

# Ritwik (Ricky) Takkar

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<b>Areas of Interest</b>	Decentralized Sociotechnical Systems; Complex Systems; Supply Chain Management; Internet of Things	
<b>Education</b>	<b>Cornell University</b>	Ithaca, NY
	PhD, Systems Engineering	<i>August 2021 - May 2026</i>
	PhD Minors in Computer Science and Electrical and Computer Engineering	
	Thesis committee: H. Oliver Gao, Kenneth P. Birman, and Hakim Weatherspoon	
	<b>Syracuse University</b>	Syracuse, NY
	BS, Computer Engineering	<i>August 2017 - May 2021</i>
	Advisor: Shiu-Kai Chin	
<b>Teaching</b>	<b>CS 4414: Systems Programming</b>	Cornell University
	<i>Graduate Teaching Assistant (awarded for service)</i>	<i>Spring 2023</i>
	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.	
	<b>ENMG 5900/CEE 6910: Project Management</b>	Cornell University
	<i>Graduate Teaching Assistant</i>	<i>Spring 2022, Fall 2022</i>
	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.	
	<b>Academic Excellence Workshop (Precalculus, Calculus I)</b>	Syracuse University
	<i>Instructor</i>	<i>Fall 2019, Spring 2020, Spring 2021</i>
	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.	
<b>Industry Experience</b>	<b>Schonfeld Strategic Advisors</b>	New York, NY
	<i>Invitee, Schonfeld Early Engagement (SEE) Summit – PhD Track</i>	<i>April 2023</i>
	Participated in an interactive “datathon” leveraging real world assets to discover the application of academic skills in finance with portfolio managers/researchers.	
	<b>ParallelChain Lab</b>	Hong Kong SAR
	<i>Software Engineer Intern</i>	<i>Summer 2020, Summer 2021</i>
	<ul style="list-style-type: none"><li>- 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.</li><li>- Implemented a multi-biometric authentication flow consisting of facial, voice, and palm recognition during KYC on iOS with React Native</li></ul>	
<b>Open-Source Contributions</b>	<b>WordDefiner English Dictionary (iOS + iPadOS app)</b>	
	<a href="https://github.com/ritwiktakkar/WordDefiner">https://github.com/ritwiktakkar/WordDefiner</a>	<i>August 2022</i>
	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**

<https://github.com/ritwiktakkar/JCP-Stack>

*August 2021*

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 (iOS + iPadOS app)**

[https://github.com/ritwiktakkar/shorten\\_my\\_URL](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.

## **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**

Rust, Python, C, C++, C#/.NET, Git, Java, Dart (Flutter), Model-Based Systems Engineering (MBSE), PostgreSQL, SQL, LaTeX

## **Relevant**

*Cornell University*

Runtime Verification, Big Messy Data, Cloud

## **Coursework**

Computing, Advanced Systems, Model Based Sys. Eng.

*Syracuse University*

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

## **Conference/**

### **Opportunities and Challenges for Digital Twins in Engineering**

## **Workshop**

*National Academies (Remote)*

*February 2023*

## **Attendance**

### **IAP Cornell Workshop on the Future of AI and Cloud Computing**

*Cornell University*

*October 2022*

**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 Howard Simpson Professor Department of Systems Engineering Cornell University hg55@cornell.edu	2. Kenneth P. Birman N. Rama Rao Professor Department of Computer Science Cornell University ken@cs.cornell.edu	3. Shiu-Kai Chin Professor Dept. of Electrical Eng. and Computer Science Syracuse University skchin@syr.edu
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