Recent Developments in Nature-Inspired Algorithms for Optimisation: the Case of the Plant Propagation Algorithm

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The class of Nature-Inspired Algorithms (NIAs) has expanded tremendously in the last few years. There is a good reason for that: they are powerful l tools that work on the most difficult problems often with no assumptions, unlike traditional gradient-based approaches. They are also easy to understand and implement. Their attraction, therefore, is obvious. The downside of this growth is that such algorithms keep on coming and often, little attention is paid to previous related work, leading to similarities and overlaps which contribute to the confusion of the novice and particularly the potential user with little expertise in the domain and in OR as a discipline.

The Plant Propagation Algorithm or PPA, also known as the Strawberry Algorithm, has been introduced by Salhi and Fraga in 2010. Initially it has been applied to continuous global optimisation. However, it has since been extended to discrete global optimisation with or without constraints and to multi-objective optimisation. Moreover, some theoretical work on the conditions under which it converges has also been carried out.

In this talk, I will review the most prominent NIAs and highlight the mistakes and traps to avoid when designing such algorithms. I will provide situations where there is indeed overlap and repetition. But, I will concentrate on PPA as a potent tool for a variety of problem classes in optimisation. Variants of it will be presented and computational results will be provided.