Dissertation

Cesar Esparza

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Abstract

The objective of this work is to describe in detail how a python library is built. The main purpose of this library will be to solve normal form games through an algorithm known as genetic algorithm (...) . In order to have a better understanding of how the library was built, it is considered important to give some theoretical background of game theory and evolutionary game theory.
Within this written work, it will be explained how evolutionary game theory works, application of the genetic algorithm, what considerations were made for building this specific genetic algorithm, etc.

1 Game Theory and normal form games

If necessary some background of game theory

1.1 Nash Equilibrium

Nash

1.2 Evolutionary game theory

1.2.1 Natural Selection

- Fit of form and function
- Diversity of life
- Procession of life
- Distribution and abundance of organisms

Darwin's postulates (...)

1.2.2 How we use it

Evolution can be thought as a game. According to the *theory of evolution* the existing organisms are the result of many different selections, in which the ancestors resulted the most fitted. These selections were the result of the interaction between the organisms of the same and other species. I dare to say that most of the times it reduces to hunters and preys. Where the best hunter survives and the best prey survives. But what does this imply? how can one be a good hunter? even more how can one be a good prey?. Different organisms posses different attributes, which determine to what part of the chain they belong. But competition for survival is not only seen between different organisms, it is also seen within the same species. Within same species there are important considerations one of the most important being the capability to reproduce.

For the purpose of this work, we will be focusing on the interaction between the same species. The model we will use is simplified.

2 Python and genetic algorithm(relating evolutionary game theory)