# M.Furkan Oruc

Email: moruc1@student.gsu.edu ⎘

Linkedin: https://www.linkedin.com/in/m-furkan-oruc/ ⎘

Mobile:  +16789352925

Github:   https://github.com/furkanoruc ⎘

Atlanta, GA

Google Scholar ⎘

## SUMMARY

Driven applied researcher with depth in Machine Learning, Computer Vision and Maritime Analytics.

## 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, Object Oriented Programming (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

*Research Intern, Skylight*  *June 2022 – Present*

- Prototyping a machine learning model to forecast global fishing hot spots based on geospatial time series satellite environmental data. Cross functional collaboration with product, development and research teams.
- End to end responsibility to state hypothesis, collect data and build the model.

### 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

**Collision Prediction via Machine Learning** | *Advisors: Yigit C. Altan & Emre Otay*   September 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. Tech: Python, MSSQL, imbalanced-learn
- Results suggest: 4 out of 5 risky encounters are predictable and can be prevented with early alert mechanisms.

**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** ⧉     December 2020
- 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, stata, mass, tidyverse, ggplot2, mlr3, caret, purr, knitr
**Platforms**: GCP, Weights & Biases, Apache Spark, Hadoop, Databricks, QGIS
**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*