Plenary Talk

How Can Metaheuristics Help Software Engineers

Enrique Alba
Professor of Software Engineering
Director, MS Software Engineering
Associate Chair of Graduate Studies, CS Department
George Mason University
USA

Abstract

This presentation focuses on the potential benefits that metaheuristics (Genetic Algorithms, Ant Colonies, Particle Swarm, etc.) can bring to the field of Software Engineering (SE). For this to happen, we first need that a proper model of the SE problem is done in the form of an optimization, search or learning task. This is actually quite often the case in SE and other domains, thus allowing the utilization of powerful tools that can solve open problems in software testing, staff management for software projects, automatic tuning of communication protocols, model checking, next release problems, and a big amount of new challenges that can be now investigated thanks to the cross fertilization between these two domains. The talk will raise the main open questions in this new field as well as discuss on best practices, characterization, theory, and actual application of advanced search algorithms for software engineering.

About the Speaker

Prof. Enrique Alba had his degree in engineering and PhD in Computer Science in 1992 and 1999, respectively, by the University of Málaga (Spain). He works as a Full Professor in this university with varied teaching duties: data communications, distributed programing, software quality, and also evolutionary algorithms, bases for R+D+i and smart cities, both at graduate and master/doctoral programs. Prof. Alba leads an international team of researchers in the field of complex optimization/learning with applications in smart cities, bioinformatics, software engineering, telecoms, and others. In addition to the organization of international events (ACM GECCO, IEEE IPDPS-NIDISC, IEEE MSWiM, IEEE DS-RT, smart-CT…) Prof. Alba has offered dozens postgraduate courses, more than 70 seminars in international institutions, and has directed many research projects (9 with national funds, 7 in Europe, and numerous bilateral actions). Also, Prof. Alba has directed 12 projects for innovation in companies (OPTIMI, Tartessos, ACERINOX, ARELANCE, TUO, INDRA, AOP, VATIA, EMERGIA, SECMOTIC, ArcelorMittal, ACTECO, CETEM, EUROSOTERRADOS) and has worked as invited professor at INRIA, Luxembourg, Ostrava, Japan, Argentina, Cuba, Uruguay, and Mexico. He is editor in several international journals and book series of Springer-Verlag and Wiley, as well as he often reviews articles for more than 30 impact journals. He is included in the list of most prolific DBLP authors, and has published 130 articles in journals indexed by ISI, 11 books, and hundreds of communications to scientific conferences. He is included in the top ten most relevant researchers in Informatics in Spain (fifth position in ISI), and is the most influent researcher of UMA in engineering (webometrics), with 14 awards to his professional activities. Pr. Alba's H index is 62, with more than 18,000 cites to his work.