

# Krut Patel

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## EDUCATION

### University of Illinois Urbana-Champaign

Illinois, USA

M.S. Computer Science | GPA: 4.0

Aug 2023 – May 2025

**Thesis track:** Building novel Compilers for Heterogenous Architectures, advised by Prof. Charith Mendis

**Relevant Coursework:** Adv Compilers, Applied Parallel Prog, AI Efficiency: Systems & Algo, Adv Distrib Systems  
Teaching Assistant for CS 340 Intro to Systems Prog (Fall '24), CS 341 Systems Prog (Spring '24), CS 128 Intro to Prog with C++ (Fall '23)

### Birla Institute of Technology and Science (BITS) Pilani

Hyderabad, India

B.E. Computer Science | CGPA: 9.71/10 (in top 1%ile)

Aug 2017 – Jul 2021

## EXPERIENCE

### AWS Redshift

East Palo Alto, California

Software Dev Engineer Intern - Distributed Data and Transaction Management

May 2024 – Aug 2024

- Contributed to zero-ETL that delivers near real time streaming ingestion from other databases into Redshift
- Customer impact: can define arbitrary SQL transformations and point-in-time queries on streaming data
- Developed a new method of ingestion to directly expose the event log from source database
- Built an “Assist Mode” to enable lightweight data transforms such as data type remaps and column projections
- Gained deep knowledge of Postgres internals related to query execution cycle and data storage layouts

### Microsoft Research

Bengaluru, India

Research Fellow

Aug 2021 – Jul 2023

- Worked on a native query execution engine for Apache Spark using Just-In-Time code compilation
- Built a multi-stage compiler in Rust (using LLVM) with domain-specific optimizations for SQL
- Led the integration of the native query execution engine into the Azure Synapse suite to boost the performance of Spark jobs by up to 10× in multiple queries
- Developed runtime tooling, added Address Sanitizer support and hardware counter-based perf stats for profiling code and identifying system hotspots

### Microsoft Research

Remote

Research Intern

Aug 2020 – Jan 2021

- Joined the INSTalytics group led by Dr. Muthian Sivathanu, delivering performance improvements to SCOPE on Cosmos, the distributed big-data analytics platform powering Microsoft
- Enriched the Cascades-based query optimizer, making it aware of data partitions to produce more performant query plans
- Increased the number of hash join plans by determining when hash tables will fit in memory
- Led to a 5-6% reduction in overall query time, amounting to thousands of CPU hours saved per day

### Microsoft India (R&D)

Remote

Software Engineering Intern

May 2020 – Jul 2020

- Interned in the Microsoft Edge browser team to build a prototype for Natural Language History Search
- Customer impact: Enable users to search previously viewed pages with queries in plain English (“cake recipe from last week”)
- This has been rolled out for general availability now

## TECHNICAL SKILLS

**Proficient (>10k lines):** Rust, C++, Python, C, JavaScript    **Familiar:** CUDA, Go, Bash, Java, Scala, x86 ASM  
**Tools:** LLVM, TVM, PyTorch, GDB, Git, Docker, Nginx, Flask, Django, ReactJS

## ACHIEVEMENTS

### BITS Pilani Merit Scholarship

2017 - 2021 (All Semesters)

Conferred the Merit Scholarship for academic excellence, ranking in the top 1%ile of the batch every semester.

## EXTRACURRICULARS

### CRUx – The Programming and Computing Club

BITS Hyderabad

Secretary

Apr 2019 – Mar 2020

- Coordinated various club activities, hosted programming competitions and hackathons
- Organized the CRUx Capture the Flag 2019 Edition, and created problems covering JS Injection, Git secret token scans, and steganographic videos
- Spearheaded the Girls Mentorship Program, a bootcamp aimed at increasing diversity by providing access to structured learning and guidance for various fields in programming