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Junhui Li

EDUCATION

University of Michigan **Ann Arbor, MI**
Degree: B.S.E. in Computer Science *Sept 2019 - May 2021(Expected)*
GPA: 3.71/4.00
Honors: Multidisciplinary Design Program Summer Fellowship, Dean's List, University Honors
Core Coursework: *Machine Learning, Data Structure & Algorithms, Advanced Operating System, Computer Vision, Computer Organization, Linear Algebra, Fundamentals of Computer Science, Java*

Univ of Michigan - Shanghai Jiao Tong Univ Joint Institute **Shanghai, China**
Degree: B.S.E. in Electrical and Computer Engineering *Sept 2017 - Aug 2021(Expected)*
GPA: 3.55/4.00 Major GPA: 3.60/4.00
Core Coursework: *Programming & Elem Data Structures, Discrete Mathematics, Logic Design, Calculus, Computers & Programming, Probabilistic Methods in Engineering*

PUBLICATIONS (INDICATES EQUAL CONTRIBUTION)*

S2-CAN: Sufficiently Secure Controller Area Network
Mert D. Pesé, Jay W. Schauer, **Junhui Li**, Kang G. Shin.
In submission to IEEE Symposium on Security and Privacy, IEEE S&P 2021 [PDF]

Social Data Trading is Privacy Welfare Damaging
Ranjan Pal*, Yixuan Wang, **Junhui Li***, Mingyan Liu, Jon Crowcroft, Yong Li, Sasu Tarkoma.
In submission to IEEE Transactions on Network and Service Management, TNSM 2021 [PDF]

The Role of Monetary Incentives In Human Privacy Preference: Insights from Global RCT Experiments on Mobile App Users
Ranjan Pal*, Yixuan Wang*, **Junhui Li***, Mingyan Liu
The Institute for Operations Research and the Management Sciences, INFORMS 2020 [Video]

Data Trading With a Monopoly Social Network Outcomes are Mostly Privacy Welfare Damaging
Ranjan Pal*, **Junhui Li***, Yixuan Wang, Mingyan Liu, Swades De, Jon Crowcroft.
IEEE Networking Letters 2020 [Webpage]

RESEARCH EXPERIENCE

Real-Time Computing Laboratory at **University of Michigan**

Research Assistant, Advisor: Prof. Kang G. Shin *Apr 2020 - Present*

S2-CAN: Sufficiently Secure Controller Area Network *Apr 2020 - Jun 2020*

This research developed a sufficiently secure alternative CAN(S2-CAN) with minimal overhead on resources and latency by leveraging protocol-specific properties of CAN.

- Implemented the handshake pattern among central gateway and ECUs to exchange security parameters and ensure using S2-CAN syntax with neglectable latency.
- Realized encode and decode methods without cryptography to reduce resource overhead and latency.
- Modeled the vehicular central gateway architecture with three Arduinos; proved its zero resource overhead and lowest end-to-end latency.
- Contributed to a third-author paper in submission to IEEE S&P 2021.

MichiCAN-DoS Counter Attack by MAC Layer Bypass *Sept 2020 - Present*

This research proposes a novel anti-spoofing defense system with microcontrollers against compromised electronic control units(ECUs), which manages to avoid flooding the bus with lower network latency.

- Design the defense system to detect and force malicious ECUs into the bus-off state without actively creating message collisions. Implement a communication pattern between ECU and microcontroller.
- Utilize the logic analyzer to observe how microcontroller and attacker's messages transmit. Re-implement exiting solution Parrot to evaluate this approach.
- Contributing to a first-author paper intended for submission to AutoSec 2021.

Network, Communication & Information Systems Group at **University of Michigan**

Research Assistant, Advisors: Prof. Mingyan Liu and Ranjan Pal *Dec 2019 - Present*

Privacy Trading Ecosystems in the Era of Information Surveillance *Dec 2019 - May 2020*

This project investigated the impact of monetary incentives on human preference for digital privacy trade.

- Utilized machine learning and Bayesian statistics methods to research the dependence of the surveyed 300,000 mobile apps users' social backgrounds and willingness to trade privacy.
- Constructed a Bayesian network to study how financial incentives impact the extent to which users are willing to trade privacy; analyzed the underlying social patterns that characterize the preferences.
- Contributed to a first-author paper submitted to TNSM 2021, as well as one paper accepted by IEEE Networking Letters 2020 and one presentation made on INFORMS 2020.

INTERNSHIPS

ProQuest Co., Ltd. Ann Arbor, MI

Research Intern, Advisor: Prof. Brian Noble *Jan 2020 - Present*

Project: AI Powered Smart Search System

This Program optimizes ProQuest's search engine Dialog by proposing a method to assign cooperative patent classification(CPC) code to unify patent schemes and better categorize document in the database.

- Compared existing solutions to the CPC classification model; proposed a hierarchical structure of Deep-Learning model that can capture class distribution characteristics to predict single CPC code.
- Trained Deep Learning model DistilBert for section-level and class-level CPC code with optimal reweighting and resampling techniques; achieved 80% accuracy.
- Analyzed coverage error of multi-label DL model RoBERTa; identified hyperparameters to address the Extreme Multi-Label Text Classification problem.
- Obtained the MDP Summer Fellowship; the optimized system would be adopted after product delivery.

NetEase Inc. Hangzhou, China

Android Engineer, Cloud Music Dept. *Jun 2020 - Aug 2020*

Project: Revolutionary NetEase Cloud Music Update 8.0

This project improved the user experience and backstage operation for the most popular music app in China.

- Self-learned Kotlin and published detailed study notes to company technical documentation system.
- Added new Lottie animation to UI interface and beautified VIP profile card display; developed new functionalities such as "Follow Anchorman" feature for the radio station in Cloud Music App.
- Tested and debugged code for robustness; analyzed edge case, usability, and general reliability.

EXTRACURRICULAR & LEADERSHIP

Minister, **Brave on Diversity Women Engineers' Club** *Feb 2018 - Aug 2019*

- Jointly proposed the core mission of the club: to voluntarily help women promote their technical proficiency as engineers and leaders by designing high-quality workshops.
- Led a team of 12 to reach professors and alumni to deliver workshops for about 30 female participants.

Vice President, **SJTU-UM Student & Alumni Association** *Dec 2019 – Present*

Volunteer Reviewer, **WCX SAE World Congress Experience** 2021 *Nov 2020 - Present*

Grader, **Linear Algebra/ Advanced Linear Algebra/ Machine Learning** *Jan 2020 - Present*

SKILLS

Programming: C/C++, Python, Arduino, Java, Kotlin, MATLAB, ARMv8
Framework: Pytorch, Keras, Tensorflow
English: GRE: 332 (Verbal: 162, Quant: 170, AW: 4.5), TOFEL: 112 (Speaking:26)