor: Dr. Prafullkumar Tale

- VC DIMENSION of a classification model is related to how complicated it can be, specifically in terms of the model's capacity to fit various datasets. Precisely, model's ability to generalize to unseen data.
- Tested efficient algorithms for computing the GRAPH VC DIMENSION.
- Assessed and compared the parameterized algorithms for GRAPH VC DIMENSION.

Reading Project on Graph Theory

Jan 2024 – Apr 2024

Mentor: Dr. Prafullkumar Tale

- Studied *A First Look at Graph Theory* (Clark & Holton) with problem solving.
- Reinforced concepts: Graphs & their types, connectivity, traversals, matching problem, planarity.

\*Ongoing

## TECHNICAL PROJECTS

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### Extensively Customizable Exam Scheduler (Graph Coloring)

Oct 2024 – Jan 2025

Vivek Kumar, Rahul Jana, Ayushman Shaha, Dr. Prafullkumar Tale

- Discovered that exam schedules for 14,000+ students and course registrations were being created manually, requiring significant effort.
- Developed an engine that assigns exams to time slots & halls minimizing same-day conflicts ( $\leq 24h$ ) using graph coloring + randomized optimization heuristics.
- Supports multi-hall allocation when enrollment exceeds single capacity; leverages NetworkX for constraint modeling.

### Texture Classification & Face Clustering for Image Search

Sep 2024 – Nov 2024

- The project aims to address the common challenge of navigating through directories containing a large collection of images, enabling users to efficiently filter and search for images.
- Pipeline: MTCNN detection  $\rightarrow$  InceptionResNetV1 embeddings  $\rightarrow$  cosine similarity for face grouping.
- Implemented batching to control GPU memory; evaluated multiple texture descriptors for retrieval precision.

### Bag-of-Words Chatbot (Context-Aware)

Oct 2021 – Dec 2021

- Built a context-aware chatbot supporting tasks like to-do lists, word definitions, note taking, and time queries across timezones.
- Trained a sequential neural network in TensorFlow on a custom dataset tailored to project requirements.

### General Purpose Discord Bot

Mar 2021

- Implemented modules for moderation, games, music playback, jokes & meme generation.
- The project was written in Python and utilized PostgreSQL database to store every configuration for the bot, which was server and user specific. The bot was designed to be scalable.

### GUI Developer Intern (Litesoph, AITG)

Feb 2024 – Aug 2024

Mentor: Prof. Varadharajan Srinivasan

- Led integration of scientific engines ([Octopus](#), [GPAW](#), [NWChem](#)) within a Python toolkit for photo-induced phenomena simulations.
- Automated submission workflows and job orchestration on national HPC clusters (PARAM-Ganga / PARAM-Kamrupa).

## LEADERSHIP & SERVICE

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### Coordinator – Coding Club

May 2024 – May 2025

IISER Bhopal

- The club aims to foster competitive programming skills and algorithmic thinking among students.
- It organizes onsite competitive programming contests; facilitates open discussions & tutorials.
- I actively mentor junior members and led workshops on advanced topics.

### Hackathon Organizer – Armacode 0

Jan 2024 – Apr 2024

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- Prepared questions for online round with over 500 applicants.
- Co-organized a 35-hour national hackathon; collaborated with faculty and industry experts on problem design and judging of 12 onsite teams.

## ADDITIONAL INTERESTS

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Music (Guitar) • Competitive Programming • Speed Typing • Mathematical Visualization (Desmos)

*This document is written using Typst*