Varun Patil

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Education

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

Indian Institute of Technology Bombay — Mumbai, India
B.Tech. Mechanical Engineering — *Jun. 2016 – Aug. 2020*
Minor in Computer Science and Engineering, Institute Technical Roll of Honour

Experience

UCLA — Los Angeles, California
Graduate Student Researcher – Internet Research Laboratory — *Apr. 2021 – present*

- Conducting research on Named Data Networking with focus on distributed data synchronization protocols
  Selected Publications
  - **Patil**, Desai, Zhang, 2022. *Kua: A Distributed Object Store over Named Data Networking.* ACM ICN '22
  - Moll, **Patil** et al. 2022. *The Evolution of Distributed Dataset Synchronization Solutions in NDN.* ACM ICN '22
  - **Patil**, Song, Xiao, Zhang, 2022. *Scaling State Vector Sync.* ACM ICN '22
  - Moll, **Patil**, Zhang, Pesavento, 2021. *Resilient Brokerless Publish-Subscribe Over NDN.* IEEE MILCOM '21
  - **Patil**, Moll, Zhang, 2021. *Supporting Pub/Sub over NDN Sync.* ACM ICN '21
  - Moll, **Patil**, Sabharwal, Zhang, 2021. *A Brief Introduction to State Vector Sync.* TR-NDN-0073
- Authored the reference implementation of the State Vector Sync protocol
- Implemented a network and security simulator-visualizer (NDN-Play) for running experiments in the browser

LabN Consulting, L.L.C. — North Bethesda, Maryland
Software Engineering Intern – 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

IIT Bombay — Mumbai, India
Software Architect & Developer – Single Sign On, Computer Centre — *Sep. 2019 – Sep. 2020*

- Drafted a policy framework for enforcing multi-factor authentication on a diverse 10000+ organization
- 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
- Authored popular open source plugins for migrating Nextcloud and Roundcube webmail to OpenID Connect
- Conceptualized and developed Android and iOS clients for secure user-initiated passwordless authentication
- Integrated authentication with SAML federated identity for Azure Active Directory and Google Workspace

Institute System Administrator & Developers' Community Overall Coordinator — *Apr. 2019 – Jun. 2020*

- Led the community of software developers at the institute comprising of a 3-tier technical student team
- Administered the student datacenter hardware infrastructure and migrated from virtualization to LXC
- Developed a secure solution to digitize workflows in a decades-old system in emergency response to COVID-19

Undergraduate Researcher — *May – Jul. 2018*

- Worked on data processing and neural net architecture for correcting grammatical errors with deep learning

Mercari, Inc. — Tokyo, Japan
Backend Software Engineering Intern – Product Catalog — *Jul. 2019*

- Worked in an agile team to develop an industry-grade management tool for an arbitrarily large dataset
- Set up continuous integration and deployment over Kubernetes using CircleCI and Terraform

Software Projects

Memories | *PHP, Vue.js* *2022*

- 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

Imperials | *Golang, React* *2021 – 2022*

- Free (and ad-free) web alternative to the Settlers of Catan board game with beautiful graphics

InstiApp | *Django, Angular, Android, Flutter* *2018 – 2020*

- Open source university student activity platform for events, organizations, news, food, maps, etc.
- Basic functionality covers notifications, a search engine and hierarchical permissions and access control
- More advanced features include event advertisements to targeted groups, users interests, achievements etc.
- The project uses 8+ programming languages, supports all major platforms and has 100% backend test coverage
- I led the original team of 10+ developers, and the IIT Bombay deployment had 8000+ active users in 2020

MKXP Ports | *Ruby, C++, GLES, Java, WebAssembly* *2015 – 2019*

- Eight Windows games ported to Linux, macOS and Android using a popular open source engine
- Ported the GLES game engine to the web with Emscripten and adapted for asynchronous asset loading

Technical Skills

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