

# ZHEKAI (SCOTT) JIN

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## RESERACH INTERESTS

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

## EDUCATION

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

Bachelor in Electrical Engineering - Computer Engineering track

*Projected June 2019*

Grades

Major GPA: 3.81/4.00 Overall GPA: 3.63/4.00

Honors

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

Courses related

Natural Language Processing, Artificial Intelligence, 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

- Implemented real-time Lidar SLAM (Planar) and VSLAM (Stereo) based on ORBSLAM & GMapping
- Working on robust resolution matching algorithms to reduce extrinsic multisensor calibration

### Cooper-IoT: Generic IoT Platform with Telepresence Utily

Jun. - Dec. 2017

- Led a team of five designing IoT network for study of population flow with a stochastic queuing model
- Implemented real-time acquisition for WiFi & Bluetooth address and peripheral parameters. (Python)
- Designed human detection algorithm with OpenCV to monitor population flow and human counting
- Implemented real-time scheduler of lighting & heat with data 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 and Lane Clustering & 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 Inc. : Software Development Intern

Apr. - Jun. 2017

*Dispatch Team on order dispatching and dynamic pricing*

*Hangzhou, China*

- Worked on automatic feature extraction on probabilistic time series forecasting model (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%

**Shanghai IC Research and Development Center Ltd. : Research Intern** May - Aug. 2016  
*Circuit Testing Team* Shanghai, China

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

## ACADEMIC PROJECTS

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**EventPlus: Personalized Event Recommendation System** April. 2018 - Present

- 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 recommendation
- Created Java servlets with RESTful APIs to handle HTTP requests and responses

**Tap News: Real Time News Scraping and Recommendation System** Mar. - May. 2018

- 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

- 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

- 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

- 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 API) and loading balancing (Nginx)

**Celestial Mechanics Application: Fuel-efficient Spaceship Trajectory Study** May. 2017

- 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

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Cooper HyperLoop - Communication team Lead	Sept. 2018 - Present
Cooper Motorsport (Cooper Formula SAE) - Electronics team vice Lead	Sept. 2016 - Sept. 2017
Cooper Motorsport - Electronics team Member	Sept. 2015 - Sept. 2016
Cooper MicroElectronics club - club Member	Sept. 2015 - Sept. 2016

## COMPUTER SKILLS

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<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>	ROS, PCL, OpenCV, g2o, Ceres, gtsam, scikit-learn, NLTK, PyTorch, Kafka, Hadoop, Spark, Pig, Tomcat, AWS RDS/Lambda/EC2/EMR/S3
<b>Operating Systems</b>	Linux, Windows, OS X
<b>Training</b>	Robotics Engineer Nanodegree, Self Driving Engineer Nanodegree @ Udacity