While smartphones and other mobile devices have gone through enormous innovation in recent years, they are still resource constraint due to their size and require to offload some of the computationally expensive tasks to Cloud Computing Servers. However, Cloud Servers are plagued by low latency and bandwidth, as they are generally located remotely, in relation to the user. Multi-Access Edge Computing (MEC) is a next generation Cloud Computing architecture that brings some of the power of a Centralised Cloud Server to the edge of the radio access network. As MEC servers are deployed at the edge of the radio access network they are capable of providing application service with low latency and high bandwidth as compared to traditional Centralized Cloud Servers. MEC servers are however also resource constraint when compared to a Centralized Cloud Server, and are capable of running only a finite number of services on a single edge server. Hence, large applications have to be decomposed and distributed onto different edge servers, using a dedicated service placement algorithm that optimizes the placement of services on different edge nodes.

However, MEC faces a critical challenge, due to the increasing mobility of users. This is because, placing of services at edge servers closer the current location of the user, can be made redundant by, due to the movement of the user. This leads to increased latency and results in a decrease in the Quality of Service. Hence, service placement algorithms need to consider the future movement of the user, before placing services on edge servers.

To address these challenges, two state of the art route prediction algorithms, that are based on Sequence to Sequence and Hidden Markov Models, are implemented in this dissertation. These algorithms are then integrated into an existing Service Placement Algorithm, to prioritize the placement of services at edge servers closer to the predicted trajectory of the user.

These route prediction models are evaluated on the accuracy of their prediction as well as the average distance of the prediction from the actual route. The performance of the route prediction algorithms are also compared, in the context of the service placement algorithm, by measuring the average network latency of the service, the average waiting time and the resource utilization of the edge servers.

The results of this study, confirm that route prediction algorithms do indeed improve the performance of service placement algorithms. Furthermore, the route prediction algorithms implemented in this dissertation outperform a baseline Cluster Based Hidden Markov Model, implemented in existing research.