

# 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+)	Principles of Model Checking (A)
Discrete Mathematics (A)	Fundamentals of Database Systems (O)
Probability & Statistics (A)	Machine Learning (B+)
Complex Variables (A)	Computer Vision (B)
Real Analysis (B+)	Artificial Intelligence (B+)
Applied Optimization (B+)	Group Theory*
Introduction to C Programming (A)	Modern Cryptography*
Data Structures & Algorithms (B+)	Information Theory & Coding*
Signals & Systems (A)	Computer Organization*
Theory of Computation (A)	

## RESEARCH PROJECTS

**On Robust Coloring of Graphs and ETH** *July 2025 – Present*

*Mentor: Dr. Prafullkumar Tale*

- Studying 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 algorithm with current state-of-the-art for GRAPH VC DIMENSION for real world networks.

**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.

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\*Ongoing

## TECHNICAL PROJECTS

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### Extensively Customizable Exam Scheduler using 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 → InceptionResNetV1 embeddings → cosine similarity for face grouping.
- Implemented batching to control GPU memory; evaluated multiple texture descriptors for retrieval precision.

### GUI Developer Intern

Feb 2024 – Aug 2024



Mentor: Prof. Vardharajan Srinivasan

AITG Labs



- 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).

### Context aware Bag-of-Words Chatbot

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.

## LEADERSHIP & ENGAGEMENT

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### Club Coordinator

May 2024 – May 2025

Coding club @ IISER Bhopal

### Hackathon Organizer – Armacode 0

Jan 2024 – Apr 2024

IISER Bhopal x IIIT Bhopal

## TALKS & TEACHING

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### Teaching Assistant - Theory of Computation

Aug 2025 – Dec 2025

Instructed by Dr. Arpit Sharma



### Fast Matrix Multiplication Algorithms

1 Sept 2023

Math Club @ IISER Bhopal

- Delivered a talk on Strassen's algorithm and its implications on computational complexity.

## ADDITIONAL INTERESTS

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