

The horrendous story of why optimal is not best

From the ivory tower of mathematics, optimal is the goal to reach when solving any problem, although it usually is not the best solution for those same problems in the real world.

As an example of this statement evolutionary algorithms are going to be explained. A traditional field of computer science, optimization problems, has now become mainstream and started to be studied from a lot of new points of view, one of those are evolutionary algorithms.

The optimal solution to solve a problem through evolution from the mathematical point of view consist of three actions taken over individuals. Individuals consists of elements with characteristics that determine how they behave in the environment. Their goal is to reach the previously unknown status in the environment which is optimal, the one which is the absolute maximum in the function that represents the environment.

The first action to perform over the individuals is to mix their characteristics in order to generate new and different ones. The next step will be to rate their new position in the environment, and the last one is to discard those whose position is under average.

This method reflects a perfect example of an optimal solution to a problem regarding the mathematical point of view whereas when applied to the real world it becomes a strictly horrendous solution which means that by far optimal is not best.