



**Yogesh Kumar Patel**  
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Education	University	Institute	Year	CPI/%
Post Graduation	IIT Bombay	IIT Bombay	2023–25	8.69
Graduation	RGPV	UEC Ujjain	2019–2023	7.92

#### MTECH THESIS AND SEMINAR

- **Improving the Approximate Query Processing for cardinality of string queries** (May '24 - Present)  
(M.Tech Project | Guide: Prof. Suraj Shetiya)
  - Developing lightweight **Transformer** and **GAN-based** model to generate **database** rows and replicate string distributions, ensuring accurate and **scalable** string selectivity estimation for precise query cardinality
  - Enhance **query performance** for pattern matching (prefix, substring, suffix) in extensive datasets
  - **Optimize** the database query planning process by devising a solution that balances speed and accuracy, achieving cutting-edge results in **selectivity estimation**
- **Automated Reasoning: SAT/SMT Solvers** (Jan '24 - May '24)  
(M.Tech Seminar | Guide: Prof. Abhiram Ranade)
  - Implemented **automated reasoning** techniques, improving **program verification** and correctness
  - Implemented algorithms using **Z3 solver** to solve complex constraint satisfaction problems, including **N-Queens** and logical evaluations
  - Conducted literature survey on advanced **SAT/SMT solvers** by reviewing key research papers

#### PROJECTS

- **Multi-threaded Web Server** (Autumn 2023)  
(CS744: Design and Engineering of Computing Systems | Instructor: Prof. Varsha Apte)
  - Built a C++ **multithreaded** client-server app using **sockets** and **pthreads** for concurrent connections
  - Conducted closed-loop load testing to identify bottlenecks and improve server throughput and response time
  - Implemented request ID system for clients to retrieve grading results from the database, reducing **wait time** by 92% and decreasing **timeouts** by 85%
- **Daily Dive: A smart news aggregator website** (Autumn 2023)  
(CS699: Software Lab | Instructor: Prof. Bhaskaran Raman)
  - Developed dynamic **real-time** news aggregation app, seamlessly integrating content from 5 diverse sources
  - Built a **sentiment-based** news filter with real-time data fetching using **Django** management commands
  - Implemented comprehensive **CRUD** functionalities and integrated the application with **PostgreSQL**
- **Real-Time Anonymous Chat Application** (Spring 2024)
  - Built a real-time chat app with Tailwind CSS, Firebase, featuring **anonymous chat** rooms and live updates
  - Implemented Firebase Realtime Database for secure, seamless data synchronization and efficient chat functionality
  - Developed **secret phrase-protected chat rooms** to prioritize user privacy and ensure secure communication
- **Helmet detection and license plate recognition** (Autumn 2023)
  - Designed and developed a helmet detection system using Faster **R-CNN ResNet101** and **TensorFlow**
  - Implemented license plate recognition with **YOLOv8**, **OpenCV**, and **Google Vision API** for accurate detection
  - Integrated real-time video processing to combine helmet detection and license plate recognition for traffic management and law enforcement
- **Discrete event simulator for blockchain** (Autumn 2023)
  - Developed **discrete-event simulator** for a **P2P Blockchain network** from scratch using **python**
  - Employed varying miner **hashing powers** and **network delays** to assess effects on transaction processing
  - Emulated **selfish mining** and **stubborn mining** attack on top of the discrete event simulator

#### TECHNICAL SKILLS

- **Tools & Languages:** C, C++, Java, Python, HTML, CSS, JavaScript, Bash, Django, Postgres, SQL, Git,  $\text{\LaTeX}$
- **Technologies:** Microsoft SQL Server, PostgreSQL, Firebase, Pandas, Numpy, Matplotlib, Pytorch, Tensorflow

#### ACHIEVEMENTS & POSITIONS OF RESPONSIBILITY

- Achieved an **All India Rank 181** in GATE Computer Science amongst **75,680** candidates.
- Associate Placement Coordinator | Institute Placement Team
- Post Graduate Representative | Department of Computer Science and Engineering
- Management and Sponsorship Head | Xception 4.0