

# Varun Patil

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## EDUCATION

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### University of California, Los Angeles

*Ph.D. Candidate, Computer Science (Advisor: Lixia Zhang)*  
*M.S. Computer Science*

California, USA  
*Dec. 2020 – present*  
*Sep. 2020 – Dec. 2021*

### Indian Institute of Technology Bombay

*B.Tech. Mechanical Engineering*  
*Institute Technical Roll of Honour*

Mumbai, India  
*Jun. 2016 – Aug. 2020*

## SELECTED PUBLICATIONS

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- [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

## PROFESSIONAL EXPERIENCE

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### Operant Networks

*Software Developer Co-Op (C++) – Security*

Los Angeles, California  
*Jun. 2023 – present*

- Building a secure network for nuclear and solar energy infrastructure with the Defined-Trust Transport (DeftT)
- Implemented a cross-platform key storage solution with support for Trusted Platform Modules (TPMs)
- Built an improved testing framework for increased robustness and multiple internal developer tools

### LabN Consulting, L.L.C.

*Software Engineering Intern (C/C++) – LCPS*

North Bethesda, Maryland  
*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

*Full-Stack Developer (TypeScript) – Single Sign On*

Mumbai, India  
*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.

*Backend Software Engineering Intern (Go) – Product Catalog*

Tokyo, Japan  
*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

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### UCLA

*Graduate Student Researcher – Internet Research Laboratory*

Los Angeles, California  
*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

*Undergraduate Student Researcher – Machine Learning Lab, Networked Systems Lab*

Mumbai, India  
*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

## SOFTWARE PROJECTS

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### Memories | *PHP, Vue.js* | 2k+ GitHub stars

2022 – 2023

- Efficient and feature-rich photo management app for Nextcloud, supporting large media libraries
- First FOSS self-hosted photo manager to have all basic features of commercial 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

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**Advanced:** JavaScript/TypeScript, Python, C/C++, PHP, Golang, Docker

**Intermediate:** C#, Ruby, Java, C, Lisp, Lua, Kubernetes