Unconventional Optimizer Development

David Corne

School of MACS, Heriot-Watt University
Edinburgh EH14 4AS, UK

The fruits of bio-inspired approaches to optimisation include several techniques that are now commonly used in practice to address real-world problems. A common situation is as follows: an organisation has a regularly occurring problem to solve (typically a logistics problem), and they engage a research group or a consultancy to deliver an optimizer that can then be used as they regularly solve instances of that problem. The research group will then spend perhaps several months developing the optimizer, and this will almost always involve:

(i) deciding to use a specific algorithm framework (e.g. tabu search or evolutionary search);
(ii) tuning an algorithm over many problem instances in the space of interest, towards getting the best results achievable in a given time (perhaps minutes).

I argue that this typical approach should, in many, arguably most cases, be changed completely. First, the client does not need a slow algorithm that delivers great solutions - they need a very fast algorithm that delivers acceptable solutions. Second, there are many drawbacks and uncertainties in the enterprise of algorithm tuning; it would be good to mitigate these uncertainties via a different approach. Third, to spend several months designing and tuning an algorithm that solves instances seems like a great waste of time when, in several cases, it may be possible to simply use this time to solve all of the instances the company is likely to face! In this talk I therefore discuss the ingredients of the unconventional approach.

C.S. Calude et al. (Eds.): UC 2011, LNCS 6714, p. 9, 2011.