Sahil Jain

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PUBLICATIONS

- Counter-Example Guided Knowledge Compilation for Boolean Functional Synthesis   **CAV '23**

EXPERIENCE

Rubrik India
Software Engineer   *Jun '22 - Oct '24*

Technical Experience

- Designed & implemented **disk based recovery methods** for Hyper-V virtual machines, an **alternative** to existing recovery methods, enabling **secure and controlled digital forensic analysis and investigation**
- Developed **in-place recovery mechanism** for Hyper-V virtual machines by transferring only changed blocks and reducing data transfer to **5%** leading to **20x recovery speed improvements**
- Simplified Rubrik Backup Service dependency upgrades by automating the process, reducing manual work by 3 days per upgrade

Soft Skills

- Led **Hyper-V** transition to maintenance by on-boarding 3 new engineers, delivering additional training, addressing issues proactively & ensuring seamless handover – resulting in **a highly commended process**
- Recognized multiple times for **community contributions**, including mentoring junior engineers, facilitating knowledge transfer across sub-teams and improving developer productivity

Microsoft India
Software Development Intern   *May '21 - Jul '21*

- Implemented a feature to display relevant **Upsell campaigns for M365 & Xbox** on Microsoft account's order history page

PROJECTS

Counter-Example Guided Knowledge Compilation for Boolean Functional Synthesis   *Aug '21 - May '23*
Bachelor's Thesis Project

- Theorized and engineered a **counter-example guided algorithm** via **a novel representation** as **Skolem basis vectors** of given Boolean specification, enabling synthesis of **all possible Skolem functions**
- Resulting tool solves **308 out of 602 benchmarks** and is able to solve **22** benchmarks not solved by even **state-of-the-art tools**

Tapestry Pooling   *Sept '20 - Jul '21*
Research and Development Project

- Collaborated on developing **Tapestry**, a novel **non-adaptive** pooling strategy, enabling testing of COVID samples with **up-to 10x cost savings**
- Assisted in the incubation of a startup for **commercial deployment** and developed cloud architecture to enhance service accessibility.

Security Analysis of Random Number Generators   *Spring '21*

- Demonstrated seed recovery in **Mersenne Twister** from merely **3 consecutive outputs** using **Z3 SMT solver**

Spectre : Exploiting Speculative Execution   *Autumn '21*

- Demonstrated **Proof-of-Concept** for **Spectre** vulnerabilities via **timing-based side-channel attacks** to access arbitrary memory

Video Denoising using Low-Rank Matrix Completion   *Spring '20*

- Demonstrated denoising of multi-channel videos impacted by mixed noise using **Low-Rank Matrix Completion** formulation

EDUCATION

IIT Bombay   *2018 - 2022*
B.Tech. with Honors (Computer Science)
GPA: 9.68/10.00

ACHIEVEMENTS

- **All India Rank 2, JEE Advanced**   *2018*
- **All India Rank 40, JEE Mains**   *2018*
- **All India Rank 3, KVPY**   *2017*
- Recipient of **NTSE** Fellowship   *2016*
- **AP grade** in 2 courses, awarded to **Top 1%** students   *2019*
- **Team Gold & Individual Silver** medals in **NSUCRYPTO-2020**   *2020*
- **4th place** in India and **28th place** worldwide in **CSAW CTF**   *2021*
- **Gold Medal** in **Network Security Hackathon**, Inter-IIT Tech Meet   *2021*

SKILLS

Programming
Proficient : C++, Python, Scala, Golang
Familiar : Julia, Java, Rust, C#

Web Development
HTML, CSS, JavaScript, TypeScript, PHP

Frameworks & Libraries
ReactJS, NodeJS, Django, Angular, SQL, NumPy, Pandas, Matplotlib, Tensorflow, Scikit-learn

Cybersecurity Tools
Burp Suite, Ghidra, WireShark, GDB

DevOps & Tools
Docker, Jenkins, Git, Postman

Others
GraphQL, Z3, Android Studio, SMB

EXTRA CURRICULARS

- **Manager**, Cybersecurity Club & **Captain** of IIT Bombay's Capture The Flag Team   *2021-22*
- **Teaching Assistant**, CS 101   *2021*
- **Teaching Assistant**, PH 108   *2020*
- **Volunteer**, NSS   *2018-19*
- Participated in **XLR8 bot** & **RC Plane** competitions   *2018*

INTERESTS

- Cybersecurity & Systems Internals
- Maths
- Reading
- Languages & Phonetics
- Poetry