Evolutionary Computation
Vol 1: Basic Algorithms and Operators
Vol 2: Advanced Algorithms and Operators
Edited by T. Bäck, D. B. Fogel and T. Michalewicz
Institute of Physics Publishing, 2000.

The biological mechanisms of evolution are well known: mutation, genes, selection, and so forth. You are only reading this because your ancestors were pretty good at surviving, and therefore had offspring. In fact, you owe your brain to evolution. What is not so well known is that evolution can be simulated on computers, and important problems can be solved by using evolutionary methods. Evolutionary computation includes genetic programming, evolutionary programming, and even artificial life, which uses the ideas to explore and extend biology.

Applications of evolutionary computing range from solving business problems, through problems in science and practical engineering, to artistic creation. Because evolutionary computation is remarkably effective and moreover works very well in areas that would defeat conventional approaches, it ought to be part of every professional computer scientist's toolkit.

Based on an earlier and more expensive single volume reference book on evolutionary computation, these two volumes are a taut and authoritative reference manual for programmers and researchers. Volume 1 should be required background reading for any undergraduate project or course in evolutionary computing; the second volume is more advanced, and would be required reading for specialist courses or for researchers. The coverage and balance of the two volumes is impressive, and the field is very lucky to have such a broad and well-referenced classic: all chapters have excellent references, and many have further reading lists. The forty one contributors are well-known authorities and active participants in the field.

There is a helpful glossary, repeated in both volumes, but newcomers to evolutionary computation will regret the occasional lapse into biological jargon, and the absence of a review of internet resources or of program code that can be typed up and will work directly These are rather academic reference books, and certainly won't suit readers who wish to get into the subject without appreciating mathematics! Real newcomers are recommended to get the book two of the same editors wrote: Michalewicz & Fogel's excellent *How to Solve It: Modern Heuristics* (Springer, 2000) as a wider-ranging and easier-going introduction to the field. But for anyone who is a specialist or wants to hold their own as a specialist in evolutionary computation, these two volumes are an essential and up to date reference.