ZHEKAI (SCOTT) JIN

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EDUCATION

Carnegie Mellon University *Projected May 2021*
M.S. in Robotic Systems Development

The Cooper Union for the Advancement of Science and Art *Sept. 2015 - May 2019*
B.Eng, Major in Electrical Engineering, Minor in Computer Science, cum laude
Honors Eta Kappa Nu, Tau Beta Pi, Dean's List, School Honors, Half Tuition, Innovation Merit

PUBLICATION

A MultiSensor Data Fusion Approach For Simultaneous Localization And Mapping
Zhekai Jin, Yifei Shao, Minjoon So, et al.
IEEE Intelligent Transportation Systems Conference (ITSC), 2019, in Press
1st Place in the IEEE Region 1 2019 Student Papers Competition, Oral Presentation

ACADEMIC RESEARCH

Livox SLAM: a modular Perception system based on DJI's Livox Lidar May - Aug. 2018
Biorobotics Laboratory, Carnegie Mellon University *Pittsburgh, PA*

· Established a robust Lidar SLAM framework for Livox with its non-repetitive scanning patterns
· Incorporated intensity-based features into scan matching for high resistance to aggressive motion

Cooper Mapper : Self-Driving Robot with MultiSensor Data Fusion Sept. 2018 - May 2019
Autonomy Lab, Cooper Union *NY,NY*

· Implemented real-time 2D Lidar SLAM and Stereo Visual SLAM based on Cartographer & ORBSLAM
· Refactored and extended LOAM with map management, relocalization, and pose-graph optimization
· Working on robust resolution matching algorithms to reduce extrinsic multisensor calibration effort

Cooper-IoT : Generic IoT Platform with Telepresence Utilty Jun. - Dec. 2017
Autonomy Lab, Cooper Union *NY,NY*

· 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

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. : Software Research & Development 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%

Shanghai IC R&D Center Co., Ltd. : Research Intern May - Aug. 2016
Circuit Testing Team *Shanghai, China*

· 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

· 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

· 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

· 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

· 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

Celestial Mechanics Application : Fuel-efficient Spaceship Trajectory Study May. 2017
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
Cooper Union Computer Center - System Administrator & Operator	Sept. 2017 - Present
Cooper Union SMAC^2 Lab - Initiator & Lead Research Assistant	Jun. 2017 - Present
HackCooper Hackathon - Software & Embedded Programming Mentor	Oct. 2018
Cooper Motorsport (Cooper Formula SAE) - Electronics Team Vice Lead	Sept. 2015 - Sept. 2017

COMPUTER SKILLS

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