XINLONG YIN

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EDUCATION

University of Michigan, EECS (Transferred form SJTU after 2nd year)   *August 2019 - Present*
B.S.E. in Computer Engineering

Selected Coursework and Grades: Computer Networks (A+), Database Management Systems (A+), Operating Systems (A-), Machine Learning (A), Data Structures and Algorithms (A+), Computer Organization (A+), Linear Algebra (A), Java Programming (A), Critical Reasoning (A), Multidisciplinary Design Program (A), **Midwest I-Corps Node** Entrepreneurship Course
Cumulative GPA: **3.96/4.0**

Shanghai Jiao Tong University (SJTU)   *September 2017 - August 2019*
B.S. in Electrical and Computer Engineering

Selected Coursework and Grades: Probabilistic Methods in Engineering (A+), Introduction to Programming (A), Programming and Data Structures (A), Introduction to Logic Design (A)
Cumulative GPA: **3.54/4.0**

RESEARCH INTERESTS

Research Area: Computer Networks and Distributed Information Systems
Problem Interests: Machine Learning in Cloud Systems, Cyber-Security and Privacy Analytics,
Experience with Research Methodologies: AI, ML, Deep Learning, Statistics, Graph Theory, Stochastic Processes
Faculty Mentors (and Research References): Ranjan Pal, Mingyan Liu, Kang G. Shin

UNDERGRADUATE RESEARCH EXPERIENCE

Aggregate Cyber-Risk Management (In)Feasibility in IoT Societies   January 2020 - July 2020

I am interested in the following problem: *assume a network of organizations depending upon one another for maintaining QoS, each of which is a potential source of a cyber-risk distribution in the event of a cyber-attack and buys coverage-based risk management solutions (e.g., insurance) from commercial third-parties, is it possible for such solution providing entities to profitably manage the aggregate loss impact together in the event of major cyber-attacks?.* In collaboration with Ranjan, Mingyan, and another undergraduate student, **I answered the question for cyber-risk distributions that are i.i.d. and are statistically heavy-tailed** - the latter reflecting catastrophic cyber-risks that might be the trend in the future IoT age. *I advanced the state of the art by proving in theory (and validating via data sets) that for i.i.d. catastrophic cyber-risks, it is not profitable for commercial loss-coverage agencies to accumulate cyber-risks from multiple networked sources.* My task involved analyzing the variation of the popular Value-at-Risk (VaR) cyber-risk metric under the accumulation effect of a family of heavy-tailed cyber-risks. The outcome of my research led to **accepted** publications in (a) the premier *IEEE/INFORMS Winter Simulation Conference*, 2020 (paper #1), (b) the top top-tier IoT journal: the *IEEE IoT Journal* (paper #2), and a **'minor revision'** decision in the premier MIS journal: *ACM Transactions of Management Information Systems (TMIS)* (paper #3).
Faculty Mentors - Ranjan Pal, Mingyan Liu

'De-Mystifying' Datasets for Social Good Applications (Ongoing SURE Research) May 2020 - Present

Certain classes of business/cyber-security applications for the social good require the knowledge of individual consumer/traffic object labels, for improved performance - both socially and commercially. *However, due to privacy/quality constraints, market data available for such applications is at best aggregated over consumers/traffic objects.* **I devised a deep learning model with *TensorFlow* that uses knowledge of aggregate labels in a data set and pre-known preference/traffic object distributions to predict individual object labels.** I used the power of Generative Adversarial Networks (GAN) to achieve around 30% improvement in object labeling accuracy compared to other state-of-the-art methods that predict object labels from their distributions.
Faculty Mentors - Ranjan Pal, Mingyan Liu

SOFTWARE EXPERIENCE, GRE/TOEFL SCORES

– Python, C++, C, HTML, CSS, Java, Javascript, SQLite, MySQL, MATLAB, Verilog, ARMv8, LC2K, LaTeX, C#
– GRE (330/340, Verbal: 160, Quant: 170, Writing: 4.0), TOEFL (103/120)

SELECTED CODING EXPERIENCE IN A PROGRAMMING PROJECT AT MICHIGAN

Testing Performance of Machine Learning Model Inference Systems   May 2020 - August 2020

I was responsible for designing test cases in Python to enable the design of resource-efficient (under worst-case compute-bandwidth resource requirements) SLA-maintaining machine learning model inference systems to be run on heterogeneous CPU and GPU clusters. I first built supervised machine learning model pipelines in Python that included models on speech translation, video summary, and image captioning using *TensorFlow* and *PyTorch*. I then designed test cases in Python covering the input, output space, and resource consumption space of the individual models in the pipelines that can stress test the efficiency of the system under bottlenecks.

Coding and Faculty Mentor - Kang G. Shin

COMMERCIAL PROJECT EXPERIENCE

Principal Financial Group, Inc.   January 2020 – December 2020
Multidisciplinary Design Program Member

I participated in building a website for Principal to provide better service for microbusiness owners. After user interviews, we knew that their need is to have a one-stop information platform of benefit packages where they can talk to who they trust. Therefore, we built a website consisting of a homepage that introduces different benefits, a calculator that can recommend benefit packages and calculate the price of them based on users' inputs, and a forum for microbusiness owners to share opinions. We built the website using React, Flask, MySQL, and deployed it on the Google Cloud Platform.

Faculty Mentor - James Juett, ***Sponsor Mentor*** - Tony Tavegia

ACTIVITIES & LEADERSHIP

Vice Minister of Career Department of the Student Union   July 2018 –July 2019
Shanghai Jiao Tong University

I was in charge of connecting SJTU alumni to act as *one-on-one* consultants (e.g. revising essays, planning career paths) to SJTU students on their career development. I contacted 50 alumni, collected their expertise information, and opened a common account platform on *WeChat*, where these experts and students could interact on career development. My efforts **improved the participation rate of students by 10 fold, compared to previous one-many WeChat accounts that were used at SJTU.**

PROFESSIONAL MEMBERSHIPS

Student Member of the IEEE and the ACM

PUBLICATIONS (CLICK TO SEE)

R. Pal, Z. Huang, **X. Yin**, M. Liu, S. Lototsky, J. Crowcroft: Sustainable Catastrophic Cyber-risk Management in IoT Societies, ***Accepted*** *To Appear in IEEE/INFORMS Winter Simulation Conference (WSC)*, 2020

R. Pal, Z. Huang, **X. Yin**, M. Liu, J. Crowcroft, S. Lototsky, S. Tarkoma, S. De, N. Sastry: Aggregate Cyber-Risk Management in the IoT Age, ***Accepted*** *To Appear in the IEEE Internet of Things Journal*, 2021

R. Pal, Z. Huang, S. Lototsky, **X. Yin**, M. Liu, J. Crowcroft, S. De, N. Sastry, B. Nag: Will Catastrophic Cyber-Risk Aggregation Thrive in the IoT Age?: An Economic Take on Managing Aggregate Heavy-Tailed Risks, *Received a **Minor Revision** Decision from the ACM Transactions on Management Information Systems* [Presented at the INFORMS Annual Meeting, 2020]

SELECTED HONORS AND AWARDS

1. My research "The feasibility of cyber-risk management to ensure social good" was covered by *Forbes Magazine.*
2. Received the prestigious 2020 Summer Undergraduate Research (SURE) award from the University of Michigan.
3. I was on the Dean's List and University Honors at University of Michigan in 2020.