

Ritwik (Ricky) Takkar

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- Areas of Interest** Blockchain; Formal Verification; Decentralized Sociotechnical Systems; Supply Chain Management; Security and Privacy for Internet of Things
- Education**
- Cornell University** 08/21-05/26
PhD, Systems Engineering
PhD Minor, Computer Science; PhD Minor, Electrical and Computer Engineering
Advisors: H. Oliver Gao, Kenneth P. Birman, and Hakim Weatherspoon
- Syracuse University** 08/17-05/21
BS, Computer Engineering
Advisor: Shiu-Kai Chin
- Publications** R. Takkar, K. P. Birman, and H. O. Gao. Towards Tomorrow's Supply Chains with Today's Technologies: Blockchain, Internet of Things, and Digital Twins. *Submitted, 2023*
- Teaching**
- ENMGT 5900/CEE 6910: Project Management** Cornell University
Graduate Teaching Assistant Spring 2022, Fall 2022, Fall 2023
Core graduate course in project management. Led grading staff of 7 graduate students, and assisted instructor in exam and assignments design. Spring 2022: 185 students; Fall 2022: 213 students; Fall 2023: 154 students.
- CS 4414: Systems Programming** Cornell University
Graduate Teaching Assistant (Awarded for Service) Spring 2023
Senior undergraduate elective course in programming applications with C++ on Linux. Led course grading among 4 TAs, taught biweekly recitations, and offered one on one assistance to students during weekly office hours. Spring 2023: 93 students.
- Academic Excellence Workshop (Precalculus, Calculus I)** Syracuse University
Instructor Fall 2019, Spring 2020, Spring 2021
Led a one-credit workshop for CS/engineering undergrads to enhance their proficiency in calculus through biweekly sessions. Average enrollment of 6 students per semester.
- Industry Experience**
- Schonfeld Strategic Advisors** New York, NY
Invitee, Schonfeld Early Engagement (SEE) Summit – PhD Track April 2023
Participated in an in-person interactive “datathon” leveraging real world assets to discover the application of academic skills in finance with portfolio managers/researchers.
- ParallelChain Lab** Hong Kong SAR
Software Engineer Intern Summer 2020, Summer 2021
- Built an asset tokenization platform, incorporating REST APIs and biometric authentication, using the Flutter SDK. Documented existing REST APIs detailing parameters, data types, authentication, status, and example curl commands through extensive testing.
 - Implemented a multi-biometric authentication flow consisting of facial, voice, and palm recognition during KYC on iOS with React Native.
- Open-Source Contributions**
- WordDefiner English Dictionary** Available on App Store + Play Store
<https://github.com/ritwiktakkar/WordDefiner> August 2022
The most challenging part of building this app was parsing the complex nested JSON structures consisting of maps and lists from the Free Dictionary API. Luckily, the Flutter SDK makes displaying entities within objects of the deserialized decoded JSON response in the UI quite simple with its ListView.builder widget.
- JCP-Stack** August 2021
<https://github.com/ritwiktakkar/JCP-Stack>
Designed a web scraper to selectively collect and store research paper results based on journal/conference title and date published from the ACM, Springer, and IEEE Xplore digital libraries. Written in Python using the Selenium WebDriver to automate browsing activity and BeautifulSoup to extract data from HTML.

ShortenMyURL

Available on App Store + Play Store

https://github.com/ritwiktakkar/shorten_my_URL

August 2020

Developed a lightweight URL-shortening app, incorporating the MVVM design pattern and using a third-party API to fetch the short URL, with the Flutter SDK. Integrated custom Google Apps Script to meticulously gather usage data, ensuring user anonymity while harnessing robust analytics to drive enhancements across successive app updates.

Projects**Impact of Earnings Calls on Next-Day Common Stock Opening Price**<https://rickytakkar.com/projects#earnings>

December 2021

Scraped 48,000 trading days' worth of data from Nasdaq, Yahoo Finance, Zacks, and Alpha Vantage and made heavy use of the Pandas package for data analysis. Partners and I approached this as a regression problem, then framed the question as a binary classification problem to predict the sign of the next day returns.

Programmable Delivery Vehicle<https://rickytakkar.com/projects#capstone-design>

Fall 2020, Spring 2021

Designed a programmable delivery remote-controlled vehicle with three other students for our Capstone Design Project (SU). Demonstrated items delivery between different indoor locations with programmable functionality over Wi-Fi using the SSH protocol. An array of sensors enabled real-time object detection for collision avoidance.

System-Theoretic Process Analysis (STPA) Tutorials

Advised by Professor Shiu-Kai Chin (Syracuse University)

Fall 2020

- Devised a set of tutorials and examples based on STPA: a novel hazard analysis approach based on the STAMP (Systems-Theoretic Accident Model and Processes) model developed by Prof. Nancy Leveson (MIT AeroAstro).
- Generated the substance of a new course offering senior undergraduate and new graduate students the ability to use STPA to analyze systems.

Skills

C#, Rust, Python (NumPy, Pandas, Matplotlib), C++, C, Git, Java, Dart (Flutter), Model-Based Systems Engineering (MBSE), PostgreSQL, SQL, Linux/Unix, LaTeX

Relevant Coursework

Cornell University

Program Synthesis, Runtime Verification, Big Messy Data, Cloud Computing, Adv. Systems, Model Based Sys. Eng.

Syracuse University

C# & Windows Programming, Computer Architecture, Database Management, Operating Systems, Object-Oriented Design, Systems Programming, VLSI Design

Awards/Honors

Graduate Teaching Assistant Award, CS Department, Cornell University

Spring 2023

Systems Engineering Departmental Fellowship, Cornell University

Fall 2021

magna cum laude, Syracuse University

May 2021

References

1. H. Oliver Gao
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2. Kenneth P. Birman
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3. Shiu-Kai Chin
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