M.Furkan Oruc

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Atlanta, GA
Google Scholar

Education

Georgia State University — Atlanta, US
M.Sc. in Statistics with Computer Science, GPA: 4.02/4.00 — *December 2020 - December 2022 (Expected)*
Courses: *Computer Vision, Deep Learning, Digital Image Processing, Database Systems, Applied Multivariate Statistics, Linear Statistical Analysis, Applied Bayesian Statistics, Recommendation Systems (in progress), Computational Statistics (in progress), Experimental Design (in progress)*

Ozyegin University — Istanbul, Turkey
M.Sc. in Civil Engineering (Concentration: M.L. in Maritime Traffic) — *2020 - 2022*
Courses: *Machine Learning and Artificial Neural Networks (by Alpaydin), Integer Programming, Machine Learning in Finance*

Bogazici University — Istanbul, Turkey
B.Sc. in Civil Engineering — *2014 – 2019*
Courses: *Applied Stochastic Modeling, Fluid Dynamics, Systems Engineering, Investment Management, Risk & Decision Analysis*

The University of Queensland — Brisbane, Australia
Study Abroad (Non-Degree) — *January 2018 – July 2018*

Professional Experience

Allen Institute for Artificial Intelligence (AI2) — Seattle, US
AI Research Intern, Applied Science — *June 2022 – Present*
- Prototyping a novel methodology to predict spatio-temporal fishing hot spots in real time via open source time series satellite environmental data using machine learning. Led the process from data labeling to model building.

Google — Istanbul, Turkey
Data Analyst, Ads Marketing — *January 2020 – December 2020*
- Leveraged Google's Search, Youtube and Trends data to provide weekly insights to non-technical EMEA partners about rapidly changing trends during Covid-19 via a comprehensive business sense. Reached 30,000 SMBs.
- Led a plan to distribute 1M USD Fund via data based strategy: Performed linear modeling for EMEA long tail market (+30k Businesses) and identified and worked with 30 customers for end to end e-commerce digitization.
- Launched local Grow My Store and Rising Retail Categories products, ran A/B tests and achieved highest b2b product impression statistics among EMEA. Executed data-driven marketing strategies for Google's retail focused products.

Research Experience

Medical Image Classification via CNNs | *Advisors: Dr Jun Kong* — August 2022 - Present
- Conducting classification of multi label large resolution chest x-ray images based on metastasis time with Convolutional Neural Networks and Self Supervised Networks.

Collision Prediction via Machine Learning | *Advisors: Drs Yigit C. Altan & Emre Otay* — Sept. 2020 - Present
- Developed a hypothesis and led the research from idea to publication. Implemented ensemble learning based classification algorithms to predict potential maritime accidents in narrow and congested waterways via non-distance related variables.
- Structured a database for 100 GBs of AIS data. Created a novel clustering based ensemble method to overcome imbalance. Achieved 80% recall score to detect potential accidents between vessels with minimized false positives.
- Purpose: Real time application to increase safety of standard and autonomous vessels and environmental habitat near congested waterways.
- Results suggest: 4 out of 5 risky encounters are predictable and can be prevented with early alert mechanisms. Tech: Python, MSSQL, imbalanced-learn

Cybercrime Vulnerability Modeling | *Advisor: David Maimon* — January 2021 – August 2021
- Using a specialized app, mobile phone activity of 200 individuals are collected in 1 year time frame to model their vulnerability for cybercrime. Raw dataset is structured to a relational model through ETL process.
- Using personality traits and mobile phone activity, sample is mapped through statistical tests and extensive visualizations. Explored patterns are presented in the published research report. Tech: QlikSense, Azure, SQL

Machine Learning Projects

Building Segmentation Through Satellite Imagery using CNNs May 2022

- Using U-Net and MobilNetV2 architectures, segmenting buildings for the purpose of residential development tracking.

Performance Improvement on Imbalanced Datasets Using Ensemble Methods December 2021

- Imbalance data focused methodologies are implemented and compared. A novel method to create imbalanced datasets are presented.

NFT Price Prediction via CNNs December 2020

- Using visual feature extraction, prices of Non-Fungible-Tokens (NFTs) are predicted. AlexNet and ResNet are implemented.

Pure Python (Non-Library, From Scratch) Machine Learning Algorithms December 2020

- Maximum Likelihood Estimator, KNN, Multi Layer Perceptron, Deep Encoder & Decoder (CNN) with Pytorch.

Churn Prediction for a Private Bank March 2021

- Executed a feature engineering process. Created a churn prediction model with ensemble algorithms on Python. Achieved 90% AUC score on an imbalanced dataset (90% - 10%). Presented the benchmark solutions and explained key separations based on decision tree outcomes to non-technical stakeholders.

Publications

M.F. Oruc, Y.C. Altan, "Prediction of Risky Maritime Encounters via Ensemble Machine Learning", *Proceedings of the 6th International Conference on Maritime Technology and Engineering (MARTECH 2022)*

Conference Presentations

Global Maritime Conference: "Risky Maritime Encounter Patterns in the Strait of Istanbul", Nov. 2021)

Hands on Technical Skills

Languages: Python, R, SQL, C, MATLAB, SAS
Frameworks: PyTorch, Tensorflow, Pandas, Numpy, Scikit-learn, Scipy, Seaborn, stata, mass, tidyverse, ggplot2, mlr3, caret, purr, knitr
Platforms: GCP, Weights & Biases, Apache Spark, Hadoop, Databricks, QGIS, Tableau
Algorithms: Ensemble Learning (Bagging & Boosting: R.F., SMOTE, RusBoost), Convolutional Neural Networks (CNNs) (Transfer learning), LSTMs, Logistic Regression, Linear Regression, Causal Inference, Clustering based Ensemble (Combining unsupervised and supervised methods)
Applications: Satellite Intelligence Modeling, Image Processing & Computer Vision, Recommendation Systems, Product Marketing Analytics, Churn Prediction, Anomaly Detection, Time Series Analysis

Scholarships & Honors

- Georgia State University Department of Mathematics and Statistics, Full Tuition Waiver (47.000 USD/year) (December 2020 - Present)
- Turkish Academy of Science Award, 2nd Best Bachelor's Graduation Capstone Project, Nationwide (1.000 USD) (June 2019)

Volunteer Experience

Fellow & Alumni at Turkish Entrepreneurship Foundation Istanbul, Turkey
Conducted trainings for underrepresented young students about science & research. *August 2017 - Present*

Innovation Fellow, Isbank Istanbul, Turkey
Designed an online & localized entrepreneurship bootcamp to help resource lacking founders. *Jan 2019 - July 2020*