

Education

University of Zurich, Zurich, Switzerland

M.Sc. in Computer Science

Sep. 2020 – Oct. 2023

Major: Data Science

Minor: Banking and Finance

GPA: 5.2/6.0

Major GPA: 5.4/6.0

Bilkent University, Ankara, Turkey

B.Sc. in Electrical and Electronics Engineering

Sep. 2016 – Jun. 2020

GPA: 3.03/4.0

TED Ankara College, Ankara, Turkey

High-School

Sep. 2012 – Jun. 2016

Research Experience

ETH Zurich - Social Networks Lab, Zurich, Switzerland

Research Assistant

Jun. 2022 – Jul. 2023

Supervisor: *Prof. Dr. Ulrik Brandes*

- Employed spatio-temporal tracking data obtained from UEFA to generate automatic formation detection and role assignment algorithms.
- Used the same dataset to cluster passing patterns of players and teams by building spatial networks.

Teaching Experience

ETH Zurich - Soccer Analytics, Zurich, Switzerland

Teaching Assistant

Spring 2023

Lecturer: *Prof. Dr. Ulrik Brandes*

Industry Experience

Union of European Football Association (UEFA), Remote

Data Science Intern

Oct. 2023 – Jan. 2024

- **Intelligence Center:** Leading the integration of online data repositories for strategic off-pitch football research, incorporating statistical and machine learning analysis to study player workload.
- **Football Team:** Implemented football metrics utilizing tracking and event data sourced from UEFA, covering ball location, press classification, progression classification, pass classification, running total of ball out of play, and running total of effective time.

Kardinero Medical Systems, Ankara, Turkey

Embedded Systems Intern

Jun. 2019 – Jul. 2019

- Utilized NUCLEOF412ZG board with STM32 Cube IDE to communicate via Serial Peripheral Interface protocol.
- Employed STEVAL-MKI178V2 chip to obtain gyroscope and accelerometer data, which communicates with the NUCLEOF412ZG board via SPI protocol.

FNSS Defence Systems, Ankara, Turkey

Embedded Systems Intern

Jun. 2018 – Jul. 2018

- Used NUCLEOL476RG board with STM32 Cube IDE to communicate via Controller Area Network protocol.

Publications

How to Read a Team's Spatial Expressions

U. Brandes, H. Sotudeh, D. Parlak, P. Laffranchi, Mert Erkul

Under submission, MIT Sloan Sports Analytics Conference 2023

Significant Academic Projects

An Open-Source Implementation of FIFA's Enhanced Football Intelligence, University of Zurich, ETH Zurich

Master's Thesis

Spring 2023

Supervisor: *Prof. Dr. Claudio J. Tessone*, Co-Supervisor: *Prof. Dr. Ulrik Brandes*

- Were the concepts in the Enhanced Football Intelligence document sufficiently detailed to allow for reproduction of FIFA's match reports?
- The goal of the thesis was to provide an open-source implementation of the concepts in the Enhanced Football Intelligence document and validate it using FIFA World Cup 2022 data. Where necessary, ambiguities were resolved, alternatives were tested, and potential improvements were included.

UniFi: A Unified Framework for Portfolio Management, University of Zurich

Master's Research Project

Spring 2022

Supervisor: Prof. Dr. Manuel Günther

- Developed a framework to compare different portfolio allocation methodologies.
- In the financial environment layer, users could fetch or import their own data and apply feature engineering.
- In the model layer, users could use either a conventional model (Support Vector Regression, Random Forest, Decision Tree, Linear Regression, Huber Regression) or a reinforcement learning model (A2C, TD3, PPO, DDPG) as the portfolio allocation methodology.
- In the evaluation layer, users were able to apply back-testing and view the performance of the chosen methodology with preferred performance metrics.

Italy v Spain Match Analysis Euro 2020, ETH Zurich

Soccer Analytics

Fall 2022

Supervisor: Prof. Dr. Ulrik Brandes

- Analyzed the EURO 2020 semi-final match between Italy and Spain.
- Examined analysis techniques regarding players' movement, passing, shooting, in-game and end-of-game match probabilities, set-pieces, player valuations, and ratings.
- Generated a match report using event data obtained from Statsbomb and tracking data provided by UEFA.

Cryptocurrency Price Direction Prediction, University of Zurich

Finance and Machine Learning

Fall 2021

Supervisor: Dr. Mario Sikic

- Conducted a binary classification task to predict the direction of close prices of cryptocurrencies (ADA, BTC, DOGE, ETH, and LTC) utilizing high-level frequency (minute level) data.
- Performed feature engineering to handcraft the most prevalent technical features used in technical analysis. Utilized model-dependent and model-agnostic feature selection methods to select the most informative and relevant features.
- Built a Decision Tree model as a baseline and aimed to improve the prediction accuracy in varying time horizons using Support Vector Machine, Logistic Regression, Artificial Neural Network, Recurrent Neural Network, and Random Forest models.

BeeSMART, Bilkent University

Bachelors Graduation Project

Spring 2020

Supervisor: Prof. Dr. Ezhan Karasan

- Developed a project with embedded components consisting of GSM, GPS, microphone, weight, and temperature sensors to monitor the smart hive in addition to Edge Learning.
- The main aim was to predict the internal conditions of the hive using bee sounds while simultaneously reporting the results to a cloud server to establish IoT communication over MQTT with Android and Web applications for the clients.

Skills

Software: Python, SQL, R, MATLAB, C, C++, Java, VHDL

Technologies: NumPy, Pandas, Scikit-Learn, SoccerAction, Mplsoccer, PyTorch, TensorFlow, Keras

Tools: Dataiku, VS Code, Jupyter Notebook, Git, XCode, Arduino

Languages

English

Level: Advanced

German

Level: A2

Turkish

Level: Native

Examinations

TOEFL iBT

Grade: 97/120

GRE General Test

Quantitative: Grade 168/170

Extracurricular

- Certificate of completion - Churchill House School of English Language Summer School
- Certificate of completion - Loyola Marymount University English Language Summer School
- Former licensed kickboxer
- Former licensed chess player