# Michael Appel

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## Education

**University of Maryland, College Park**                                                                Class of 2020
B.S. Computer Engineering
*Research and Awards:*
- **Convolutional Neural Networks applied to Stock Data** - Received Academic credit for research in Jan 2020. Project supervised by Dr. Sennur Ulukus, ECE department at University of Maryland
- **Innovation Award for OSV design -** Autonomous Over Sand Vehicle (Intro to Engineering Design)**,** May 2017

## Work Experience

**Capital One Financial, Senior Software Engineer**                                        August 2020 – Present
Develop and manage critical fraud decisioning systems processing credit card payments. Application sees 3-5M payments/day, up to 300 TPS, ~200ms response time, Active-Active. Platform includes 6 services, 2 ML Models, 20+ Feature Compute pipelines, and integrates with 14+ systems to balance customer experience with industry-leading fraud capture. Mentor junior engineers and regularly represent the platform in presentations to leadership.

**Led and Implemented Infrastructure Re-Design and Serverless Migration**
- Redesigned traffic flow by routing non-critical API-Gateway calls to within the application itself resulting in 40ms improvement in response time
- Migrated the entire platform from EC2 to Fargate while cutting away bloat and consolidating logs in Splunk, resulting in 50% cloud cost reduction, and increasing release velocity from 1.74 per week to 4 releases per week
- Implemented traffic mirroring enabling a seamless, 0-risk switch to the new Fargate infrastructure in production
- Implemented automated regional failover and deployment rollback, earning Capital One Platinum Resiliency Status for the platform

**Drove Data Orchestration Improvements**
- Re-designed and optimized feature request orchestration across the platform, reducing traffic by 50% on multiple downstream services and databases
- Consolidated feature management across the platform, creating a seamless feature catalog for partners, 50% reduction in DB calls, 6x reduction in publishing events, 20ms response time improvement, and increased the platforms capacity to 350+ TPS

**Spearheading Real Time Data**
- Pioneering real time data availability to address weaknesses in daily batch compute
- Designed intuitive and efficient Non-Relational Databases and prototyping integration with the fraud platform
- Meeting with partners and leadership to garner support, and working with partners to develop a real-time data product for the Payment Fraud use case

**Freedom Consulting Group, Software Engineering Intern**                                June 2019 – April 2020
Prototyped ML Workflow to train an Object Detection Model to identify power substations in satellite imagery. Iterated on, trained, and successfully ran model on satellite imagery.
- Developed an autolabeler using computer vision techniques to produce thousands of labeled images to use as training data for the model
- Tested model on real satellite imagery in Maryland and rapidly prototyped a conversion workflow to display model results on GIS software to present results to partners

## Projects

**FX Trading Platform**
Created and deployed to AWS a trade orchestration service that reads live FX data, calculates indicators and signals, and evaluates strategies to then place trades on a live demo account.
- Developed template system for strategies allowing for rapid iteration, recursively evaluated configurable conditions linked to indicators, and configurable actions
- Created a library of re-usable indicators in python
- Built backtesting environment that pulls historical data, executes and evaluates strategies, and displays entries, exits, and signals on a candlestick chart
- Created prototyping environment that pulls historical data, calculates custom indicators on the data, and shows indicators alongside a candlestick chart

## Skills

**Skills:** Java, Python, SQL, Spring, Docker, Maven, Amazon Web Services, Splunk, Snowflake, Kafka, Non-Relational Database Design, ML Model Orchestration, High TPS/Availability Applications, Feature Compute Pipelines
**Certifications:** AWS Solutions Architect Associate