Varun Patil

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EDUCATION

University of California, Los Angeles   California, USA
Ph.D. Candidate, Computer Science (Advisor: Lixia Zhang)   *Dec. 2020 – 2025 (expected)*
M.S. Computer Science   *Sep. 2020 – Dec. 2021*

Indian Institute of Technology Bombay   Mumbai, India
B.Tech. Mechanical Engineering   *Jun. 2016 – Aug. 2020*
Institute Technical Roll of Honour

PROFESSIONAL EXPERIENCE

Meta Platforms, Inc.   Menlo Park, California
Software Engineering Intern (Rust/Erlang) – WhatsApp Server Privacy   *Jun. 2024 – Sep. 2024*
- Implemented crucial library infrastructure for Trusted Execution Enviuoronment (TEE) deployment at Meta
- Developed and deployed integrations for multiple new and existing large-scale services at WhatsApp

Operant Networks   Los Angeles, California
Software Developer Co-Op (C++) – Security   *Jun. 2023 – present*
- Implemented a cross-platform TPM-backed key storage solution for the Defined-Trust Transport (DeftT)
- Designed a new testing framework, internal tooling based on Conan, and 3× faster cross-platform CI/CD pipelines
- Designed a retrofit field device remote access platform with flexible ACL controls

LabN Consulting, L.L.C.   North Bethesda, Maryland
Software Engineering Intern (C/C++) – LCPS   *Jun. – Sep. 2022*
- Worked on porting a legacy implementation of the RSVP-TE protocol to the FRRouting software suite
- Ported the legacy code and tests to run on 64-bit hardware and implemented shims for integration with FRR

Computer Centre, IIT Bombay   Mumbai, India
Full-Stack Developer (TypeScript) – Single Sign On   *Sep. 2019 – Sep. 2020*
- Implemented an OAuth2/OIDC/SAML provider for authorization over LDAP-TOTP-FIDO authentication
- Implemented a very high performance geolocation provider (GeoIPNS) for suspicious activity detection
- Built popular open source plugins for migrating Nextcloud and Roundcube webmail to OpenID Connect
- Integrated authentication with SAML federated identity for Azure Active Directory and Google Workspace

Mercari, Inc.   Tokyo, Japan
Backend Software Engineering Intern (Go) – Product Catalog   *Jul. 2019*
- Developed a scalable backend for an internal data management tool for an arbitrarily large dataset
- Set up continuous integration and deployment over Kubernetes using CircleCI and Terraform

RESEARCH EXPERIENCE

UCLA   Los Angeles, California
Graduate Student Researcher – Internet Research Laboratory   *Apr. 2021 – present*
- Researching the Named Data Networking architecture with focus on distributed data synchronization protocols
- Authored the reference implementation of the State Vector Sync protocol in C++
- Implemented a network and security simulator-visualizer for running experiments in the browser

IIT Bombay   Mumbai, India
Undergraduate Student Researcher – Machine Learning Lab, Networked Systems Lab   *2018 – 2020*
- Built data pipelines and improved model architecture for grammatical error correction with deep learning
- Implemented and deployed an automated integration testing framework with Jenkins for a 5G packet core

Selected Publications

[1] **Patil**, Desai, Zhang, 2022. *Kua: A Distributed Object Store over Named Data Networking.* ACM ICN '22

[2] Moll, **Patil** et al. 2022. *The Evolution of Distributed Dataset Synchronization Solutions in NDN.* ACM ICN '22

[3] **Patil**, Song, Xiao, Zhang, 2022. *Scaling State Vector Sync.* ACM ICN '22

[4] Moll, **Patil**, Zhang, Pesavento, 2021. *Resilient Brokerless Publish-Subscribe Over NDN.* IEEE MILCOM '21

[5] **Patil**, Moll, Zhang, 2021. *Supporting Pub/Sub over NDN Sync.* ACM ICN '21

[6] Moll, **Patil**, Sabharwal, Zhang, 2021. *A Brief Introduction to State Vector Sync.* TR-NDN-0073

Software Projects

Memories | *PHP, Vue.js* | 2k+ GitHub stars   *2022 – 2024*
- Efficent and feature-rich photo management app for Nextcloud, supporting large media libraries
- First FOSS self-hosted photo manager to have all basic features of commerical alternatives

NDN-Play | *Angular, NDNts*   *2021 – 2023*
- Network simulator and visualizer for running a Named Data Network completely in the browser
- Features logic for packet routing and forwarding, topology manipulation and live traffic visualization
- Features a code editor with syntax completion; lets the user run real code on the simulated nodes
- Supports integration with Mininet, acting as a web interface to an emulated network topology

Imperials | *Golang, React*   *2021 – 2022*
- FOSS web alternative to the Settlers of Catan board game with beautiful graphics
- Features a rule-based AI supporting player interaction that can play all game modes

InstiApp | *Django, Angular, Android, Flutter*   *2018 – 2020*
- Open source university student activity platform for events, organizations, news, food, maps, etc.
- Implemented functionality for notifications, a search engine and hierarchical permissions and access control
- Advanced features include event advertisements to targeted groups, users interests, achievements etc.
- Led the original team of 10+ developers; the IIT Bombay deployment has 8000+ active users

Technical Skills

Advanced: JavaScript/TypeScript, Python, C/C++, PHP, Golang, Docker
Intermediate: C#, Ruby, Java, C, Lisp, Lua, Kubernetes