GRAND CONNAUGHT ROOMS, LONDON

MACHINE LEARNING & AI IN QUANTITATIVE FINANCE CONFERENCE

14TH - 16TH MARCH 2018

SPEAKERS

Abdel Lantere: Data Scientist, Quantitative Consultant, **HSBC**

Vacslav Glukhov, PhD: Executive Director, Linear Quantitative Research, Global Equities, **J.P. Morgan**

Miquel Noguer Alonso: Adjunct Assistant Professor, **Columbia University**

Zhongmin Luo: Independent Consultant, Researcher, **Birkbeck, University Of London**

Paul Bilokon: Founder, CEO, **Thalesians,** Senior Quantitative Consultant, **BNP Paribas** & Visiting Lecturer, **Imperial College**

Artur Sepp: Director, Senior Quantitative Strategist, **Julius Baer**

Ignacio Ruiz: Founder & CEO, **MoCaX Intelligence**

Tomaso Aste: Professor of Complexity Science, **UCL Computer Science**

Claudi Ruiz Camps: Machine Learning, Deep Learning Specialist, **ABN AMRO Clearing Bank N.V.**

Yves Hilpisch: Founder and Managing Partner, **The Python Quants**

Marleen Meier: Quantitative Risk Analyst, Data Visualization, **ABN AMRO Clearing Bank N.V.**

Emilio Viudez-Ruido: Head of Clients Solutions, **MoCaX Intelligence**

John Barclay: Managing Director, **RiskTensor**

Saeed Amen: Quant Strategist & Trader, **Cuemacro**

Farhan Feroz: eFX Quantitative Trader, **UBS**

Pawel Chilinski: Quantitative Trader, **UBS**

Marco Bianchetti: Head of Fair Value Policy, **Intesa Sanpaolo**

Marco Scaringi: Quant Risk Analyst, **Intesa Sanpaolo**

Benjamin Keen: Consultant (Data Science, Software Engineering), **Hitachi Consulting**

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WEDNESDAY 14TH MARCH:
PRE-CONFERENCE WORKSHOP DAY
Machine Learning in Finance: A Practical View
by Miquel Noguer Alonso: Columbia University

THURSDAY 15TH MARCH:
MAIN CONFERENCE, DAY ONE
Machine Learning & Ai In Quantitative Finance

FRIDAY 16TH MARCH:
MAIN CONFERENCE, DAY TWO
Machine Learning & Ai In Quantitative Finance

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Also, Wi-Fi access will be available at the venue to view presentations on laptops and mobile devices.

PRE-CONFERENCE WORKSHOP: WEDNESDAY 14TH MARCH

DAY SCHEDULE: 09:00 – 17:00
BREAK: 10:30 – 11:00 / LUNCH: 12:30 – 13:30 / BREAK: 15:00 – 15:30

MACHINE LEARNING IN FINANCE : A PRACTICAL VIEW
BY MIQUEL NOGUER ALONSO: UBS & COLUMBIA UNIVERSITY

OUTLINE

- Using machine learning in the new financial markets big data landscape
- Big Data in Finance Landscape
- Infrastructure and technologyData sources
- Modern data analysis - Structured and Unstructured Data & New Models
- Classical and advanced models
- Machine Learning models in practice
- Machine learning robust modeling
- The future of machine learning in finance

Big Data in Finance Landscape

- Big data in finance landscape: Financial modeling, data governance, integration, NoSQL, batch and real-time computing and storage
- Infrastructure and technology
- New data sources
- Modern data analysis: Structured / Unstructured data and new models

Machine Learning Models

- Supervised learning
- Unsupervised learning
- Reinforcement learning
- Deep learning
- Advanced machine learning models

Machine learning in finance - Practice

- Momentum and Mean Reversion
- Sentiment Analysis
- Asymmetric Trading Strategies
- Non Linear Multi-Factor Models
- High Frequency Trading
- Advanced Machine Learning

Machine learning in finance - Opportunities and challenges

- Algo-Grading 101
- Interpretation
- Data mining biases: overfitting, survivorship and data-snooping
- Robust trading strategies
- The future of machine learning in finance

PRE-CONFERENCE WORKSHOP: WEDNESDAY 14TH MARCH

DAY SCHEDULE: 09:00 – 17:00
BREAK: 10:30 – 11:00 / LUNCH: 12:30 – 13:30 / BREAK: 15:00 – 15:30

COURSE TUTOR:

Miquel Noguer Alonso is a financial markets practitioner with more than 20 years of experience in asset management, he is currently working for UBS AG (Switzerland). He worked as a CFO and CIO for a European bank from 2000 to 2006. He started his career at KPMG.

He is Adjunct Assistant Professor at Columbia University teaching Asset Allocation, Big Data in Finance, Fintech and Hedge Fund Professor at ESADE. He received an MBA and a Degree in business administration and economics in ESADE in 1993. In 2010 he earned a PhD in quantitative finance with a Summa Cum Laude distinction (UNED - Madrid Spain). He also holds the Certified European Financial Analyst diploma (2000).

His research interests range from asset allocation, big data to algorithmic trading and fintech. His academic collaborations include a visiting scholarship in Columbia University in 2013 in the Finance and Economics Department, in Fribourg University in 2010 in the mathematics department, and presentations in Indiana University, ESADE, London Business School, CAIA Association, AFI and several industry seminars.

MAIN CONFERENCE DAY ONE: THURSDAY 15TH MARCH

08:30 REGISTRATION AND MORNING WELCOME COFFEE

CHAIR:
Paul Bilokon: Founder, CEO, **Thalesians,**
Senior Quantitative Consultant, **BNP Paribas** & Visiting Lecturer, **Imperial College**

09:00 – 09:45 KEYNOTE SPEECH

by Abdel Lantere: Data Scientist, Quantitative Consultant, **HSBC**

"BLACK-BOX MACHINE LEARNING: IMPROVING TRANSPARENCY".

"Many of the state of the art machine learning applications are based on black-box models which are difficult to interpret and explain. With more ML-based models being integrated into live decision-making systems, new challenges will be faced by various functions within banks as well as by the regulators. This talk disucsses the challenges faced and presents techniques to help provide more transparency and better understanding of the results of a given ML black-box model."

09:45 – 10:30 USING MACHINE LEARNING METHODS FOR VOLATILITY TRADING

- Statistical models for realized volatility estimation and forecast
- Model selection using machine learning
- Supervised machine learning and learning to rank
- Applications for volatility trading and asset allocation

Presenter: Artur Sepp, Director, Senior Quantitative Strategist, **Julius Baer**

10:30 – 11:00 MORNING BREAK AND NETWORKING OPPORTUNITIES

11:00 - 11:45 MACHINE LEARNING MODELS

- Supervised learning
- Unsupervised learning
- Reinforcement learning
- Deep learning
- Advanced machine learning models

Presenter: Miquel Noguer Alonso: Adjunct Assistant Professor, **Columbia University**

11:45 - 12:30 CDS RATE CONSTRUCTION METHODS BY MACHINE LEARNING TECHNIQUES

- Financial institutions need to construct proxy CDS rates for counterparties lacking liquid CDS quotes, which are required for CVA pricing, CVA risk charge calculation, etc
- Existing CDS Proxy Methods do not meet regulatory requirements and are vulnerable to arbitrage
- After investigating 8 most popular Machine Learning algorithms, we show that Machine Learning techniques can be used to construct reliable CDS proxies that meet regulatory regulations while free from the above problem
- Feature variable selection can be critical for performance of CDS-proxy construction methods
- Effects of feature variable correlations have to be investigated in the case of financial data

Presenter: Zhongmin Luo: Independent Consultant, Researcher, **Birkbeck, University Of London**

12:30 - 13:30 LUNCH

MAIN CONFERENCE DAY ONE: THURSDAY 15TH MARCH

13:30 - 14:15 "MACHINE LEARNING FOR FINANCIAL SYSTEMS: WHERE IT CAN BE COMPETITIVE"

- Machine leraning ad artificial intelligent have been developed for domains that are very different to finance
- Financial data are noisy and training sets are very scarse
- Socio-economic systems continuously evolve and never repeat identical patterns
- New tools must be developed to operate with machine learning in these systems

Presenter: Tomaso Aste: Professor of Complexity Science, **UCL Computer Science**

14:15 - 15:00 AUTOENCODERS TO REDUCE THE DIMENSIONALITY OF FINANCIAL DATA

- The motivation: to capture non-linearities that escape Principal Component Analysis (PCA)
- Understanding autoencoders and their contribution to pricing a portfolio of derivatives
- Application: using autoencoders (to reduce the dimensionality of yield curves and volatility surfaces) and Chebyshev spectral decomposition we accelerate the revaluation of a portfolio of swaps and swaptions in a risk calculation. We share promising results and highlight the advantages of autoencoders as well as the practicalities of their implementation.

Presenter: Emilio Viudez-Ruido: Head of Clients Solutions, **MoCaX Intelligence**

15:00 - 15:30 AFTERNOON BREAK AND NETWORKING OPPORTUNITIES

15:30 - 16:30 UNSUPERVISED ANOMALY DETECTION IN FINANCE

'ABN AMRO Clearing Bank works with considerably large amounts of data every day and we design and implement Deep Learning models to approach some of our business cases. One example is, how to find real time anomalies (strange behaviors) in our data by using Unsupervised Anomaly Detection with TensorFlow and Spark. The output is being visualized with Tableau in order to express the anomalies and to make data-driven business decisions.'

Presenters: Claudi Ruiz Camps: Machine Learning, Deep Learning Specialist, &
Marleen Meier: Quantitative Risk Analyst, Data Visualization, **ABN AMRO Clearing Bank N.V.**

16:30 - 17:15 LEARNING THE OPTIMAL RISK

- Portfolio optimization from a risk management point of view
- Eligible risk optimization strategies
- Optimization metaheuristics and machine learning
- Test cases
- Mathematical precision vs effective risk hedging

Presenters: Marco Bianchetti: Financial and Market Risk Management, Head of Fair Value Policy &
Marco Scaringi: Financial and Market Risk Management, Quant Risk Analyst, **Intesa Sanpaolo**

MAIN CONFERENCE DAY ONE: THURSDAY 15TH MARCH

17:15 - 18:00 MACHINE LEARNING & AI IN QUANTITATIVE FINANCE PANEL

MODERATOR:

- **Paul Bilokon:** Founder, CEO, **Thalesians,**
  Senior Quantitative Consultant, **BNP Paribas**
  & Visiting Lecturer, **Imperial College**

PANELLISTS:

- **Miquel Noguer Alonso:** Executive Director, **UBS** & Adjunct Assistant Professor, **Columbia University**
- **Artur Sepp,** Director: Senior Quantitative Strategist, **Julius Baer**
- **Abdel Lantere:** Data Scientist, Quantitative Consultant, **HSBC**
- **Ignacio Ruiz:** Founder & CEO, **MoCaX Intelligence**
- **Claudi Ruiz Camps:** Machine Learning, Deep Learning Specialist, **ABN AMRO Clearing Bank N.V.**

TOPICS:

- What is the current state of utilisation of machine learning in finance?
- What are the distinct features of machine learning problems in finance compared to other industries?
- What are the best practices to overcome these difficulties?
- What's the evolution of a team using machine learning in terms of day to day operations?
- What is a typical front office 'Quant' skillset going to look like in three to five years time?
- How do we deal with model risk in machine learning case?
- How is machine learning expected to be regulated?
- What applications can you list among its successes?
- How much value is it adding over and above the "classical" techniques such as linear regression, convex optimisation, etc.?
- Do you see high-performance computing (HPC) as a major enabler of machine learning?
- What advances in HPC have caused the most progress?
- What do you see as the most important machine learning techniques for the future?
- What are the main pitfalls of using Machine Learning currently in trading strategies?
- What new insights can Machine Learning offer into the analysis of financial time series?
- Discuss the potential of Deep Learning in algorithmic trading?
- Do you think machine learning and HPC will transform finance 5-10 years from now?
- If so, how do you envisage this transformation?
- Can you anticipate any pitfalls that we should watch out for?

MAIN CONFERENCE DAY TWO: FRIDAY 16TH MARCH

08:30 MORNING WELCOME COFFEE

CHAIR:
Yves Hilpisch: Founder and Managing Partner, **The Python Quants**

09:00 - 10:00 KEYNOTE SPEECH

by Vacslav Glukhov, PhD: Executive Director, Linear Quantitative Research, Global Equities, **J.P. Morgan**

TOPICS IN SELF-LEARNING AGENTS AND TRADITIONAL QUANTITATIVE MODELS IN FINANCE

- What can we draw from our experience of training and running an industry first self-learning agent for electronic order execution?
- Will traditional hand-crafted heuristic- and quant-based execution algorithms go extinct within 10 years?
- Does the success of ML and AI agents in finance indicate the eventual demise of traditional quantitative models?
- Practical aspects of using feeder models and heuristics in AI agents for trading applications.
- Do we have practical solutions for the equivalence puzzle in Neural Nets?

10:00 - 10:45 BAYESIAN INFERENCE & MACHINE LEARNING FOR MARKET MAKING IN FX

Presenters: Farhan Feroz: eFX Quantitative Trader &
Pawel Chilinski: Quantitative Trader, **UBS**

10:45 - 11:15 MORNING BREAK AND NETWORKING OPPORTUNITIES

11:15 - 12:15 ENERGY TRADING AI

- Background and challenges
- Context: Relevance of AI
- How we solved the problem
- Lessons learned

FRTB
- Defining the challenge
- Assessing AI approaches
- Capturing the data
- Analysis and next steps

Presenters: John Barclay: Managing Director, **RiskTensor** &
Benjamin Keen: Consultant (Data Science, Software Engineering), **Hitachi Consulting**

12:15 - 13:00 FROM ARTIFICIAL INTELLIGENCE TO MACHINE LEARNING, FROM LOGIC TO PROBABILITY

Applications of Artificial Intelligence (AI) and Machine Learning (ML) are rapidly gaining steam in quantitative finace. These terms are often used interchangeably. However, the pioneering work on AI by participants of the Dartmouth Summer Research Project --- Marvin Minsky, Nathaniel Rochester, and Claude Shannon --- was more symbolic than numerical, and often used the language of logic. Recent advances in ML --- especially Deep Learning --- are more numerical than symbolic, and often use the language of probability. In this talk we shall show how to connect these two worldviews.

Presenter: Paul Bilokon: Founder, CEO, **Thalesians,** Senior Quantitative Consultant, **BNP Paribas** & Visiting Lecturer, **Imperial College**

MAIN CONFERENCE DAY TWO: FRIDAY 16TH MARCH

13:00 - 14:00 **LUNCH**

14:00 - 15:00 **AI-FIRST FINANCE AND ALGORITHMIC TRADING**

- This talk considers the consequences of recent advances in the field of Artificial Intelligence (AI) for finance in general and algorithmic trading in particular.
- The talk is mainly based on practical examples, using Python as well as Machine & Deep Learning techniques to come up with algorithmic trading strategies.
- The examples in turn are mainly based on (tick) data from FXCM Forex Capital Markets Ltd. and their new RESTful API for data retrieval and algorithmic trading.

Presenter: Yves Hilpisch: Founder and Managing Partner, **The Python Quants**

15:00 - 15:05 **QUICK AFTERNOON BREAK**

15:05 - 16:00 **USING BIG DATA TO TRADE FX (& PYTHON FOR FINANCE)**

- Discussion of what Big Data is with financial examples
- Brief overview of machine learning
- Case study on using machine readable Bloomberg News to trade FX
- Python for financial analysis with interactive demo

Presenter: Saeed Amen: Quant Strategist & Trader, **Cuemacro**

END OF CONFERENCE

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All delegates flying into London on the morning of the event are reminded that they should arrive 30 minutes before the workshop starts for registration. The hotels West End location is approximately 1 hour from all 3 main London airports, Heathrow, Gatwick and City. Returning flights should equally allow for the events finishing time.

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