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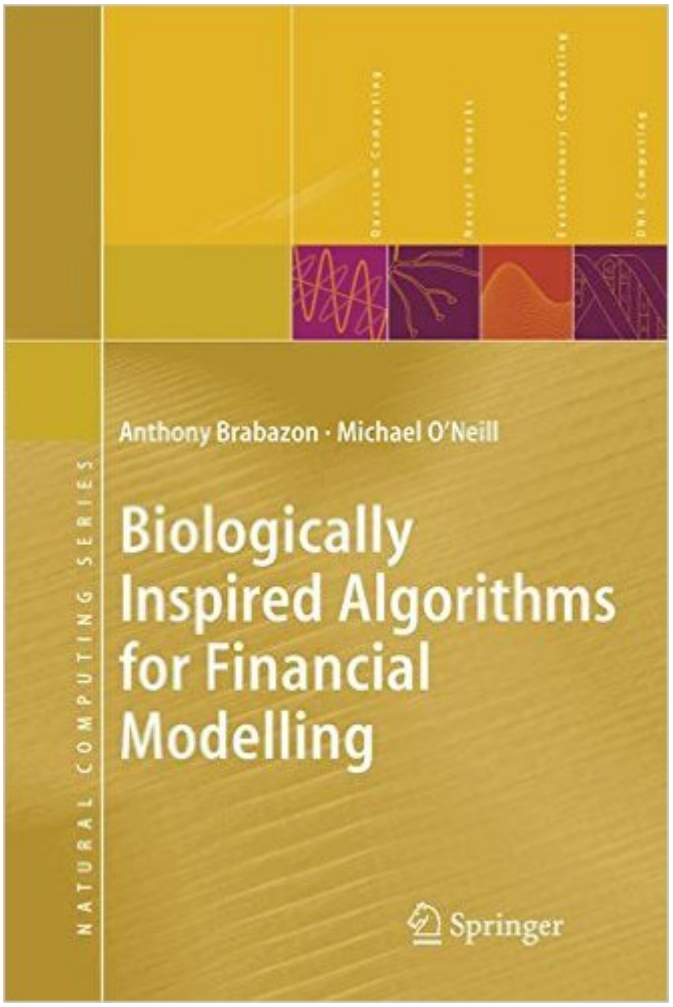
Biologically Inspired Algorithms For Financial Modelling (Natural Computing Series)



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Synopsis

Predicting the future for financial gain is a difficult, sometimes profitable activity. The focus of this book is the application of biologically inspired algorithms (BIAs) to financial modelling. In a detailed introduction, the authors explain computer trading on financial markets and the difficulties faced in financial market modelling. Then Part I provides a thorough guide to the various bioinspired methodologies â “ neural networks, evolutionary computing (particularly genetic algorithms and grammatical evolution), particle swarm and ant colony optimization, and immune systems. Part II brings the reader through the development of market trading systems. Finally, Part III examines real-world case studies where BIA methodologies are employed to construct trading systems in equity and foreign exchange markets, and for the prediction of corporate bond ratings and corporate failures. The book was written for those in the finance community who want to apply BIAs in financial modelling, and for computer scientists who want an introduction to this growing application domain.

Book Information

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Customer Reviews

"Biologically inspired optimization algorithms with financial applications" would be a better title. Apart from the models embedded in the algorithms themselves, the models on hand are statistical - regression and classification - used to predict stock prices and corporate defaults.The first problem is initially handled with multilayer perceptrons: having settled on a specific network structure, one

employs backpropagation to search for optimal network weights, effectively coefficients in a non-linear regression. Next, one makes the network structure part of the optimization problem: a genetic algorithm (GA) experiments with different configurations (and starting weights), while backpropagation continues to tune coefficients for each profile. A distinct approach employs GA alone, developing it into genetic programming (GP), which performs a "smart" search over sequences of operator/value strings, forming transformation-defining expressions.Genetic programming accounts for a third of Part I and 6 out of 10 case studies in Part III. It seems fair to judge the book by how well it covers its central topic. It fails. Things get difficult to follow just as GP is introduced on p. 54: a "syntax tree" is shown without any explanation - then again, the section on radial-basis-function networks never said what a radial-basis function is - and the plausible question about how GA can handle the valid-syntax constraint is unanswered. Details pile on, onto a foundation that’s not there. Implementation remains unclear, and if a book about GP does not tell you how to build GP, what good is it?Subpar writing is found elsewhere in Part I, especially in the sections on radial-basis-function networks and ant-colony optimization (ACO).

Although this is a good book on using bio-inspired algorithms for financial modelling, I cannot give it five stars for a simple reason: Its price currently being somewhere around 90$ is way over the top for a book containing only 275 pages. (Even the Kindle-edition of the book is approaching 90$.) The books content is just not worth that much. Compare it for instance to Barry Johnson’s highly recommendable book "Algorithmic Trading and DMA: An introduction to direct access trading strategies", consisting of nearly 600 pages (though paperback only), having a price of around 40$ - 50$. Or Stephen Marsland’s book "Machine Learning: An Algorithmic Perspective (Chapman & Hall/Crc Machine Learning & Pattern Recognition)" (406 pages) at a price of roughly 60$ - 70$.Anyway, let’s discuss the books contents. The book is well written and clearly structured, so it’s fun to read it. It basically consists of three parts: The first part explains the theories and introduces several bio-inspired algorithms and how they work. The second part covers implementation details and gives hints about typical implementation problems you’ll run into. It also gives you a really brief introduction to technical analysis. And the third part contains case studies where for most algorithm types one implementation example is given.Algorithms covered by the book are 1. neural networks, 2. genetic algorithms, 3. grammatical evolution, 4. particle swarm models, 5.

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