

## KEITH CHESTER

### SUMMARY

Well-rounded solutions minded engineer with a Bachelor of Science in Robotics Engineering. Technological polyglot with a career of unique projects designed in creating completely custom technological solutions.

### OBJECTIVE

To expand career from web and application development to focus more on robotics, deep learning, and developing innovative technology. Seeking employment that will expand my skills and challenge me regularly.

### EDUCATION

#### DEEP LEARNING NANODEGREE, UDACITY, 2018

- While the course covered Keras, the majority of the work is done in Tensorflow
- Learned to configure and set up a deep learning environment
- Covered deep neural networks and the math behind back propagation | <https://bit.ly/2jg3fDB>
- Applied the process of transfer learning between neural networks
- Used convolutional neural networks to create image classifiers | <https://bit.ly/2HW71QB>
- Studied and utilized recurrent neural networks and LSTMs | <https://bit.ly/2HVvK7B>
- Created Generative Adversarial Networks for generating fake faces via the *CelebA* dataset, and studied how to use them for semi-supervised learning for smaller datasets | <https://bit.ly/2JDf9Ta>
- Used reinforcement learning to teach a virtual drone in the OpenAI gym to fly

#### SELF DRIVING CAR NANODEGREE, UDACITY, 2017-2018

- Completed the first term of the nanodegree covering computer vision and deep learning
- Learned and applied computer vision techniques to detect lane lines in videos of driving | <https://bit.ly/2Hvb2fa>
- Introduced to convolutional neural networks, Tensorflow, and Keras to create traffic sign classifiers | <https://bit.ly/2r4zvx6>
- Trained a deep neural network on a driving simulator to copy my driving style based on image input | <https://bit.ly/2FmDeem>
- Created a vehicle detection pipeline solely using standard computer vision techniques (Histogram of Gradients, color space exploration, machine learning classifiers, etc) and then explored how to apply deep learning techniques to improve it (such as *YOLO* or RCNNs) | <https://bit.ly/2I59dTc>

## **BACHELORS OF SCIENCE IN ROBOTICS ENGINEERING, WPI, 2005-2009**

- Robotics Engineering consisted of a mix of mechanical, electrical, and computer engineering
- Encouraged learning technologies from a broad spectrum of areas rapidly
- Created several robots and projects that handled localization, path planning, kinematics calculation, and inter-component communication

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### **WORK HISTORY**

#### **SENIOR DEVELOPER, FUSION PERFORMANCE MARKETING, SAINT LOUIS, MO**

2013-Present

- Held numerous roles as Digital Team defined its role in the company – from Developer to Research and Development Lead to Product Developer to Senior Developer
- As Research and Development Lead, looked into applying technologies such as BLE beacons, VR, AR, Computer Vision, and IoT to client oriented solutions
- As a Product Developer, developed
  - a re-usable microservice based backend for quicker deployments and white-labeling of products (Core, described below)
  - white-label-able projects such as a zoom-able half-mile selfie (GigaSnap, described below), video/gif selfie booths, small interactive games, and more
- Was depended upon making any weird request or requirement work, and figuring out how to make it work well

#### **LEAD DEVELOPER, HUB CITY MEDIA, EDISON, NJ**

2010-2013

- Led teams (including overseas developers) in developing customized solutions for Sun Microsystems and Oracle identity management products

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### **NOTEABLE CAREER PROJECTS**

#### **CORE + REACTOR – MICROSERVICES FOR FUSION MARKETING**

- Created Core with the goal of creating easy to use HTTP-based microservices for other developers at Fusion, speeding up our already rapid application development timelines
- Core would parse headers alone, authenticate and authorize requests through *Can They* (described below), and stream the request and resulting response to and from the intended service
- Microservices were ran in Docker containers and used Consul for service discovery by Core
- Reactor was an administrative console and consumer data store designed for multiple clients and reporting

- Powered many applications and products for years

#### **GIGASNAP**

- Created a white label brand-able product that would create dynamic zooming selfies from up to a half mile away | <https://bit.ly/2Kk8j6m>
- Created ZigBee wireless radio networking tools to allow a tablet Electron app to control the cameras from a great distance
- Automated Adobe After effects, AWS Video Transcoder service to deliver final product to consumer

#### **MARRIOT INNOVATION WALL**

- Worked on a team to create the technology for an interactive wall that toured the world for Marriott | <https://bit.ly/2FmuCo2>
- Created a heartbeat controlled music player and light controller
- Used conductive paint to change a projection mapped surface through Unity
- Utilized infrared cameras and computer vision to perform hand tracking for projection mapping on a geodesic surface in Unity

#### **AND MORE...**

- House-made dynamic green screen photo and gif booths
- Video experiences
- Office wide RFID controlled Chromecast'ed Nerf War | <https://bit.ly/2FmwYmS>
- ...and many more

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#### **OPEN SOURCE PROJECTS**

All projects listed below can be found on my Github profile for the user *hlfshell*

##### **SERIAL-SYNAPSE**

- Before serial-synapse no library allowing node.js to take control of one or several embedded microcontroller devices while still allowing the device to have time-critical response with local code execution | <https://bit.ly/2JyHJow>
- Created serial-synapse to handle asynchronous communication between and generate a dynamic API for easier programming of hardware through node.js
- This module powered dozens of projects throughout Fusion Marketing
- Created serial-synapse-socket that takes a generated dynamic API and exposes it through sockets, for instant IoT-ification of a project | <https://bit.ly/2HC2tzu>

##### **CAN THEY**

- While building Core to control microservices at Fusion, there was no flexible lightweight library for ACL controlled permissions | <https://bit.ly/2KmUbsY>

- An authorization (not authentication) ACL versus JSON checker for node.js
- Optional built in express middleware for easier, cleaner inclusion into express applications

#### NEEDLE-SWAP

- Unit testing with mocking modules in node.js was difficult without heavily changing coding styles – to combat this needle-swap was created | <https://bit.ly/2HAcBsl>
- Easier node.js object mocking via overwriting the require function to hot-swap mocked objects in

#### MQTT-SCHEDULER

- During a binge of automating various household areas, there was a discovered need to incorporate scheduling and interval MQTT responses | <https://bit.ly/2JDrOoW>
- node.js command line tool for scheduling MQTT broadcasts at set times or intervals
- Was used during my briefly lived home automation binge, powering lights, automated gardening tools, and more

#### LIFX-MQTT

- node.js command line tool for exposing UDP controllable LIFX Wi-Fi light bulbs to an MQTT network | <https://bit.ly/2HzG05S>

#### AND MORE...

- DIY thermal camera w/ tablet app for people counting, Raspberry Pi MMS picture doorbell, additional tools such as node-packer or controlled-merge, slackbots that warn users of nearby Pokémon in Pokémon Go or control RGB LED strips on a desk, and many more...

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### SKILLS

**Programming Languages:** node.js, Python (2.7 + 3), JavaScript, Typescript, HTML/CSS, C, PHP, C#, Java

**Machine Learning Frameworks:** Keras, Tensorflow, scikit-learn

**Deep Learning Models Familiar With:** Deep Neural Networks, Convolutional Neural Networks, Auto-Encoders, Recurrent Neural Networks, Generative Adversarial Networks

**Cloud Services:** AWS, Digital Ocean, Heroku

**Databases:** MySQL, PostgreSQL, Firebase, MongoDB, DynamoDB, CouchDB

**Additional Technologies:** OpenCV, Electron, Docker, Linux, AVR microcontrollers, Angular.JS, Raspberry Pi, IoT, MQTT

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### COMMUNITY EFFORTS

#### NODE.JSTL, 2015-2017

- Created a meetup group for discussing node.js and related technologies for the St Louis Area

- Organized meetings, occasionally handled video equipment for recording, scheduled speakers, acquired sponsorship
- Often gave talks covering topics such as
  - Introduction to node.js and Express | <https://bit.ly/2FqX609>
  - Mocha and Chai for Testing | <https://bit.ly/2HB4esr>
  - Alexa Voice Applications | <https://bit.ly/2vWxGrF>
  - Electron
  - Hardware, electronics, and node.js

#### **JSTL, 2016-2018**

- Created a meetup for discussing JavaScript and frontend technologies
- Scheduled speakers and arranged sponsorship

#### **BUILD.STL, 2016**

- Founded a group to teach and encourage people to become involved with do it yourself electronics projects
- Scheduled speakers
- Gave talks on
  - Functional 3d Printer Design | <https://bit.ly/2r8uDaZ>
  - DC Motors – Making things Move | <https://bit.ly/2HzO4Uu>

#### **CODE FOR THE PEOPLE, 2016-2017**

- Organized a group that combined motivated software developers to contribute to open source development for political causes and to help local government

#### **FAIR USE BUILDING AND RESEARCH (FUBAR) LABS, 2010-2012**

- Joined FUBAR early in its existence to help found the hackerspace and its rules
- Spearheaded establishing the first location for FUBAR, negotiating the contract for rent
- Taught several courses – including soldering classes, an introduction to microcontrollers, web technologies for DIYers, and more

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## **STARTUP EFFORTS**

### **WONDERVENT**

- Allow consumer crowdfunding for events and adventures to remove the risk of financial obligation from potential organizers
- Built in node.js, utilizes Stripe for payment solutions

### **DATESONIC**

- Provide real time speed dating events culminating in protected number-hiding phone calls between potential matches
- Built in PHP and node.js, utilizing Twilio for the telephonic technologies