

# YU WANG

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## EDUCATION

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- Ph.D. in ECSE Electrical Engineering** Sep. 2017 - May. 2022 (Expected)  
Rensselaer Polytechnic Institute GPA: 4.0/4.0  
Research Interests: Machine Learning, Networking, Security and Privacy, IoT
- M.S. in ECE Signal Processing and Machine Learning** Sep. 2015 - Apr. 2017  
University of Michigan - Ann Arbor GPA: 3.86/4.0  
Research Interests: Machine Learning, IoT, Computer Vision
- B.S. in Communication Engineering** Sep. 2011 - Jul. 2015  
China University of Petroleum(East China), GPA: 91.39/100

## SKILLS

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Machine Learning, Deep Learning, Python, C#, Unity, Matlab, SQL, Data Structure, Linux, Cryptography, Operating System

## SELECTED RESEARCH & PROJECTS

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- Network Protocol Design for multi-player VR Applications** May. 2020 - present
- The affiliated VoRTeX project aims at using a multi-player VR simulation environment to evaluate the communication skills among a surgical team.
  - My designed network model provides low latency and high reliability for V.R. applications compared to traditional TCP and UDP protocols.
  - A novel reinforcement learning-based network protocol (RCP) that outperforms TCP/UDP/ARQ is proposed and evaluated to provide a combination of delivery and latency guarantee for any customized utility functions.
- Privacy and Anonymity Issues In Caching Network** Sep. 2017 - May. 2020
- We observed a privacy leakage issue in the Coded Caching network in the presence of eavesdroppers and colluding users. A feasible attack algorithm later verifies such observation.
  - A makeup solution that analyzes the Anonymity-Memory-Rate trade-offs is later proposed. The solution achieves an arbitrary privacy level by trading either memory or transmission rate.
- Labs Design for ECSE 4660/6660 Internetworking of Things** Jan. 2018 - present
- My work contributes significantly to the initiation of the IoT course in the RPI ECSE department.
  - I design and maintain student labs covering topics from micro-processor, sensor network, cryptography, and upper-level applications such as indoor localization.
  - Received Dr. Alireza Seyedi '99, '04 Teaching Assistant Award at Rensselaer in 2020.
- Human Pose Recognition** Nov. 2018 - Dec. 2018
- I implemented a CNN + LSTM model using Tensorflow to recognize the person's action in video slices.
  - The implemented simple model achieves a prediction accuracy of over 98.68% with data acquired from YouTube.
- Back-Channel for ULP devices via WiFi Transmitter** Jun. 2016 - May. 2017
- I engaged in the "Back-Channel" project that enables OFDM transmitters (WiFi) to control devices accepting only ASK/FSK.
  - I proposed a "Patching Algorithm" that allows the OFDM transmitter to accept almost all block encoders.
- Gnuradio Based CDMA Communication System** Nov. 2015 - Sep. 2016
- I contributed to an open-source implementation of the CDMA system in Gnuradio and helped speed up the matched filter's efficiency by using FFT.

- Theoretical analysis and verifications, multiple system-wise optimizations were conducted to provide performance guarantees and improve the overall running efficiency.

### **Prediction of Name's Popularity**

Mar. 2016 - Apr. 2016

- An epidemic model was proposed to predict the trend of using a new name.
- My model was verified to achieve over 95% accuracy over the dataset provided by USA Social Security Administration with over 30000 names over a century.

### **Indoor Navigation Application**

May. 2012 - May. 2014

- Explore the possibility of using WiFi signals to do indoor localization
- Evaluate the fingerprint algorithm on the Android platform
- The idea of "Backward Navigation" that allows users to find their way back in a complex indoor environment is proposed

### **An Improved Directional Broadcast Algorithm based on Brownian motion**

Jul. 2013 - Jul. 2014

- I contributed to the derivation and simplification of the experimental expression in the main conclusion.
- I proposed the idea of Bonus-Malus to resolve the parameter tuning and estimation problem in protocol design.

## **INTERNSHIP EXPERIENCE**

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### **GRC Research Intern**

May. 2019 - Aug. 2019

*General Electric Research*

- Contribute to the development, implementation, and evaluation of the Time-Sensitive Network (TSN) on dedicated hardware for various time-sensitive industry applications
- Generalize the TSN deployment process to support existing data distribution systems (802.1cb), optimize and visualize the scheduling process (802.1qbv, qcc, as), and evaluate the hardware limits on timing
- Explore the possibility of integrating a novel cryptography system

### **Development Engineer**

Nov. 2014 - Feb. 2015

*Nanjing Weihuang Electronic Ltd.*

- Design an industry-level large-scale LCD screen from PCB design to the final product.
- Learn many hands-on skills such as soldering and PCB design. These skills later helped to design more sophisticated labs for the IoT course in RPI.

## **PUBLICATION & PATENT**

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Wang Y, Abouzeid A, A Privacy Attack on Coded Caching by Colluding Users[J]. IEEE Communications Letters, 2021

Wang Y, Abouzeid A, A Reinforcement Learning-Based Retransmission Control Protocol for Delivery and Latency Sensitive Applications[C] 2021 The 30th International Conference on Computer Communications and Networks (ICCCN 2021)

Wang Y, Abouzeid A, On the Privacy Leakage of Coded Caching[C] 2020 IEEE International Conference on Communications (ICC 2020)

Dai Y, Peng W, Wang Y, et al. Implementation and Evaluation of Bi-Directional WiFi Back-channel Communication[C] 2018 IEEE 29th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC).

Li S, Lou L, Wang Y, et al. An improved directional broadcast algorithm based on Brownian motion[J]. International Journal of Distributed Sensor Networks, 2014, 2014.

Wang Y, Integrated Navigation System for Indoor & Outdoor and Educational Information Software Copyright (No:2014SR106525) 2014