

# ZHEKAI (SCOTT) JIN

(929) · 354 · 6799 · jin4@cooper.edu · zhekaijin.github.io · NY, NY

## RESERACH INTERESTS

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Robotics, Perception, Distributed Embedded Systems, Machine Learning, Artificial Intelligence

## EDUCATION

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### The Cooper Union for the Advancement of Science and Art

B.Eng in Electrical Engineering - Computer Engineering track *Projected June 2019*

Grades Major GPA: 3.84/4.00 Overall GPA: 3.66/4.00

Honors Tau Beta Pi, Dean's List, School Honors, Half Tuition Scholarship, Innovation Merit

Courses related Artificial Intelligence, Natural Language Processing, Operating System, Databases, Data Structure & Algorithms, Software Development, Communication Networks

### Hangzhou Foreign Languages School

Graduated as Class Valedictorian *Sept. 2012 - May 2015*

## ACADEMIC RESEARCH

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### Cooper Mapper : Self-Driving Robot with MultiSensor Data Fusion *Sept. 2018 - Present*

*github.com/ZhekaiJin/the-Cooper-Mapper*

- Implemented real-time 2D Lidar SLAM and Stereo Visual SLAM based on GMapping & ORBSLAM
- Refactored and extended LOAM to support map management, relocalization, and ROS nodelet
- Working on robust resolution matching algorithms to reduce extrinsic multisensor calibration effort

### Cooper-IoT : Generic IoT Platform with Telepresence Utily *Jun. - Dec. 2017*

*github.com/ZhekaiJin/Cooper-IoT*

- Led a team of five designing IoT network for human traffic flow study with a stochastic queuing model
- Devised real-time WiFi & Bluetooth address tracking algorithm based on an implementation of wireless sensor network which is designed for peripheral environmental parameters acquisition
- Designed human detection algorithm with OpenCV to count and monitor human traffic flow
- Implemented real-time data-driven scheduler of lighting & heat and Achieved average 2% energy saving
- Realized Telepresence by presenting Mixed Reality and Stereo Rendering: integrating camera feed from robots & peripheral environmental data to head-mounted displays (S-PTAM, Unity, C#, C++)

## PROFESSIONAL EXPERIENCE

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### Momenta.ai : Lidar Research & Development Intern *May - Aug. 2018*

*Lidar Team & HD map Team on an end-to-end Lidar Perception system* *Beijing, China*

- Devised efficient Ground Detection & Semantic Road Segmentation algorithms with 98% precision
- Refactored Object Segmentation Modules with 20% memory usage drop by specialized structures
- Designed and implemented a robust real-time Object Tracking pipeline which is able to track even sparse point clouds based on 3D Interpolation, now deployed at Momenta's L4 self-driving solution.

### Totem Power Inc. : System Research & Development Intern *Jun. - Aug. 2017*

*Independent Research Project on a complete wireless charging system for Drones* *Bedford Hills, NY*

- Implemented circuits to incorporate security into wireless charging technologies without firmware breach and agile enough to ensure stable power transmission with minimal weight on the drone.
- Designed monocular-vision-based precise landing algorithm to counter the charging range limitation
- Presented a fully autonomous wireless charging pipeline which could perform charging for multiple drones in a queuing fashion under its coordination. (ARM, C)
- Developed RESTful APIs and workflow in a distributed environment for the real-time charging status monitoring website with visualization. (D3.js, Python, C)

### Didi Chuxing Technology Co. : Research Intern *Apr. - Jun. 2017*

*Dispatch Team on intelligent dispatching and dynamic pricing* *Hangzhou, China*

- Worked on automatic feature extraction on probabilistic time series forecasting models (PCA, LSTM)
- Turned Redis sentinel mode to proxy + consistent hashing mode with Redis latency reduced by 20%
- Automated tests with TestNG and Mockito and reached code coverage of 99%

- Designed PCB boards and circuits for CCTV cameras. (Altium, SystemVerilog, Cadence Virtuoso)
- Conducted various tests on performances of CCTV cameras PCB boards

## ACADEMIC PROJECTS

### EventPlus : Personalized Event Recommendation System

April. 2018 - Present

[github.com/ZhekaiJin/EventPlus](https://github.com/ZhekaiJin/EventPlus)

- Developed an interactive web page which allows users to search events and purchase tickets (JavaScript)
- Improved personalized event recommendation based on search history and favorite records
- Designed content-based recommendation algorithms to implement curated event recommendations
- Created Java servlets with RESTful APIs to handle HTTP requests and responses

### Tap News : Real Time News Scraping and Recommendation System

Mar. - May. 2018

[github.com/ZhekaiJin/Tap-News](https://github.com/ZhekaiJin/Tap-News)

- Implemented a data pipeline which monitors, scrapes and dedupes latest news (Redis, RabbitMQ)
- Built a web application for users to browse news (React, Node.js, RPC, SOA, JWT)
- Implemented a click event log processor which collects users' click logs to update preference models
- Designed and built an offline training pipeline for news topic modeling (Tensorflow, DNN, NLP)
- Deployed an online classifying service for news topic modeling using the trained model

### Pass2act : Passive Voice to Active Voice Article Converter

Mar. 2018

[github.com/ZhekaiJin/pass2act](https://github.com/ZhekaiJin/pass2act)

- Rated the best Natural Language Processing final project of the 2017 - 2018 academic year
- Designed decision tree able to handle conjugation & embedded passive sentences based on linguistics
- Built visualization rendering the transformation process with dependency parsing (spaCy, Python)

### Textcat : Text Categorizer based on Naive Bayes method on Unigrams

Feb. 2018

[github.com/ZhekaiJin/Textcat](https://github.com/ZhekaiJin/Textcat)

- Ranked 3rd place in performance among 107 classifier implementations throughout course history
- Implemented novel smoothing on Naive Bayes method to achieve over 90% accuracy on test corpus

### Collaborative Online Judge System : Cooperative Online Editor

Jan. 2018

[github.com/ZhekaiJin/Collaborative-OJ](https://github.com/ZhekaiJin/Collaborative-OJ)

- Implemented a web-based collaborative code editor supports multiple access/editing (Socket.io, Redis)
- Developed a web application for attempting coding problems like Leetcode (MEAN, Auth0)
- Built a user-code executor service which builds and executes users code (Docker, Flask)
- Refactored system throughput to 150% by decoupling services (REST) and loading balancing (Nginx)

### Celestial Mechanics Application : Fuel-efficient Spaceship Trajectory Study

May. 2017

[github.com/ZhekaiJin/Celestial-Mechanics-Application](https://github.com/ZhekaiJin/Celestial-Mechanics-Application)

- Implemented solarsystem animation based on OpenGL GLUT (C++)
- Optimized fuel-efficient spaceship trajectory based on three-body model & four-body model (Python)
- Explored deterministic chaotic phenomenon within optimal path searching (OpenGL & C)

## LEADERSHIP & EXTRACURRICULAR ACTIVITIES

Cooper HyperLoop - Communication Team Lead

Sept. 2018 - Present

The Cooper Union Computer Center - System Administrator &amp; Operator

Sept. 2017 - Present

Cooper Union SMAC<sup>2</sup> Lab - Initiator & Research Lead

Jun. 2017 - Present

Cooper Motorsport (Cooper Formula SAE) - Electronics Team Vice Lead

Sept. 2016 - Sept. 2017

Cooper Motorsport - Electronics Team Member

Sept. 2015 - Sept. 2016

Cooper MicroController Club - Club Member

Sept. 2015 - Sept. 2016

## COMPUTER SKILLS

<b>Languages</b>	C++, C, Java, Python, Go, Matlab, JavaScript, SQL, Shell Scripting
<b>Databases</b>	MongoDB, Cassandra, DynamoDB, Oracle, MySQL, PostgreSQL, MsSQL
<b>Technology</b>	MRPT, PCL, Ceres, g2o, gtsam, Webots, scikit-learn, NLTK, PyTorch, Kafka, Hadoop, Spark, Pig, Tomcat, AWS RDS/Lambda/EC2/EMR/S3
<b>Training</b>	Robotics Engineer Nanodegree, Self Driving Engineer Nanodegree @ Udacity