2022 School of EECMS Summer Internship Application Form

Main Supervisor	Dr Sajib Mistry
Other supervisors (if applicable)	
Name of proposed student intern	
Student ID of proposed intern	
Project Title	Proactive Live Soccer Analysis using Spatial Transformer Networks
Project Description	Uncertainty is an intrinsic feature in a live Soccer game. Teams continuously adapt to the situation in the game, apply new tactical formation, change roles of the players, substitute players, and so on. Due to this fluid nature, dynamic decision-making is mainly driven by human experts, e.g., coaches in the field. As the live game generates a lot of data in a very small period, effective analysis of dynamics in the game would provide valuable new insight and also enable human experts to deploy quick decisions to impact the game's outcome. We aim to investigate player-to-player interactions in place to direct the creation of a dynamic planning model capable of identifying and predicting the opponent team's tactics. Our proposed approach has a clear advantage in that we do not have to rely on historical data to analyze and produce our outcomes, allowing us to employ it in a live game. We will explore the various tactics of the opponent team by making use of an advanced adaptive machine learning approach, i.e., Deep Embedded Clustering and Spatial Transformer Networks. The performance matrices of the ML approaches are adaptability and explainability on answering the following key challenges: a) Detecting changes in the pattern of gameplay of the opponent. b) Clustering a similar pattern of gameplay to identify possible tactics implemented by the opponent. c) Recommending temporal tactical formations and potential substitutions based on players' live performances. The dataset to be used is the largest accessible database of soccer logs ever published, compiled by Wyscout and comprising all the spatio-temporal events (passes, goals, fouls, etc.). To the best of our knowledge, this will be the first live game automated substitution model. The outcome of the project is the first usage of adaptive ML approaches in tactics identification and substation recommendation using the live game data only. Useful links: https://www.kaggle.com/hugomathien/soccer https://www.kaggle.com/benhamner/random-forest-benchmark-r https://www.kaggle.com/efezinoerome/analyzing-soccer-data https://www.kaggle.com/agostontorok/soccer-world-cup-2018-winner