

Advanced Textbooks in Mathematics

# AN INTRODUCTION TO MACHINE LEARNING IN QUANTITATIVE FINANCE

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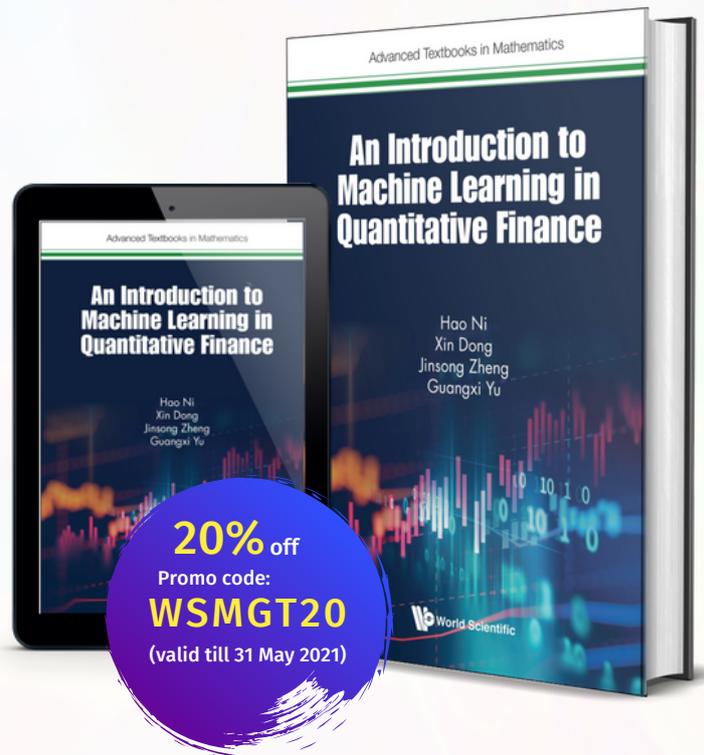
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In today's world, we are increasingly exposed to the words "machine learning" (ML), a term which sounds like a panacea designed to cure all problems ranging from image recognition to machine language translation. Over the past few years, ML has gradually permeated the financial sector, reshaping the landscape of quantitative finance as we know it.

*An Introduction to Machine Learning in Quantitative Finance* aims to demystify ML by uncovering its underlying mathematics and showing how to apply ML methods to real-world financial data. In this book the authors

- Provide a systematic and rigorous introduction to supervised, unsupervised and reinforcement learning by establishing essential definitions and theorems.
- Dive into various types of neural networks, including artificial nets, convolutional nets, recurrent nets and recurrent reinforcement learning.
- Summarize key contents of each section in the tables as a cheat sheet.
- Include ample examples of financial applications.
- Showcase how to tackle an exemplar ML project on financial data end-to-end.
- Provide a GitHub repository <https://github.com/deepintomlf/mlfbook.git> that contains supplementary Python codes of all methods/examples.

Featured with the balance of mathematical theorems and practical code examples of ML, this book will help you acquire an in-depth understanding of ML algorithms as well as hands-on experience. After reading *An Introduction to Machine Learning in Quantitative Finance*, ML tools will not be a black box to you anymore, and you will feel confident in successfully applying what you have learnt to empirical financial data!



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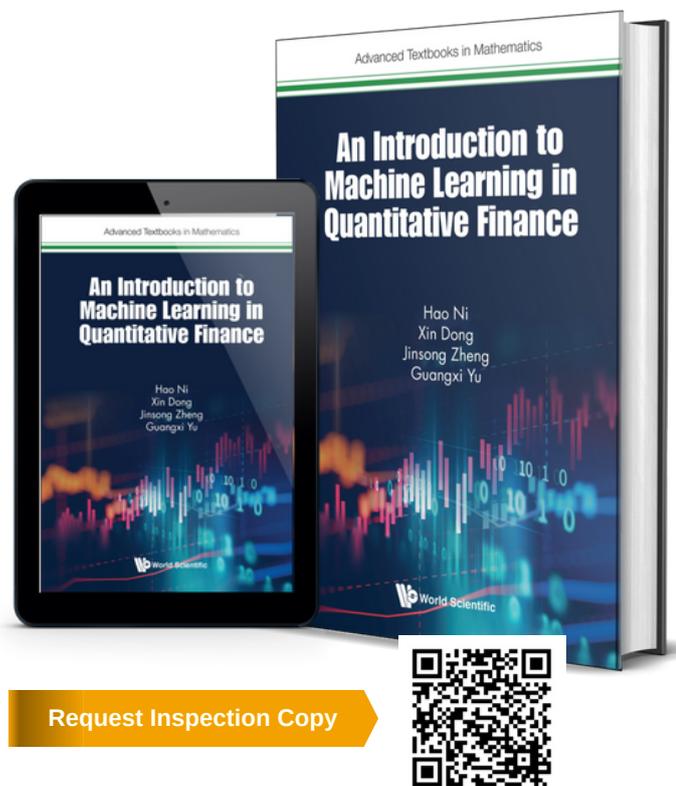
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## TABLE OF CONTENTS

- Preface
- About the Authors
- Acknowledgments
- Disclaimer
- Listings
- Overview of Machine Learning and Financial Applications
- Supervised Learning
- Linear Regression and Regularization
- Tree-based Models
- Neural Networks
- Cluster Analysis
- Principal Component Analysis
- Reinforcement Learning
- Case Study in Finance: Home Credit Default Risk
- Bibliography
- Index



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## READERSHIP

This textbook is suitable for MSc students or final year undergraduate students in financial mathematics, machine learning or computational finance. It would serve as a graduate textbook in introducing machine learning and its applications in quantitative finance. It may also be appropriate for those interested in pursuing a career in quantitative finance or for practitioners in the financial sector who wish to develop an in-depth understanding of machine learning and its applications to finance.

## ABOUT THE AUTHORS

**Hao Ni** is an associate professor in financial mathematics at University College London (UCL) and a Turing Fellow at the Alan Turing Institute since September 2016. Prior to this, she was a visiting postdoctoral researcher at ICERM and Department of Applied Mathematics at Brown University from September 2012 to May 2013. She continued her postdoctoral research at the Oxford-Man Institute of Quantitative Finance until 2016. She finished her D.Phil. in mathematics at the University of Oxford. Her research interests include stochastic analysis, financial mathematics and machine learning. More specifically, she is interested in non-parametric modelling effects of complex multi-modal data streams through rough paths theory and machine learning. Moreover, she has research interests on real-world applications, such as human-computer interface, computer vision and finance.

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