Krut Patel

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EDUCATION

University of Illinois Urbana-Champaign   Illinois, USA
M.S. Computer Science   *Aug 2023 – May 2025*
Teaching Assistant for CS 341 Systems Prog (Spring '24), CS 128 Intro to Prog with C++ (Fall '23)
GPA: 4.0

Birla Institute of Technology and Science (BITS) Pilani   Hyderabad, India
B.E. Computer Science   *Aug 2017 – Jul 2021*
CGPA: 9.71/10 (in top 1%*ile*)

EXPERIENCE

Microsoft Research   Bengaluru, India
Research Fellow   *Aug 2021 – Jul 2023*

- Worked on accelerating Apache Spark using Just-In-Time code generation to execute SQL queries on native hardware
- 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 $10\times$ 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, building a prototype for the **Natural Language History Search** feature, which enables 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**: Go, Bash, Java, Scala, x86 ASM
Tools: GDB, Git, LLVM, Docker, Nginx, Flask, Django, ReactJS
Relevant Coursework: Adv Data Management, Adv Distrib Systems, Software Engineering

ACHIEVEMENTS

BITS Pilani Merit Scholarship   *2017 - 2021 (All Semesters)*

Conferred the Merit Scholarship for excellence in academic studies, 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