Out of the Box Optimization Using the Parameter-less Population Pyramid

By: Brian Goldman

When: July 1st from 1:00p-3:00p

Where: 1455A BPS, BEACON Seminar Room

Abstract:

The Parameter-less Population Pyramid (P3) is a novel method for performing optimization without requiring any user configuration. P3’s primary innovation is to replace the generational model, common in generic optimization tools, with a pyramid of multiple populations that are iteratively created and expanded. In combination with local search and advanced crossover, P3 scales to problem difficulty, exploiting previously learned information before performing more stochastic exploration.

Using extensive experimentation and algorithm analysis we find that P3 requires fewer evaluations to find the global optimum and achieves better fitness when using the same number of evaluations than existing methods. Unlike the best comparison algorithms, P3 was able to achieve this quality without any problem specific configuration. We therefore conclude that P3 is an efficient, general, parameter-less approach to optimization that is more effective than existing state-of-the-art techniques.