# ABSTRACT

Reinforcement learning addresses the problem of how autonomous agent gathers information and performs action in its environment to achieve its goal. Q learning is a kind of reinforcement learning that can acquire optimal control strategies form delayed reward.

This thesis proposes a learning technique based on separating long-term goal to small subtasks, using function approximator to generalize the similar state and transferring knowledge between agents for reducing the exploration environment of Q learning. This technique will be simulated in soccer games. The environment in game is 3 dimensions, uncertainty environment and the agent will get only partial information from the sensor.

As a result, by using the technique, the autonomous agent will reduce time to explore the environment. However, subtasks were divided and they may or may not be the optimal subtasks.