

Workshop 1:

Techniques and Strategies for Intraday Trading,
25 June 2018

Workshop 2:

Introduction to Deep Learning: Overview, tools
and applications, 26 June 2018

In association with conference

AI, Machine Learning and Sentiment Analysis Applied to Finance



25, 26 June 2018, London

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**Part I : Market Microstructure and Algorithmic Trading****Title 1: Different Components of Algorithmic Trading Systems - increasing profitability by optimising systems.**

Presenter: Rajib Ranjan Borah, CEO, iRage Capital

Summary: By properly leveraging the power of technology, a trader can increase the profitability of an already profitable systematic trading strategy multi-fold. This talk will look at the evolution of algorithmic trading systems - the efficiency introduced at each step, and the implication for a trader looking at automating their trading strategies. The talk will also try to introduce participants to the various technological complexities at exchanges - and opportunities that could exist because of the same. The aim will be to have an interactive discussion and understand the functional implications (for quantitative traders) of technological complexities.

Title 2: Applying Machine Learning to Algorithmic Trading Strategies

Presenters: Humberto Brandao, Professor, Federal University of Alfenas & Douglas Castilho, PhD candidate, University of São Paulo

Summary: The objective of this presentation is to show you how to create databases from your own strategies and adapt them for Machine Learning methods. Besides showcasing different generic algorithmic trading strategies, some machine learning methods are also explained with a discussion about different kinds of validation processes. This presentation comprises of 2 parts; each 1.5 hours long with coding sessions using R incorporated into the programme.

Part II : Option Portfolio Management

Presenter: Rajib Ranjan Borah, CEO, iRage Capital

Summary: This discussion will aim to demystify the world of option trading. To be able to manage option portfolios better, a strong understanding of the way Option Greeks behave in various market conditions is critical. In this talk, not only are the first order derivatives discussed, but higher order derivatives will also be explained and simplified. New option trading methodologies, such as Forward Volatility, will be introduced.

Understanding the Greeks

- ✓ Simple Option Greeks: Delta, Vega, Gamma, Theta and their behaviour. How different market characteristics affect these Greeks.
- ✓ Simplification of higher order Greeks: Vanna, Charm, Color, Speed, Zomma, Vomma & Veta.

Some practical aspects

- ✓ Trading forward volatility
- ✓ Managing dividend risks and handling stock borrowing risks
- ✓ How to analyse option positions spread across a multitude of instruments and underlyings.

Speakers' Profiles



Rajib Ranjan Borah is the co-founder & CEO of iRage, one of India's leading High-Frequency Trading firms, which manages potentially the broadest option portfolio book in India. He is also the co-founder and director of QuantInsti, an 'Algorithmic and Quantitative Trading' training and research institute which has trained thousands of professionals from over 130 countries. His prior experiences include high-frequency trading on all major US & European exchanges (Optiver, Amsterdam); data analytics technology (Oracle); business strategy for a trading firm & derivatives exchanges (Strategy Consulting, PwC). Rajib has thrice represented India at the World Puzzle Championship. He was also a finalist at the Indian National Biology Olympiad (top 24 nationwide). Rajib holds an MBA from IIM Calcutta, a bachelor's degree in Computer Engineering from NIT Surathkal; and has internship experiences with Bloomberg in New York (derivatives research) & Solutia's EMEA strategy HQ in Belgium.



Humberto Brandão is the Head of the Research & Development Lab (R&D Lab) at Federal University of Alfenas (Brazil), where he is also a Professor. He has been working on Algorithmic Trading using Machine Learning since 2009. During this period, he created a realistic simulator, which has been used for High-Frequency Trading in Brazil. As a consultant for hedge funds, Humberto has been applying different techniques in order to improve their return and risk over different kind of strategies. Recently, Humberto won several important prizes in competitions related to Algorithmic Trading and Data Science.



Douglas is a PhD student in Computer Science and Computational Mathematics at the University of São Paulo (Brazil) and visiting researcher in University of Porto (Portugal). He obtained his MSc degree in Computer Science in 2014 from the Federal University of Minas Gerais - Brazil. He is researcher and professor at Federal Institute of Education, Science and Technology of South of Minas Gerais. During his career, he was awarded with Outstanding Student prize in 2012, granted by the Brazilian Society of Computing. He has been working with machine learning and financial market since 2010. Recently, he participated as finalist in Data Science Game 2017, an international competition for students held in Paris, France. He researches in areas of Computational Intelligence, Online Social Networks, Deep Learning and Financial Market, with emphasis on High Frequency Trading and Algotrading Improvement Techniques.

**Workshop Objectives:**

- ✓ To provide an overview of Machine Learning in general and deep learning in particular.
- ✓ Explain the scope and applicability of deep learning
- ✓ Motivate the attendees with real world use cases
- ✓ Introduce to the attendees open source tools such as TensorFlow, Keras and Python 3.6.

Learning Outcomes:

The attendees will learn how to use deep learning tools to construct prototypes of real world applications in multiple domains.

- ✓ Foundations of Convolutional Neural Networks
- ✓ MNIST Classification using CNN
- ✓ Solving Multi-Class Image Classification Problems: Case Study
- ✓ Improving CNN performance - more techniques
- ✓ Introduction to TensorFlow and Keras
- ✓ Understand the high-level theory and key language around Deep Learning and Generative Adversarial Networks
- ✓ Architect GANs that create convincing images in the style of human-drawn illustrations

Requirements:

- ✓ Experience in Python (object-oriented programming)
- ✓ Shell and Bash commands
- ✓ Fundamentals of Machine learning or statistics
- ✓ Fundamentals of Deep learning
- ✓ College calculus 101

Session 1: Using Deep Learning for Natural Language Processing

Summary: Deep learning has revolutionised the techniques of natural language processing (NLP) and multiple organisations are harnessing this emerging NLP capability to enhance their products and services. The technology barrier is significantly reduced with open source technologies that are easy to configure and use. Several generic open source tools are available in machine learning, including deep learning, which can be customized for natural language processing. This presentation will explain to the participants how to use deep learning and customize NLP based applications for their industry.

Session 2: Applications of Deep Learning: Explained with Use Cases

Summary: In recent times, the explosive growth of data and its harnessing through Artificial Intelligence have impacted most of the B2B and B2C businesses and markets. Naturally there is considerable interest in acquiring knowledge and skills in this field. In this half day tutorial, we introduce the motivations, concepts, models and algorithms which are used in deep learning. We then explain how it is applied in domains of natural language processing and image classification. The illustrative prototype applications are constructed using TensorFlow. Participants will learn how to build and deploy deep learning models using TensorFlow.

**Session 3: Applied Deep Learning with TensorFlow**

Summary: An introduction to Deep Learning with interactive demos using Google's TensorFlow library and its high-level API, Keras. Essential theory of Deep Learning is provided, with an intuitive understanding of underlying foundations. Also, hands-on code run-throughs provided in Python-based Jupyter notebooks.

Session 4: Generative Adversarial Networks (GANs): Advanced Topics in Deep Learning

Summary: Generative Adversarial Networks (GANs) are deep neural net architectures comprised of two networks, the generator and the discriminator, pitting one against the other (thus the "adversarial"). Recent applications of GANs have enabled the fabrication of stunning and realistic images with flexible, user-specifiable elements.

Session 5: Introduction to Deep Learning with Applications

Summary: This workshop covers the essentials of deep learning from a mathematical and programming perspective.

- ✓ What is deep learning?
- ✓ Types of deep learning
- ✓ Mathematics of Deep Learning: universal approximation using neural nets, Backpropagation, and techniques for fitting deep learning nets.
- ✓ Programming deep learning: tensorflow, mxnet, h2o in R and Python with illustrated applications.



Jayadeep Shitole is a Research Analyst and Software Developer at OptiRisk Systems. He provides support to hedge fund clients of OptiRisk Systems in setting up their algorithmic trading systems. He has also been employed as a Data Scientist for a leading Big Data analytics company, where he worked on designing, developing, and deploying data-driven predictive models to solve business problems using machine learning and statistical modelling.



Dr. Nishant Chandra has driven machine learning and natural language innovation in BFSI, e-commerce, R&D, and mobile telecom industries in USA and India. He developed and implemented natural language predictive models that are deployed in top banks and telecom companies resulting in significant impact across their value chain.

For his contributions, Dr. Chandra was acknowledged as one of the top 10 data scientists in India. He has received the prestigious Barrier Fellowship and several other awards and marks of recognition. The Department of Homeland Security, United States Government, has classified Dr. Chandra as an outstanding researcher.

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He was the conference session chair for the GSPx conference at San Jose, California. He has been a reviewer for IEEE transactions, served on the editorial board of the Human Language Technology conference, and spoken at several international conferences. He also has five assigned patents and several journal and conference publications. Dr. Chandra is a passionate puzzler who invents puzzles and has represented India in the World Puzzle Championship at Stamford, Connecticut. He received his Ph.D. in Electrical and Computer Engineering from Mississippi State University.

Dr. Chandra is currently Data Science Leader at AIG.



Sanjiv Das is the William and Janice Terry Professor of Finance at Santa Clara University's Leavey School of Business. He was previously Associate Professor at Harvard Business School and UC Berkeley. He holds post-graduate degrees in Finance (M.Phil and Ph.D. from New York University), Computer Science (M.S. from UC Berkeley), an MBA from the Indian Institute of Management, and is a qualified Cost and Works Accountant.

He edits several academic journals. Prior to being an academic, he worked in the derivatives business as a Vice-President at Citibank. His current research interests include: the modeling of default risk, machine learning, social networks, derivatives pricing models, portfolio theory, and venture capital. He has published over ninety articles in academic journals, and won numerous awards for research and teaching. His recent book "Derivatives: Principles and Practice" was published in May 2010. He currently also serves as a Senior Fellow at the FDIC Center for Financial Research.

Workshop Price

Workshop Price Per Day	Super Early Bird until 30 April 2018	£150 + VAT
	Early Bird until 25 May 2018	£225 + VAT
	Standard Rate	£300 + VAT

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