KE LI

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EDUCATION

Cornell University Jun. 2021 - Aug. 2026 (Expected)

Ph.D. Student in Information Science, School of Computing and Information Science, Advisor: Prof. Cheng Zhang

Shanghai Jiao Tong University (SJTU) Sept. 2016 - Jul. 2020

B.S. in Information Engineering, School of Electronic Information and Electrical Engineering

- **Overall GPA**: 91.41/100 (Rank **3/158**) **Major GPA**: 91.16/100 (Rank **5/158**)
- Outstanding Graduates from Universities in Shanghai **(Top 5%)**

Carnegie Mellon University (CMU) Jul. 2019 - Sept. 2019

Research Assistant in Department of Electrical and Computer Engineering, Supervisor: Prof. Swarun Kumar

PUBLICATIONS

Locating Everyday Objects using NFC Textiles, Jingxian Wang, Junbo Zhang, **Ke Li**, Chengfeng Pan, Carmel Majidi and Swarun Kumar, The 20th International Conference on Information Processing in Sensor Networks (IPSN '21). ***Best Paper Award & Best Presentation Award*** May 2021

- Proposed a localization system design of a MIMO-enabled NFC reader which locates surrounding NFC tags as well as untagged conductive objects.
- The system achieved few centimeter-accurate location tracking of both tagged and untagged objects in proximity.
- The approach achieved an overall range of 20 cm of location tracking from the textile NFC reader.

A Constant Factor Approximation for *d*-Hop Connected Dominating Set in 3-Dimensional Wireless Network, Ke Li, Xiaofeng Gao, Fan Wu and Guihai Chen, IEEE Transactions on Wireless Communications (TWC), vol. 18, no. 9, pp. 4357-4367, 2019. Sept. 2019

- Designed a scheme to select cluster heads for a homogeneous network in a three-dimensional situation based on the concept of *d*-hop connected dominating set.
- Proposed a distributed approximation algorithm and proved its approximation ratio.
- Conducted numerical experiments with 100 nodes randomly distributed in a three-dimensional Wireless Sensor Network (WSN) to analyze and prove the efficiency of the algorithm.

QLEC: A Machine-Learning-Based Energy-Efficient Clustering Algorithm to Prolong Network Lifespan for IoT in High-Dimensional Space, Ke Li, Haowei Huang, Xiaofeng Gao, Fan Wu and Guihai Chen, The 48th International Conference on Parallel Processing (ICPP '19). Kyoto, Japan Aug. 2019

- Improved Distributed Energy Efficient Clustering (DEEC) algorithm with energy constraints and cluster coverage ranges of sensors in 3-dimensional WSNs taken into consideration.
- Adopted Q-learning scheme to choose cluster heads for routing packets of each sensor.
- Solved the Energy-Efficient Clustering Problem (EECP), which is an NP-Complete problem in the running time $O(kX)$, where k is the cluster number and X is the number of updates that Q-learning needs to converge.
- Conducted experiments with the algorithm and outperformed k-means clustering and an FCM-based algorithm in terms of network lifespan, packet delivery rate, and transmission latency.

RESEARCH & CONTEST EXPERIENCE

Design and Implementation of Broadcast Mechanism in Large-Scale IoT Sept. 2019 – Jun. 2020

Undergraduate Thesis at SJTU, Supervisor: Prof. Xiaohua Tian

- Designed and implemented the first parallel downlink scheme for backscatter communication.

- Proposed the parallel communication and control system under the broadcast mechanism in large-scale IoT.
- Verified the feasibility of my design on Keysight ADS, a simulation software, and on a PCB-based prototype.

Crowdsourcing Task Assignment Strategy and Optimization Based on Social Network Nov. 2018 – Dec. 2019

The 18th Innovation and Practice Plan for Undergraduates of SJTU, Supervisor: Prof. Xiaofeng Gao

- Optimized the task assignment scheme in spatial crowdsourcing and proposed efficient truth inference algorithms.
- Measured the fairness of the whole system using Jain's Fairness Index after a preliminary experiment.
- Processed the data and conducted experiments on online crowdsourcing platforms.

Modeling Trends of Global Languages and Location Options for New Offices Feb. 2018

American Mathematical Contest in Modeling, Meritorious Winner (Top 10%), Team leader

- Designed a Speaker Prediction Model that used study time of a language in a country to predict the distribution and numbers of various language speakers over time in different countries, based on the 10,000-Hour Rule.
- Proposed a Location Selection Model to provide location options for new offices using the Analytic Hierarchy Process and optimized the options with the Genetic Algorithm.

Development of Immersion Stereometric Manipulation Replacement Robot Apr. 2017 - Oct.2017

The 32nd Participation in Research Program of SJTU

- Designed binocular stereo glasses to observe the remote scene; Controlled the robot with a handle and gloves.
- Received an A grade as the team leader and best performer in the project.

HONORS & AWARDS

A-level Outstanding Scholarship of Shanghai Jiao Tong University (Top 1%) Nov. 2019

Scholarship awarded to outstanding students at SJTU

Tang Lixin Scholarship (Top 0.2%) Oct. 2019

Scholarship founded by Mr. Tang Lixin and awarded to Top 60 students at SJTU

National Scholarship*2 (3/158, 1/158) Oct. 2018, 2019

Top scholarship awarded to undergraduates in China for their achievements in academics

B-level Outstanding Scholarship of Shanghai Jiao Tong University*2 (Top 5%, Top 2%) Nov. 2017, 2018

Scholarship awarded to outstanding students at SJTU

Wen-Yuan Pan Scholarship (Top 5%) Dec. 2017

Scholarship founded by Wen-Yuan Pan Foundation

EXTRACURRICULAR ACTIVITIES & LEADERSHIP

Development Program for Excellent Student of SJTU, *Group Leader* Apr. 2017 – Jul. 2020

- Organized various activities, such as lectures, speech contests, volunteer programs, and summer social activities.
- Awarded Outstanding Participant Title in the 2018 Summer Social Practice of SJTU (Top 2%).

Master Distinguished Lecture, SJTU, *Director* May. 2017 - Sept. 2018

- Organized professional academic lectures and invited scholars for speeches, including 8 Nobel Prize Laureates.
- Oversaw the entire process of lecture, including brand building, publicity, directing, reception and recognition.

TECHNICAL SKILLS

- **Programming Language**: C / C++, Python, Java
- **Platforms and Tools**: MATLAB, NS2, LaTeX, LabVIEW

ENGLISH PROFICIENCY

- **TOEFL**: 108 (R30 L26 S23 W29) **GRE**: 321 = V-152 (54%) + Q-169 (95%), AW-4.0 (57%)