Abstract
Aaron Duggan - 16325955
There has been a strong uptake in research into deep reinforcement learning (DRL) in the past few years as it was discovered that issues of high dimensionality in reinforcement learning (RL) could be overcome with deep learning methods. The primary focus of this research has been on single-objective DRL methods, placing a need for research into multi-objective DRL (MODRL) methods. This dissertation analyses the current state of the art multi-objective reinforcement learning (MORL) and MODRL methods. The design of a new MODRL algorithm called Deep W-Learning, based on the MORL algorithm W-Learning, is presented. Details of an implementation of Deep W-Learning are discussed. This implementation is evaluated using two state of the art MORL benchmark environments. Through analysis of the evaluation Deep W-Learning is considered a potential state of the art MODRL algorithm.