

Keith Chester

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Brain Corp

Senior Software Engineer

2018 - Present

Architected and developed numerous systems responsible for the management, coordination, and control of a global fleet of over ten thousand robots. Developed code for a monolithic Golang application that provided a RESTful API for robot configuration and management, as well as a distributed state system for robot data. Later broke our monolith web service down to microservices and began migration to Google Cloud Platform (GCP).

- **Data Pipeline** - Led a team of engineers to architect and develop an efficient and scalable pipeline for data collection across Brain Corp's robotic fleet while providing tooling for application-level real time reaction to data via Apache Kafka. The pipeline optimized LTE data usage to manage fleet-wide costs and was designed to be both cloud agnostic (AWS and Azure targeted) and client-side applications were resilient to poor network connectivity
- **Scaling Improvements** - Responsible for developing key features to improve scalability of the platform's simultaneous online devices from a hundred robots to tens of thousands. Developed an AWS RDS PostgreSQL database pooling system that distributed application server load evenly across replicas while removing overloaded databases. Programmed an additional system to allow services to change behaviour based upon database load and performance
- **Data Analytics ETLs and Streaming** - Coordinated with the Data Analytics Team to design ETLs to migrate hundreds of gigabytes of monthly incoming data from various services into Snowflake DB
- **Webhooks and Event Pub/Sub** - Built an event-based notification and webhook system that handled over 100 million events a month
- **Authorization** - Implemented an authorization system on PostgreSQL and SQLite queries to provide customer-oriented multi-tenancy to our APIs and data collection
- **Team Coordination** - To gather requirements for internal services, routinely coordinated across multiple departments, including Research and Development, Robot Application Teams, Manufacturing, and more

Technologies: AWS RDS, S3, Kinesis, Elasticache (Redis), PostgreSQL, Kubernetes, GCP Cloud Storage, Cloud Function, Pub Sub, Firestore, Apache Kafka, Terraform, Protocol Buffers, GRPC, Golang, Python

Fusion Marketing

Senior Developer

2013 - 2018

Originally hired to be a full stack web developer, transformed the position into developing custom technological solutions - onsite interactive crowd pleasers, custom onsite CRM, social media sharing tools, and white-labelable products. Acted as a Research and Development Lead and then as a Senior Developer.

- **Custom Technology** - Developed novel applications of technologies such as BLE beacons, virtual and augmented reality, computer vision, and IoT solutions towards client-oriented marketing products and services
- **Cloud Microservices** - Created reusable microservice backends on AWS for quicker deployments and white-labeling of products

- **Full Stack Developer** - Programmed and deployed client sites and service applications for dozens of clients as a full stack developer. Crafted custom web pages from Photoshop designs, implemented Angular.JS applications, and created RESTful backends
- **GigaSnap** - Created a white label brand-able product that would create dynamic zooming selfies from over a mile away. The product, GigaSnap, would control an array of cameras with varying lenses and zooms over a long range ZigBee radio. Custom Electron applications integrated with the radios and controlled the cameras. Images snapped by the cameras would be uploaded to a cloud service that would generate the dynamic zooming image

Technologies: AWS EC2, S3, DynamoDB, GCP Firebase, MySQL, CouchDB, Electron, Angular.JS, Embedded C, Typescript, node.js, Python, C#, WordPress, PHP, Java Spring

Hub City Media

Application Developer

2010 - 2013

Consulted with clients to design and develop identity management solutions for large enterprise businesses

- **Project Lead** - Coordinated teams (including international remote developers) in developing customized enterprise solutions
- **Enterprise Application Development** - Created, updated, and maintained several enterprise Java and C# applications in finance, healthcare, and government industries

Technologies: MySQL, Python, C#, PHP, Java

Education

Masters in Robotics Engineering

2021-present

Worcester Polytechnic Institute (WPI)

- Recently began attending online night courses to earn my Masters in Robotics Engineering while continuing my career

Bachelors of Science in Robotics Engineering

2005 -2009

Worcester Polytechnic Institute (WPI)

Ask Me About...

<https://github.com/hlfshell/>

I am an avid technology enthusiast. I have many projects that would be excellent topics of conversation.

Evolving Cars

To explore evolutionary algorithms on problem solving, I created a rudimentary racing game in Python and then created an algorithmic approach to evolve neural networks to solve the racing game.

Deep Q Network

I have recently explored deep reinforcement learning - DQNs, REINFORCE, and A3C. The Deep Q Network repository is my recent in-depth exploration for training techniques for DQNs.

SafeStop

A golang module for handling multiple safe-shutdown procedures for large applications with multiple operating services. SafeStop allows a singular shutdown call to proliferate to each service and safely await (with timeout) for each service to wind down.

serial-synapse

For several projects - both professional and personal - the ability to coordinate multiple microcontrollers with a host embedded Linux system with a network connection became necessary. To this end I developed *serial-synapse* to modularize this process

- *serial-synapse* allows node.js users to bridge communication to and coordinate several microcontroller devices while being able to maintain time-critical local code execution on the microcontrollers
- Handles asynchronous communication between devices and automatically generates a dynamic and easy to use API for developers
- Powered dozens of real world products and projects during my time at Fusion Marketing
- When paired with *serial-synapse-socket* - another open source module - the generated dynamic API is exposed via websockets