# Using Evolutionary Algorithms to Enrich Q-Learning Reward Functions

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*Abstract*—This is a test abstract for Assignment 1 of CSCI 7090.
`https://github.com/bmillerdev/`
`DS_ML_Project_colab-integration`
*Index Terms*—component, formatting, style, styling, insert

## I. Introduction

One of the main areas of tribal knowledge that drive successful data science practice is the selection of proper parameters and hyperparameters such as learning rate or epoch size.

## II. Problem Areas of Choice

To test the efficacy of this approach, we must choose a wide variety of problem areas such that there would be no reason the hyper-parameters ought to be the same.

## III. Experimentation

To enable experimentation, we created a runtime environment within code that had access to a number of different simulation environments provided by OAI Gymnasium.

### A. Training Phase

During this phase, each trait was hydrated with a randomly chosen weight associated with the goals of a particular problem. These weights were used to inform the reward function within the Q-learner.

### B. Testing Phase

Following training, the weight preferences produced by the evolutionary algorithm were employed, and its performance within the Q-learner was assessed after 1000 successful epochs within the Learner.