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Taming Nature Inspired Evolutionary Optimisation Algorithms

Abstract

Can a computer automatically design a car, a boat or an aircraft? This is a driving question at the heart of design optimisation. Increasingly researchers are looking towards nature for inspiration to achieve this goal, making a computer evolve a car instead of designing it.

By its nature evolution is hard to control, which causes some problems when trying to use it to do a specific task. What seems like a simple solution to a complex problem can quickly become difficult to use. The inherent randomness means you can never be completely certain you'll get a good design quickly enough. This has led to complex adaptive algorithms which try to control mutation and survival rates from generation to generation to get the best design in the shortest time.

In this talk I will give a brief overview of evolutionary optimisation algorithms, discuss the problems with them and suggest some potential solutions.