Yang Song

Senior Algorithm Engineer

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Education

University of South Carolina — *Columbia, SC*

Ph.D. in Computer Science & Engineering — *2010 - 2015*

University of New Mexico — *Albuquerque, NM*

M.S. in Electrical Engineering — *2008 - 2009*

China University of Geosciences — *Wuhan, China*

B.S. in Electrical Engineering — *2003 - 2007*

Experience

Lotus Tech Innovation Centre — *Raunheim, Germany*

Senior Algorithm Engineer — *Apr. 2022 - Current*

- Lead data engineering and cloud architecture for ADAS (Advanced Driver Assistance Systems) function development of the **Lotus** Eletre and Emeya models in the EU and US markets.
- Oversee data compliance, processes, and management activities related to ADAS testing data and production data, ensuring adherence to industry regulations and standards. Develop and enforce cloud governance and security policies to protect sensitive data and ensure compliance with regulatory requirements
- Design and implement streaming data processing services on AWS for vehicle data collection, utilizing Java, AWS MSK, AWS Glue, and AWS Redshift.
- Lead regular cloud DevOps operations to maintain and optimize cloud infrastructure and AWS-based services, focusing on performance, reliability, and cost-efficiency. Ensure disaster recovery and business continuity plans are in place and regularly tested for all cloud-based solutions
- Prepare and present detailed architecture proposals and cost analyses to senior management.
- Provide technical leadership and mentorship to junior cloud engineers, fostering a culture of continuous learning and improvement.
- **Accomplishment:** Achieved a reduction in AWS costs by over 50% through the application of 1st Principle Thinking, minimalist service design, and serverless architecture migration.
- **Tech Stack:** Python, Java, Kubernetes, Docker, Jenkins, Gitlab, AWS IAM, EC2, EKS, ECR, S3, RDS, ElastiCache, Opensearch, Glue, Redshift, IoTCore, MSK, Lambda, Serverless

Aptiv — *Wuppertal, Germany*

Senior Algorithm Engineer — *Aug. 2019 - Mar. 2022*

- Main algorithm developer of the radar processing on **Motional**'s Robotaxi platform.
- Led algorithm design, implementation and optimization of the MRR radar library: radial velocity dealiasing, clustering, reflection detection (Python, Sklearn, C++) from proof to concept phase to production.
- Led the communication with clients and define performance metrics to measure range rate, azimuth and reflection algorithms to finalize the software requirements and specifications.
- [Ownership] Designed evaluation pipeline for radar processing library and implemented Python-based regression tests using ground truth data.
- Led lane change prediction feature functions design in the Advanced Driver Assistant System (ADAS) for **PSA**.
- Collected road testing data for the lane change model and created labeling pipeline to generate the ground truth from radar tracker and camera data (Python, OpenCV).
- Designed performance metrics and implemented data pipeline to evaluate performance of the prediction module offline (Python, Sklearn).
- Contributed to the API Design (OOD) of the system error handling module (UML, C++14, ROS) and delivered with ASPICE development life cycle.
- **Tech Stack:** C++17, C++14, ROS, Python, GTest, Bazel, UML, Jenkins, AUTOSAR, Git, ASPICE, Polarion, Matlab

Groupon International Limited — *Dublin, Ireland*

Software Engineer — *Aug. 2018 - May. 2019*

- Led the GDPR data compliance for all EMEA consumers.
- Developed REST back-end API on Rails to interact with front-end features (EmberJS) for the EMEA merchandise platform.
- Mentored the intern to implement and deliver the system monitoring metrics using Splunk.
- **Tech Stack:** Rails, RSpec, Capistrano, EmberJS, MySQL, Docker, Jenkins, DotCI, Cassandra

Groupon, Inc. *Seattle, WA*

Software Engineer *Feb. 2016 - Aug. 2018*

- Developed features for a core REST back-end service using Java to send email and mobile notifications to over 6M customers engagement daily.
- Contributed to the back-end job migration from Hive query to Spark and achieve 10x performance improvement on the on-premises cloud architecture, collaborated with the Data Engineering team.
- Optimized the system architecture, cost, and performance by submitting Spark jobs to YARN directly (deprecated system managed Hive queries with AWS SWF and SQS).
- [Ownership] Optimized and migrated a Hive SQL-based batch data pipeline to Spark 2.4 on Hadoop.
- [Ownership] Designed and optimized the data pipeline over Hadoop and Cassandra clusters using Spark.
- **Accomplishment:** The batch data pipeline takes 50+% less runtime and 80+% less storage to pull data from the Enterprise Data Warehouse and write to Hadoop. Also performs 2x faster data writing from Hadoop to Cassandra clusters.
- **Tech Stack:** Java8 (Play), Scala, Spark, Maven, Yarn, Capistrano, Splunk, Jenkins, Docker, DotCI, MySQL, Hadoop, Cassandra, Redis, Hive, Swagger, AWS

Auro Robotics, Inc. (YC-backed start-up, acquired by Ridecell in 2017) *Sunnyvale, CA*

Robotics Engineer Intern *Jun. 2015 - Aug. 2015*

- Constructed an operational electric self-driving shuttle from scratch with 3 founders and 4 engineers in three months (seed round investment: $120K).
- Implemented a waypoint-following path planner using GPS data and a RRT* path planner using LiDAR data with ROS (C++/Python).
- Compared and optimized performance of different local planners (A$*$, RRT$*$) by conducting ROS simulations and road tests.
- **Accomplishment:** Tech media's spotlight at YC Demo Day Summer 2015 & receive $2.1M investment.
- **Tech Stack:** ROS, CMake, Gtest, C++11, Python

Publications

Y. Song and J. M. O'Kane, "Repeating Patterns of Mobile Robots: A Provably Correct Decentralized Algorithm. I", IROS 2016.

Y. Song and J. M. O'Kane, "Decentralized formation of arbitrary multi-robot lattices", ICRA 2014.

Y. Song and J. M. O'Kane, "Comparison of constrained geometric approximation strategies for planar information states", ICRA 2012.

D. Miklic, S. Bogdan, R. Fierro, Y. Song, "A grid-based approach to formation reconfiguration for a class of robots with non-holonomic constraints", European Journal of Control 18 (2), 162-181, 2012.