

Book Review

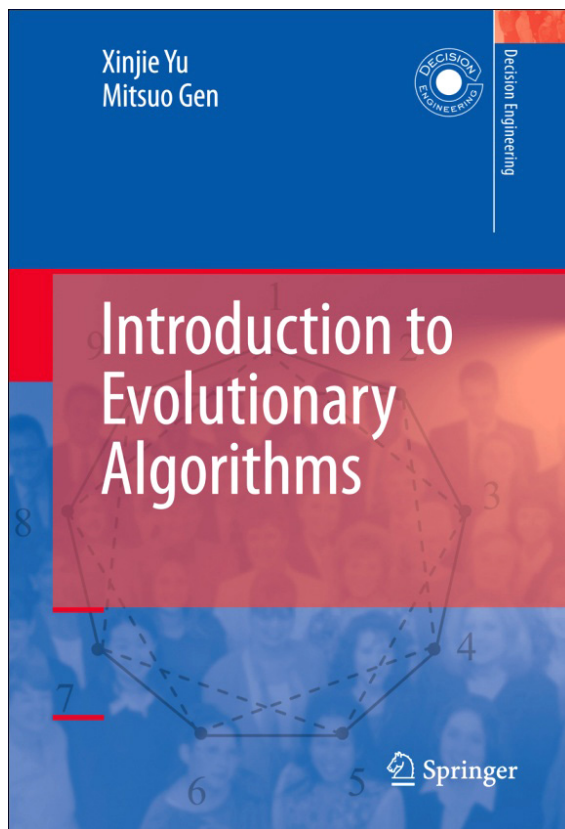
Introduction to Evolutionary Algorithms

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There are various complex optimization problems in engineering, economics, biological and sociological areas in a real-world application. These problems usually cannot be solved by general well-structured optimization methods such as function extreme methods and/or mathematical programming. In the recent years, a series of optimization techniques inspired by biological systems have been developed. Most of them can be referred as the term of “Evolutionary Algorithms” (EA). The author of the reviewed book *Introduction to Evolutionary Algorithms* gave the definition of EA as population-based, fitness-oriented, and variation-driven algorithms performing optimizing or learning tasks with the property of evolving. Evolutionary algorithms have strongly adaptive search ability by mimicking the evolution process of biological system. They can usually find the best solution for most complex or ill-structured problems. The solutions maybe are not the theoretical or global optimum, but they are extremely satisfactory to the practical applications, generally. Therefore, evolutionary computation has become the most popular optimization tools to researchers and engineers. Naturally, Evolutionary Computation, Evolutionary Algorithms or called as Intelligent Computation have become a very popular course in many universities.

Unfortunately, there is no a good textbook for this course which includes various evolutionary algorithms, although some books for Genetic Algorithms, Ant Colony Optimization or Particle

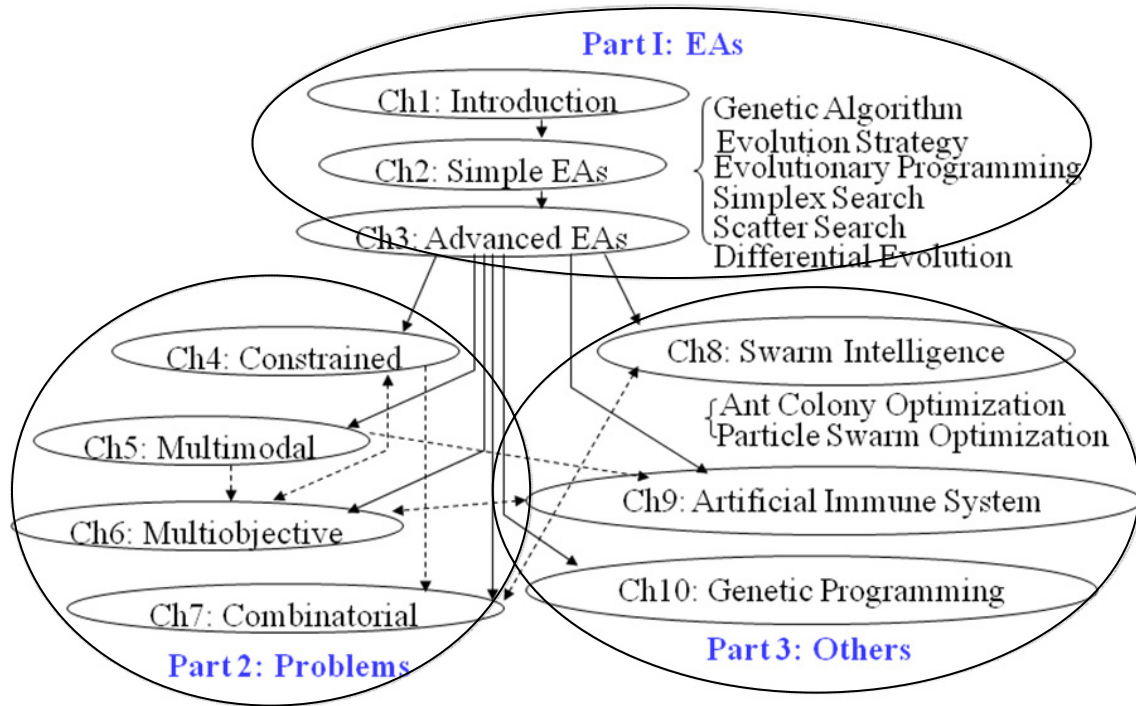
Swam Optimization had been published. I had taught this course about ten years. I and my students do really desire a useful textbook for our course on Evolutionary Computation. The recently published textbook contributed by Professor X. Yu and Professor M. Gen just meets our demand. I believe that it is also the demand of many readers.

I know the authors for many years. They both teach Evolutionary Computation and Applications in universities for long time. Therefore, they deeply know what are students needed and interested, and what are easy to students for understanding. Moreover, they both are the active researchers on this and relative areas for long time. More than hundred of papers and several books on Evolutionary Algorithms authored by them have been published in academic journals or by famous publishers. Certainly, they know the attractive research topics and hot problems in this area. Therefore, I think they are the most qualified scholars to write the textbook.

The textbook is well-organized. It begins with the foundational concepts and key elements of simple algorithms. Then, it leads students step by step to study advanced search techniques, current achieved results and various successful applications. It has no intention to pursue the theoretical perfection and theorem proofs, but it explains the basic ideas and main computational procedures in simple terms. It provides an easy and efficient way for students to deeply understand

the foundation of Evolutionary Computation. The book emphasizes the initiative ideas of the algorithm, contains discussions in the contexts, and suggests further readings and possible research projects. All the methods form a pedagogical way to make EAs easy and interesting.

The textbook also includes some updated evolutionary techniques such as the emerging variants of Ant Colony Algorithm and Particle Swarm Optimization. They may directly lead students to the research fronts of this area. The road-map of the map could be illustrated as follows:



Generally, I do appreciate the authors and the publication of the book. I do feel that the textbook will be helpful to the students and researchers who are interested in study and applications of evolutionary algorithms.

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