# RUICHEN JIANG

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## EDUCATION

**Tsinghua University** — Beijing, China
*B.Eng. in Electronic Engineering (First Major)* — Aug 2016 - Jun 2020 (Expected)

- GPA: 3.86/4.0; Rank: 10/266
- Received the Academic Excellence Award (2017 - 19)

**Tsinghua University** — Beijing, China
*B.Eng. in Pure and Applied Mathematics (Second Major)* — Sept 2017 - Jun 2020 (Expected)

- GPA: 3.81/4.0

**University of New South Wales** — Sydney, Australia
*Exchange Student* — July 2018 - Nov 2018

- WAM: 94.25/100
- Achieved second place (joint) in the 2nd Simon Marais Mathematics Competition

## RESEARCH EXPERIENCE

**The University of Hong Kong (Department of Electrical and Electronic Engineering)**
Pokfulam, Hong Kong
*Research Assistant to Dr. Kaibin Huang,* — July 2019 - Sept 2019
**Cooperative Diversity in Over-the-Air Computation**

- *Over-the-air computation* (AirComp) is a promising solution for ultra-fast aggregation in wireless network where many devices transmit their message simultaneously. However, channel fading can severely impair its performance.
- We incorporate cooperative diversity techniques into AirComp, investigating the power control at source nodes and relay schemes at relay nodes respectively.
- Future work focuses on in-depth analysis of the outage behaviors using random matrix theory.

**Tsinghua University (Department of Electronic Engineering)** — Beijing, China
*Research Assistant to Prof. Sheng Zhou and Prof. Zhisheng Niu,* — March 2019 - Present
**Reliable Communication in mmWave Vehicular Network Using Deep Learning**

- Machine learning is a promising solution for mmWave wireless systems in vehicular network. Previous work has shown its potential in blockage prediction and beam selection problems.
- In this project, we extend prior work by combining the channel information and situational awareness efficiently, and investigate reliable communication with the presence of dynamic blockages.
- Currently, we have configured Wireless Insite, a ray-tracing simulator, together with SUMO, a traffic simulator, to generate training and testing dataset.

**University of New South Wales (School of Electrical Engineering)** — Sydney, Australia
*Research Assistant to Prof.Jinhong Yuan,* — July 2018 - Nov 2018
**Soft Decoding of BCH Codes**

- Traditionally, BCH codes are decoded with hard-decision decoding algorithms like Berlekamp-Massey algorithm. These hard-decision decoders fail to exploit soft information available, limiting their error performance.

- We explore a recently proposed coding scheme that performs iterative soft decoding of binary BCH codes, where a collection of codewords are transformed into a non-binary LDPC codeword. We reproduce the simulation results, and give some interpretations from the perspective of minimum distance.

**Tsinghua University (Department of Electronic Engineering)** Beijing, China
*Student Research Training Project with Prof.Fei Qiao,* Dec 2017 - Jun 2018
*Integrated Vision and Intelligent Perception Lab*
**Dynamic Vision Sensor**

- Collected the event-based data from the dynamic vision sensor
- Studied how spiking neural network (SNN) can be utilized to process the asynchronous data

## SELECTED AWARDS AND HONORS

- Joint 2nd place in the 2nd Simon Marais Mathematics Competition, 2018 (among 355 participants)
- The China Scholarship Council (CSC) Scholarship, 2018
- Tsinghua Academic Excellence Award, 2017-19 (Top 5% of 266 students)
- 1st Prize for the 34th National Undergraduate Physics Olympic, 2017
- 3rd Prize for 19th Tsinghua Electronic Design Competition, 2017 (top 8 of 70 teams)

## ADDITIONAL INFORMATION

- **Computer skills:** C/C++, MATLAB, Mathematica, Python, Linux, LaTeX
- **Language skills and proficiency:** Chinese (Native); English (TOEFL: 107, GRE: 170+156 )
- **Extracurricular activities:** Drop-in Tutoring for STEM courses (Tutor: 2019.3-present); Electronic Engineering Student Association of Science and Technology (Member: 2017-2018)

## RELEVANT COURSES

**Core Courses**
Communications and Networks (A-, 4.0/4.0)
Probability and Stochastic Processes (A, 4.0/4.0)
Signal and System (A+, 4.0/4.0)
Data and Algorithm (A, 4.0/4.0)
Fundamentals of Electronic Circuits and System (A, 4.0/4.0)

**Other Courses**
Convex Optimization (A+, 4.0/4.0)
Probability Theory (A, 4.0/4.0)
Complex Analysis (A-, 4.0/4.0)
Differential Equations (A-, 4.0/4.0)