

EDUCATION

University of Illinois at Urbana-Champaign

PhD, Electrical and Computer Engineering

MS, Statistics; GPA: 4.0

MS, Electrical and Computer Engineering; GPA: 3.8

SRM Institute of Science and Technology

Bachelor of Technology in Telecommunications Engineering; GPA: 3.9

Massachusetts Institute of Technology

Visiting Student in Electrical Engineering and Computer Science

Urbana, IL

December 2021 (expected)

January 2021 – May 2021

August 2014 – December 2016

Chennai, India

August 2009 – August 2013

Cambridge, MA

August 2012 – June 2013

WORK & RESEARCH EXPERIENCE

University of Illinois at Urbana-Champaign

Research Assistant | network security, modeling & simulation, python, C++

Urbana, IL

August 2014 - Present

- Formalizing cybersecurity problems by applying graph-theoretic and optimization tools. Toward this end some projects include:
- **Melody**: a co-simulation tool for cyber-physical systems that generates datasets used for tuning machine learning models in data starved environments
- **Matador**: learning-driven, programmable network-based resiliency testing tool for data-center computing networks
- **StatIQ Defender**: a tool that assists the security architect choose among varied security monitors and optimally deploy them in the network
- **DynamIQ Defender**: improves on StatIQ by reducing security analyst intervention, and by making real time security-routing decisions for network traffic

IBM Research

Research Intern | python, tensorflow, pandas, numpy

Bangalore, India

May 2016 - Aug. 2016

- Built a prediction model that reduces error in solar energy production forecasting by over 50% compared to competing models
- Cleaned, trained, and validated the model on over 50 GB of data

Grainger

Research Intern | python, C++, scikit-learn

Chicago, IL

June 2015 - August 2015

- Worked on building a smart Internet of Things solution for the services and safety industries
- Applied learning based approaches to predict device failure horizons

Indian Institute of Technology

Research Associate | python, C#, scipy, scikit-learn

Mumbai, India

September 2013 - July 2014

- Spearheaded a team of 15 engineers on customizing Smart Grid solutions for the Indian market
- Developed learning algorithms that detect anomalous electric appliance behavior in buildings
- Invented a low cost occupancy identification system that tracks building occupants in real-time

Koumba Inc

Co-founder and Chief Technology Officer | Ruby on Rails, web development

Cambridge, MA

July 2013 - June 2014

- Designed Koumba, a website that aims to match prospective roommates to make community living more fun
- Developed algorithms for constrained graph matching and roommate recommendation

MIT Media Lab

Undergraduate Researcher | Java

Cambridge, MA

September 2012 - December 2012

- Identified pitfalls of current distributed systems in low-latency high-mobility environments
- Built an Android-based peer-to-peer data sharing system to address the pitfalls

Alcatel Lucent

Software Engineering Intern

Bangalore, India

November 2011 - December 2011

- Diagnosed the drawbacks of insufficient bandwidth for 3G mobile devices
- Assisted in assembling a Wi-Fi offload solution for the same

TEACHING & LEADERSHIP EXPERIENCE

UIUC Department of Electrical and Computer Engineering	Urbana, IL
Instructor / Teaching Assistant	August - December 2018 / 2017
<ul style="list-style-type: none">◦ Led instruction of the graduate course (ECE/CS 541: Computer Systems Analysis) on applying stochastic processes, queueing theory and simulation to study the performance and reliability of computing systems◦ Designed labs, exams and project statements to enable better understanding of course material◦ Listed on Teachers Ranked Excellent by the university based on student feedback	
UIUC Engineering Graduate Student Advisory Committee	Urbana, IL
Committee Member	August 2019 - Present
IIT Smart Energy Hackathon	Mumbai, India
Organizer	January 2014
MIT Living Group Council	Boston, MA
House President	January 2013 - May 2013
Indian Science Congress	Chennai, India
Lead Student Organizer	January 2011
SRM Joy of Giving Week	Chennai, India
Chief Organizer	October 2010

HONORS & AWARDS

- **EPRI Research Award, Aug 2019:** A \$75,000 research grant by the Electric Power Research Institute
- **RSA Security Scholar, Aug 2018:** Awarded for 3 years by RSA Security (Dell Technologies)
- **IJCAI Travel Award, Jan 2017:** Awarded by the International Joint Conference on Artificial Intelligence
- **Siebel Energy Institute award, Aug 2016:** A \$50,000 research grant awarded for a year of research
- **Founders' Scholar, Aug 2009-2013:** Awarded for continued academic excellence by SRM University
- **Dean's List, Aug 2012, 2013:** Awarded for academic performance in the junior and senior years by SRM

SKILLS

Languages: Python, R, C++, SQL, Ruby, HTML, CSS, TensorFlow, Matlab

Modeling and Analysis: Deep Learning (CNN, RNN, GAN), Machine Learning, Applied Probability, Stochastic Processes, Queuing Theory, Graph Theory, Discrete Optimization

Network Security: Risk Analysis and Mitigation, WireShark, Intrusion Detection Systems (Bro, Snort)

SELECTED PUBLICATIONS

"Hardening Critical Infrastructure Networks Against Attacker Reconnaissance" 2020 QEST . 2019.

"Optimal Monitoring Strategies for Critical Infrastructure Networks." 2019 Sigmetrics . ACM, 2019.

"Melody: synthesized datasets for evaluating intrusion detection systems for the smart grid." Winter Simulation Conference (WSC). IEEE, 2017.

"Blue Skies: A Methodology for Data-Driven Clear Sky Modelling." IJCAI. 2017.

"An approach to incorporating uncertainty in network security analysis." Hot Topics in Science of Security: Symposium and Bootcamp. 2017.

"Invisible and forgotten: Zero-day blooms in the IoT." PerCom. IEEE, 2016.

Rest of the publications (13 total, 7 first author) can be found on kartikpalani.com