

Amod Sahasrabudhe

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EDUCATION

Northeastern University, Boston, MA

Jan. 2021 – Present

Khoury College of Computer Sciences

Expected Graduation: 2023

Candidate for a Master of Science in Artificial Intelligence

Related courses: Foundation of Artificial Intelligence, Algorithms, Programming Design

Paradigm, Unsupervised Machine Learning, Machine Learning

Savitribai Phule Pune University, Pune, India

Bachelor of Engineering in Information Technology

2016 – 2020

TECHNICAL KNOWLEDGE

Languages: Python, Java, HTML, CSS, Javascript, R

Databases: MySQL, Postgres

Libraries: Numpy, Pandas, Keras, TensorFlow, Matplotlib, Spektral, MPLSoccer

Cloud Technologies: AWS Sagemaker, AWS Redshift, S3

WORK EXPERIENCE

United States Soccer Federation

Artificial Intelligence Intern, Sporting Analytics

June 2022 – Dec 2022

- Using Postgres database to retrieve tracking data samples using a rule-based approach to identify counter attacks and using these rules to identify successful and unsuccessful instances.
- Converted the tracking data samples to a Graph format which contains node features and edge features and adjacency matrix.
- The node features represent the player/ball, edges represent the relationship amongst the players and the adjacency matrix represents the relationship amongst the nodes.
- Trained three separate Graph Neural Networks for women's, men's, and combined data – achieving a logloss score of 0.48, 0.51, 0.56 respectively and ROC-AUC metric of 0.83, 0.78, and 0.76 respectively.
- Achieved a well calibrated model with ECE values as 0.15 and 0.18 respectively for the women's model and men's model.
- GitHub repository link: https://github.com/USSoccerFederation/ussf_ssac_23_soccer_gnn

Villarreal C.F.

Data Science Intern (Volunteer)

May 2021 – Aug 2021

- Built an automated tool for generating reports consisting of visualizations that includes pass maps, heat maps for defensive actions, shot maps, and so on.
- Built and developed machine learning model for calculating Expected Goals (xG) using a combination of event data and tracking data. The Expected Goal model calculates the likelihood of a shot being scored given the shot location, speed, players blocking the shot, etc.
- The xG model was trained using Neural Networks on the historic data of all available shots in the Statsbomb database.

PROJECTS

Aerial Control model – an extension of the pitch control model

Dec 2021 – Feb 2022

- Building on top of the existing pitch control model (Spearman) framework, to determine the probability of a team winning possession of the ball, given the target location. The model uses a logistic regression approach in calculating the likelihood of the team gaining possession of the ball.
- Built a web-based interactive tool, to drag the players on the pitch, select a target location for the ball and input the angle with which the ball is launched. Based on the given input, the model predicts the likelihood of the team to gain or regain possession. (Tool link: <https://razor3598.github.io/Aerial-Control/main.html>)

Deep Q Learning for Autonomous Driving car using simulation environment

Aug 2019 – Apr 2020

- For a given input image of the street captured by the camera, which is installed at the front of the car, the Deep Q Network computes the Q values (rewards) corresponding to the actions available to the autonomous driving car. These actions are discrete angles through which the car can steer for constant speed. The autonomous driving system in the car enforces action that has the highest reward.
- The training dataset is obtained by manually collecting pictures for the drive while simultaneously recording the steering angle and throttle values.
- Deals with simulation results of an autonomous car learning to drive on a single-lane highway or a road with lane markings.