Adheesh Trivedi

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Indian Institute of Science Education and Research (IISER) Bhopal, India

Fourth-year CSE student who enjoys algorithms, graph theory, parameterized / exact methods, complexity, and model checking. I enjoy turning clean theoretical ideas it into clear, efficient code. I care about clarity, collaborative exploration, and implementations that mirror the elegance of the underlying mathematics. In addition to academics, I enjoy playing music instruments, practicing speed typing, and competitive programming.

Academic Interests

Algorithms • Graph Theory • Complexity Theory • Model Checking & Formal Verification • Parsing & Domain-Specific Languages • Low Level Programming • Machine Learning

Education

IISER Bhopal | *GPA: 9.08*/10 (3.63/4)* *2022 – 2026**
B.S. | *Computer Science & Engineering* *Bhopal, India*

Linear Algebra
Multivariable Calculus
Discrete Mathematics
Probability & Statistics
Complex Variables
Real Analysis
Applied Optimization
Introduction to C Programming
Data Structures & Algorithms
Signals & Systems
Theory of Computation
Principles of Model Checking
Fundamentals of Database Systems
Machine Learning
Computer Vision
Artificial Intelligence
Group Theory*
Cryptography*
Information Theory & Coding*
Computer Organization*

Research & Reading Projects

Series of Research Projects in Theoretical Computer Science *Jan 2025 – Present*
Mentor: Dr. Prafullkumar Tale

- Explored graph coloring & exam scheduling formulations; studied reductions related to P vs NP.
- Read about VC Dimension and its efficient algorithms.
- Investigated treewidth; applied tree decompositions to dynamic programming on hard problems.
- Studied Parameterized Complexity and the Exponential Time Hypothesis.
- Working on different sorts of graph coloring algorithms, such as Robust Coloring.

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.

Selected Projects

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*

- Pipeline: MTCNN detection → InceptionResNetV1 embeddings → 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 custom intent dataset; sequential NN (TensorFlow) with context retention across turns.
- Features: to-do lists, definitions, time-zone queries, note taking; PyQt5 interface.

General Purpose Discord Bot *Mar 2021*

- Implemented modules for moderation, games, music playback, jokes & meme generation.

Internships

Scientific Tool Developer Intern *Dec 2024 – Present*

Mentor: Dr. Arpit Sharma

- 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 using NuSMV.

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

Coordinator – Coding Club *May 2024 – May 2025*

IISER Bhopal

- Organized onsite competitive programming contests; facilitated open discussion & tutorial sessions.
- Promoted problem-solving culture; mentored peers in algorithmic thinking.

Hackathon Organizer – Armacode 0 *Jan 2024 – Apr 2024*

IISER Bhopal × IIIT Bhopal

- Co-organized a 35-hour national hackathon; collaborated with faculty and industry experts on problem design and judging.

Skills

Theory / Formal: Graph Theory, Model Checking, Parameterized Algorithms, Complexity Theory, Combinatorial Optimization

Algorithms & Tooling: Tree Decomposition, ILP Modeling, Reinforcement Learning, NetworkX, Graph Coloring, Parsers

Computer Languages: Python, C++, TypeScript, LaTeX

Additional Interests

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