Marko Elez

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Education

Rutgers University September 2018 - May 2021 (1 year early)

- Bachelor of Science (B.S.) in Computer Science, 3.8 GPA.
- Coursework includes Algorithms and Data Structures, Systems Programming, Distributed Systems, Computer Architecture, Operating System Design, Linear Algebra, Multivariate Calculus, and Real Analysis.

Experience

Amazon, Software Engineering Intern May 2020 - Aug 2020

- Joined the Last Mile Route Planning team.
- Wrote a self-service API designed to allow operations controllers around the United States to modify region-specific algorithm configurations in order to evaluate and optimize delivery routing protocols.
- Utilized Amazon CDK to facilitate region based configurations, AWS Lambda functions backed by APIGateway to provide accessible API endpoints protected by a permissions framework with stored configurations in Amazon S3.
- Designed a highly available versioning system for regional S3 configurations coupled with a request audit history system using DynamoDB.
- Wrote thorough unit and integration tests and adhered to strict quality assurance protocols.

Unimetrics.io, Founder and CTO December 2019 - May 2020

- Founded Unimetrics Inc., a tech startup designed to connect college applications with mentors at top universities nationwide, gained over two thousand users in the first few weeks of launching with hundreds of daily active users since.
- Accepted into Johns Hopkins' premier startup accelerator (FFU), awarded top scholarship in the DMV area (backed by Early Charm Ventures and Suitland Ventures).
- Developed platform backend using GCP Firestore database with Cloud Functions and client authentication with an administrator API written in Go using stateless authentication (JWTs). Designed and implemented frontend platform features including realtime messaging, document collaboration, a scalable question forum, and a task management system using React.

Rutgers Cyber Physical Systems Laboratory, Computer Vision Research Assistant March 2019 - September 2019

- Conducted NSF funded research involving realtime dynamic control and adaptation of networked aquatic robots in resource-constrained and uncertain environments.
- Developed a basic version of SLAM monocular visual odometry (C++ and Python) designed specifically for mapping aquatic environments without relying on GPS input.
- Worked on implementing adaptive sensing algorithms and computer vision techniques using a Raspberry Pi designed to facilitate navigation and data collection.
- Collaborated with a team of student researchers adhering to an iterative research and testing cycle.

Projects

pySLAM, Monocular SLAM

- Implemented basic version of monocular SLAM able to compute camera pose and trajectory in real-time.
- Evaluated on KITTI Odometry dataset and custom mp4 video files with frame by frame keypoint detection, extraction, and triangulation using OpenCV.
- Featured 3D point map visualization using python bindings for pangolin and graph optimization using g2o.

pyAutoSim, Autonomous Vehicle Agent

- Trained virtual car agents using several convolutional neural networks including Alexnet, ResNet, and Inception-v4 to navigate virtual environment and perform tasks autonomously.
- Agent was able to successfully Udacity's Open Source Self-Driving Car Simulator using direct input frames generated and processed using Python in conjunction with OpenCV, numpy, and MSS.

MIT 6.824, MIT Graduate Course on Distributed Systems

- Implemented basic version of Google MapReduce, a distributed compute framework for running large jobs in parallel.
- Implemented RAFT consensus protocol in order to facilitate replication and sharding for a distributed key value store.

Skills

- **Languages:** Python, C, Java, JavaScript, Go, C++, Dart, HTML, CSS
- **Libraries/Frameworks:** React, Tensorflow, Pytorch, OpenCV, Node.js (Express.js), Django, Flask, Redux, Flutter
- **Database:** MongoDB, Google Firestore, AWS DocumentDB, AWS DynamoDB
- **Additional:** Docker, AWS, Git, UNIX, Jupyter LaTeX, Adobe Suite (XD, AI, PS), RPC, JWT authentication