DOWNTOWN CONFERENCE CENTER, NEW YORK CITY

THE 3RD MACHINE LEARNING & AI IN QUANTITATIVE FINANCE CONFERENCE USA

APRIL 3-5, 2019

SPEAKERS

Zura Kakushadze Ph.D: CEO, **Quantigic® Solutions.** Author, **"151 Trading Strategies"**

Cristian Homescu: Director, Portfolio Analytics **Bank of America Merrill Lynch**

Knarig Arabshian: Senior Associate Knowledge Engineer in Technology Innovation, **Federal Reserve Bank of New York**

Zhibai Zhang: Quantitative Researcher, **Guggenheim Partners**

Terry Benzschawel: Founder and Principal, **Benzschawel Scientific, LLC**

Petter Kolm: Director of the Mathematics in Finance Master's Program and Clinical Professor, **Courant Institute of Mathematical Sciences, New York University**

Steve Yalovitser: Co-Founder, **New York Quantum Computing Meet-up** and Director, XVA Quant Core Lead, **Wells Fargo**

Jeffrey Yau: Chief Data Scientist, **AllianceBernstein**

Miquel Noguer Alonso: Co–Founder and Chief Science Officer, **Artificial Intelligence Finance Institute (AIFI)**

Jos Gheerardyn: Co-Founder and CEO, **Yields.io**

Edvin Hopkins: Technical Consultant, **NAG**

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QWAFAFEW

CONFERENCE OVERVIEW

LOCATION:
Downtown Conference Center
157 William Street
New York, NY 10038
USA
Tel: +1 212 618 6990
www.downtownmeetings.com

WEDNESDAY APRIL 3, 2019
PRE-CONFERENCE WORKSHOP DAY
From Machine Learning To Artificial Intelligence In Finance Workshop
by Miquel Noguer Alonso: Co-Founder, Artificial Intelligence Finance Institute – AIFI

THURSDAY APRIL 4, 2019
MAIN CONFERENCE, DAY ONE
The 3rd Machine Learning & AI In Quantitative Finance USA

FRIDAY APRIL 5, 2019
MAIN CONFERENCE, DAY TWO
The 3rd Machine Learning & AI In Quantitative Finance USA

IMPORTANT NOTES:

The presentation files will be made available for download via a password protected website before the event. Please print out each presentation if you wish to have hard copies before the conference and bring them with you.

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

PRE-CONFERENCE WORKSHOP: WEDNESDAY APRIL 3

DAY SCHEDULE: 9:00 – 5:30
REGISTRATION: 8.30 / START TIME: 9:00 / BREAK: 10:30 – 11:00 / LUNCH: 12:30 – 1:30 / BREAK: 3:15 – 3:30

FROM MACHINE LEARNING TO ARTIFICIAL INTELLIGENCE IN FINANCE WORKSHOP BY MIQUEL NOGUER ALONSO: CO-FOUNDER AND CHIEF SCIENCE OFFICER, ARTIFICIAL INTELLIGENCE FINANCE INSTITUTE – AIFI

COURSE OUTLINE:

Finance Practitioners and Machine Learners will learn ML techniques in Finance and Implementation of ML projects in Finance. We will cover the most relevant ML and AI Algorithms.

An excellent blend of mathematics, financial intuition and Python to learn Machine and Artificial Intelligence in Finance.

Quantitative Finance
- Review Quantitative Finance
- Alternative data

Machine Learning Modeling
- Intro
- Mathematics of Machine Learning
- Machine Learning Modeling Framework
- Performance Metrics
- Model Selection
- Variable Selection
- Model Trade-Offs

Supervised Learning: Classification
- Logistic and Softmax Regression
- Decision Trees
- Naïve Bayes
- Support Vector Machines
- Linear and Quadratic Discriminant Analysis

Ensembles
- Definitions
- Bagging and Boosting
- Random Forest
- Adaboost, Xg Boost

Supervised Learning: Regressions
- Linear Regression
- Modern Linear regressions
- Non linear Regressions
- Neural Networks

Unsupervised Learning
- Clustering
- PCA

Deep Learning
- Deep Learning definitions
- Recurrent Neural Networks
- Auto-Encoders
- Long Short Term Memory Networks

Reinforcement Learning
- Reinforcement Learning Definitions
- Inverse Reinforcement Learning

Natural Language Processing
- NLP definitions
- Sentiment Analysis
- NLTK

Applications
- Interest Rate Modeling
- Stock Picking
- Credit Applications
- Option Pricing
- High Frequency Trading

Python Notebooks

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FROM MACHINE LEARNING TO ARTIFICIAL INTELLIGENCE IN FINANCE WORKSHOP BY MIQUEL NOGUER ALONSO: CO-FOUNDER AND CHIEF SCIENCE OFFICER, ARTIFICIAL INTELLIGENCE FINANCE INSTITUTE – AIFI

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 APRIL 4

8:00 – 9:00 REGISTRATION AND MORNING WELCOME COFFEE

9:00 – 10:30 MACHINE LEARNING IN FINANCE: HISTORY AND CURRENT APPLICATIONS

Overview of Big Data and Machine Learning

1. Neural Networks
2. Decision Trees
3. Early Applications of Machine Learning in Finance
4. Machine Learning Models of Default, Recovery, and Relative Value
5. Recent Advances
6. Perspectives on the Future

Presenter: Terry Benzschawel: Founder and Principal, **Benzschawel Scientific, LLC**

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

11:00 – 12:00 KEYNOTE: RISK MODELS FOR QUANT TRADING

Presenter: Zura Kakushadze Ph.D: CEO, **Quantigic® Solutions.**
Author, **"151 Trading Strategies"**

12:00 – 12:45 DYNAMIC REPLICATION AND HEDGING: A REINFORCEMENT LEARNING APPROACH

Abstract:

We address the problem of how to optimally hedge an options book in a practical setting, where trading decisions are discrete and trading costs can be nonlinear and difficult to model. Based on reinforcement learning, a well-established machine learning technique, our model is shown to be flexible, accurate and very promising for real-world applications.

This is joint work with Gordon Ritter.

Presenter: Petter Kolm: Director of the Mathematics in Finance Master's Program and Clinical Professor,
Courant Institute of Mathematical Sciences, New York University

12:45 – 2:00 LUNCH

2:00 – 2:45 QUANTIFYING MODEL UNCERTAINTY WITH ARTIFICIAL INTELLIGENCE

- Defining model risk and model uncertainty
- Overview of relevant regulatory frameworks
- Measuring uncertainty with ML
- Model risk of AI

Presenter: Jos Gheerardyn: Co-Founder and CEO, **Yields.io**

2:45 – 3:30 USING ARTIFICIAL INTELLIGENCE TO MEASURE SUSTAINABLE DEVELOPMENT GOALS

Presenter: Miquel Noguer Alonso: Co–Founder and Chief Science Officer, **Artificial Intelligence Finance Institute – AIFI**

MAIN CONFERENCE, DAY ONE: THURSDAY APRIL 4

3:30 – 4:00 AFTERNOON BREAK AND NETWORKING OPPORTUNITIES

4:00 – 4:45 TIME SERIES FORECASTING UTILIZING DEEP LEARNING TECHNIQUES

Presenter: Jeffrey Yau: Chief Data Scientist, **AllianceBernstein**

4:45 – 5:45 MACHINE LEARNING & AI IN QUANTITATIVE FINANCE PANEL

PANELLISTS:

- **Terry Benzschawel:** Founder and Principal, **Benzschawel Scientific, LLC**
- **Knarig Arabshian:** Senior Associate Knowledge Engineer in Technology Innovation, **Federal Reserve Bank of New York**
- **Jeffrey Yau:** Chief Data Scientist, **AllianceBernstein**
- **Petter Kolm:** Director of the Mathematics in Finance Master's Program and Clinical Professor, **Courant Institute of Mathematical Sciences, New York University**
- **Jos Gheerardyn:** Co-Founder and CEO, **Yields.io**
- **Zura Kakushadze Ph.D:** CEO, **Quantigic® Solutions.** Author, **"151 Trading Strategies"**
- **Miquel Noguer Alonso**: Co–Founder and Chief Science Officer, **Artificial Intelligence Finance Institute (AIFI)**

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.
- Discuss quantum computing in quant finance:
    - Breakthroughs
    - Applications
    - Future uses

MAIN CONFERENCE, DAY TWO: FRIDAY APRIL 5

8:30 – 9:00 MORNING WELCOME COFFEE

9:00 – 10:00 KEYNOTE SPEECH APPLYING MACHINE LEARNING TO INVESTMENT AND WEALTH MANAGEMENT: OPPORTUNITIES AND CHALLENGES

Presenter: Cristian Homescu: Director, Portfolio Analytics, **Bank of America Merrill Lynch**

10:00 – 10:45 QUANTUM MACHINE LEARNING

- This session will analyse the emerging techniques applicable to quantum computing and its applications.

Presenter: Steve Yalovitser: Co-Founder, **New York Quantum Computing Meet-up** and Director, XVA Quant Core Lead, **Wells Fargo**

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

11:15 – 12:00 MARKET MICROSTRUCTURE IN THE AGE OF MACHINE LEARNING

- This presentation will discuss how machine learning algorithms can be used to study and evaluate market microstructure.

Presenter: Zhibai Zhang: Quantitative Researcher, **Guggenheim Partners**

12:00 – 12:45 NON-NEGATIVE MATRIX FACTORIZATION FOR ANALYSING HIGH-DIMENSIONAL DATASETS

Abstract:

Non-negative matrix factorization (NMF) is a widely-used tool for analysing high-dimensional datasets. Its popularity stems from its ability to extract meaningful factors from the data. Applications include image processing, text mining and bioinformatics. In this talk we will give an overview of NMF and demonstrate our implementations of recent NMF algorithms by automatically classifying a series of websites based on their content. We will then briefly discuss applications of NMF in finance.

Presenter: Edvin Hopkins: Technical Consultant, **NAG**

12:45 – 2:00 LUNCH

MAIN CONFERENCE, DAY TWO: FRIDAY APRIL 5

2:00 – 2:45 MACHINE LEARNING FOR SECURITY SELECTION AND THE DANGERS OF OVERFITTING

- Data prep and feature engineering: Is the AI built over the data based on solid foundations?
- Issues of overfitting and maximizing the signal to noise ratio
- Evaluating your algorithm choice: what do you want to achieve?
- Understanding fake signals: when machine learning fails

Presenter: To be confirmed

2:45 - 3:30 QUANTITATIVE FACTOR INVESTING USING ALTERNATIVE DATA AND MACHINE LEARNING

Abstract:

To gain an edge in the markets quantitative hedge fund managers require automated processing to quickly extract actionable information from unstructured and increasingly non-traditional sources of data. The nature of these "alternative data" sources presents challenges that are comfortably addressed through machine learning techniques. We illustrate use of AI and ML techniques that help extract derived signals that have significant alpha or risk premium and lead to profitable trading strategies.

This session will cover the following topics:

- The broad application of machine learning in finance
- Extracting sentiment from textual data such as news stories and social media content using machine learning algorithms
- Construction of scoring models and factors from complex data sets such as supply chain graph, options (implied volatility skew, term structure) and ESG (Environmental, Social and Governance)
- Robust portfolio construction using multi-factor models by blending in factors derived from alternative data with the traditional factors such as fama-french five-factor model.

Presenter: Arun Verma: Quantitative Research Solutions, **Bloomberg, LP**

3:30 – 3:45 AFTERNOON COFFEE AND END OF CONFERENCE

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The Artificial Intelligence Finance Institute's (AIFI) mission is to be the world's leading educator in the application of artificial intelligence to investment management, capital markets and risk. We offer one of the industry's most comprehensive and in-depth educational programs, geared towards investment professionals seeking to understand and implement cutting edge AI techniques.

Taught by a diverse staff of world leading academics and practitioners, the AIFI courses teach both the theory and practical implementation of artificial intelligence and machine learning tools in investment management. As part of the program, students will learn the mathematical and statistical theories behind modern quantitative artificial intelligence modeling. Our goal is to train investment professionals in how to use the new wave of computer driven tools and techniques that are rapidly transforming investment management, risk management and capital markets.

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QWAFAFEW is an informal organization of quantitatively oriented professionals in various aspects of financial services, primarily investment management.

The members span the gamut from owners and senior executives of investment related organizations to recent entrants to the industry. Most attendees have some technical training beyond the M.B.A. level, and many have Ph.D.s All share a common interest in quantitative solutions to understanding investment markets.

Please visit www.qwafafew.org for more information.

Yields.io is the first FinTech platform that uses AI for real-time model risk management on an enterprise-wide scale.

Our clients use our solution to speed up model validation tasks, to generate regulatory compliant documentation and to industrialize model monitoring. The platform works with all models that are used within the financial sector such as credit risk models, valuation algorithms, market risk, AML, AI and behavioural models.

Yields.io was founded by Jos Gheerardyn and Sébastien Viguié. The company is expanding quickly and has offices in Brussels and London. Yields.io has an international portfolio of clients with both investment banks as well as regional financial institutions.

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The Thalesians are a think tank of dedicated professionals with an interest in quantitative finance, economics, mathematics, physics and computer science, not necessarily in that order.

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