



# M.Furkan Oruc

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Atlanta, GA

## EDUCATION

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### Georgia State University

Atlanta, GA, U.S.A.

*M.Sc. in Statistics with Computer Science, GPA: 4.02/4.00*

*December 2020 - December 2022 (Expected)*

*Courses: Digital Image Processing, Database Systems, Applied Multivariate Statistics, Linear Statistical Analysis, Applied*

*Bayesian Statistics, Computer Vision (in progress), Deep Learning (in progress), Applied Stochastic Processes (in progress)*

### Ozyegin University

Istanbul, Turkey

*M.Sc. in Civil Engineering (Concentration: M.L. in Maritime Traffic)*

*September 2020 - May 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*

*September 2014 - September 2019*

*Courses: Applied Stochastic Modeling, Systems Engineering, Investment Management, Risk & Decision Analysis*

### The University of Queensland

Brisbane, Australia

*Study Abroad (Non-Degree)*

*January 2018 - July 2018*

## RESEARCH EXPERIENCE

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### Maritime Safety for Autonomous Ships | 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 unique methodology to combine clustering and classification methods 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
- In progress: CNN Model to map risk in narrow waterways based on vessels' respective positions using satellite imagery.

### Cybercrime Vulnerability Modeling | Advisor: David Maimon

January 2021 - Present

- 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

## INDUSTRY EXPERIENCE

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### Google





*Data Analyst*

*January 2020 - December 2020*

- Leveraged Google Search, Youtube and Trends data to provide weekly insights to customers and EMEA partners about rapidly changing trends during Covid-19 via a comprehensive business sense. Applied statistical models to test hypotheses. Communicated results to non-technical stakeholders. Reached 30,000 Small Businesses weekly for 5 months.
- Designated plan to distribute 1M USD Fund via data based strategy: Performed data wrangling and linear modeling for EMEA long tail market (+30k Businesses) and contributed to an end to end e-commerce digitization strategy, led the project with external and internal stakeholders.
- Implemented and executed data-driven marketing strategies for Google's retail focused products in Turkey, and led local product launches such as Grow My Store and Rising Retail Categories. Achieved highest b2b product impression statistics among EMEA.

## MACHINE LEARNING PROJECTS

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- 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.

## FORTHCOMING PUBLICATIONS

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- M.F. Oruc, Y.C. Altan, "Predicting the Risky Encounters without Distance Knowledge Between the Ships via Machine Learning", *Ocean Engineering's Special Issue on Autonomous Ships (Elsevier)*(Under Review, 2022)
- M.F. Oruc, Y.C. Altan, "Risky Maritime Encounter Patterns", *Applied Ocean Research* (Under Review, 2022)
- 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)* (Under Review, 2022)

## CONFERENCE PRESENTATIONS

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

## TECHNICAL SKILLS

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**Languages:** Python, R, SQL, C, MATLAB, SAS

**Frameworks:** Scikit, Scipy, PyTorch, Pandas, Numpy, stata, mass, tidyverse, ggplot2, mlr3, caret, purr, knitr

**Platforms:** Apache Spark, Hadoop, Databricks

**Algorithms:** Ensemble Learning (Bagging & Boosting: R.F., SMOTE, RusBoost), Convolutional Neural Networks (CNNs) (NFT Image Analysis, Deep Encoder & Decoder), Random Forest, Logistic Regression, Linear Regression, Naïve Bayes, Causal Inference, Time Series Analysis

**Applications:** Satellite Intelligence Modeling, Product Marketing Analytics, Churn Prediction, Anomaly Detection

## SCHOLARSHIPS & HONORS

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- 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

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- 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 - Present