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Evolution and machine learning in robotics

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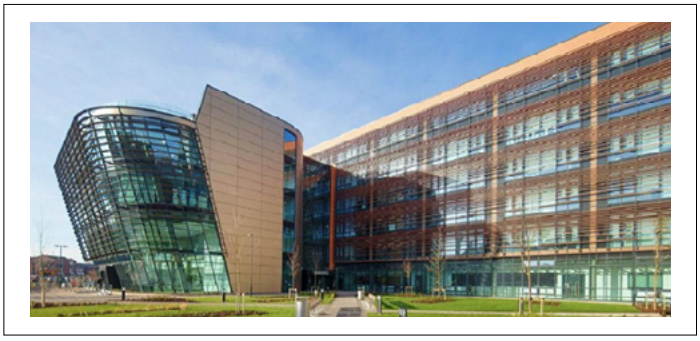
Abstract

At the heart of a robot is a policy which tells it what to do (i.e. which action to take) in any given situation. This can be a collection of simple rules or a complex mathematical function. But how do you know what the rules or mathematical function should look like? Fortunately, there are machine learning algorithms to approximate the function (e.g. kernel machines, deep learning, etc) or automatically infer these rules (e.g. inductive logic programming, random forests, etc). However, supervised learning algorithms require a lot of training data which may not be available. Evolutionary methods (e.g. genetic algorithms) and other optimization algorithms do not require any training data to evaluate and search through a policy-space and find the optimal rules or function. Alternatively, by directly equating the policy to a search (through a state/action-state space) as is done in reinforcement learning, the next best action can be found using a learned evaluation function (e.g. V or Q-function).

Biography

Mohammed Terry Jack is a Research Engineer at Wluper, UK. His research interests are electrical and Electronic Engineering, Artificial Intelligent Systems and Artificial Intelligence Nano degree. He is facilitated with the best student award, dissertation award.



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