HOTEL ASTON LA SCALA NICE, FRANCE - 26TH / 27TH / 28TH SEPTEMBER 2018

THE 14TH QUANTITATIVE FINANCE CONFERENCE

INVITED & CONFIRMED PRESENTERS

Georgios Papaioannou: Trading Strategist, **Bank of America Merrill Lynch**
Vladimir Piterbarg
Vacslav Glukhov: Executive Director, Linear Quant Research, Global Equities, **J.P. Morgan**
Jesper Andreasen: Global Head Of Quantitative Research, **Saxo Bank**
Abdel Lantere: Data Scientist, Quantitative Consultant, **HSBC**
Michael Pykhtin: Manager, Quantitative Risk, **Federal Reserve Board**
Dominique Bang: Director, Head of IR Vanilla Modelling, **Bank of America Merrill Lynch**
Riccardo Rebonato: Professor of Finance, **EDHEC Business School**
Miquel Noguer Alonso: Adjunct Assistant Professor, **Columbia University**
Alexei Kondratyev: Managing Director Financial Markets, **Standard Chartered Bank**
Pierre Henry-Labordere: Quant, Global Markets Quantitative Research, **Société Générale**
Christoph Burgard: Head of Risk Analytics for Global Markets, **Bank of America Merrill Lynch**
Julien Guyon: Senior Quant, **Bloomberg L.P.**
Ignacio Ruiz : Founder & CEO, **MoCaX Intelligence**
Alexander Antonov: Director, **Standard Chartered Bank**
Jon Gregory: Independent xVA Expert
Andrew McClelland: Director, Quantitative Research, **Numerix**
Andrea Pallavicini: Head of Equity, FX and Commodity Models, **BANCA IMI**
Christian Fries: Head of Model Development, **DZ Bank**
Andrew Green: Managing Director and XVA Lead Quant, **Scotiabank**
Massimo Morini: Head of Interest Rate and Credit Models, **Gruppo Intesa Sanpaolo**
Peter Jaeckel: Deputy Head Of Quantitative Research, **VTB Capital**
Juliusz Jablecki: Divisional Head, **Narodowy Bank Polski**
Uwe Naumann: Professor for Computer Science, **RWTH Aachen University**
Martin Engblom: Co-CEO triCalculate, **TriOptima, an NEX Group Company**
Assad Bouayoun: Director, XVA Senior Quant, **Scotiabank**
Gilles Artaud: Market and Counterparty Risk, **Credit Agricole-CIB**
Paul Bilokon: Founder, CEO, **Thalesians &** Senior Quantitative Consultant, **BNP Paribas**
Sheir Yarkoni: Data Scientist, **D-Wave Systems Inc**

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OVERVIEW

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Main Conference presentation files on USB memory sticks will be provided on arrival. The Main Conference files will also 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 conference venue to view presentations on laptops and mobile devices.

CONFERENCE BOOKINGS: DISCOUNT STRUCTURE

- When 2 colleagues attend the 3rd goes free!
- ~~Super Early Bird Discount: 25% Until 18th May~~
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PRE-CONFERENCE WORKSHOP DAY WEDNESDAY 26TH SEPTEMBER:

1. Machine Learning in Finance: A Practical View by Miquel Noguer Alonso: Columbia University

2. Machine Learning Applications in the XVA Space by Andrew Green: XVA Lead Quant, Scotiabank

3. Advanced Adjoint Algorithmic Differentiation (AAD) by Uwe Naumann: RWTH Aachen University

MAIN CONFERENCE STREAMS

THURSDAY 27TH SEPTEMBER - DAY ONE:

- XVA, MVA & Initial Margin
- Machine Learning & Quantum Computing Techniques
- Volatility & Modelling Techniques

FRIDAY 28TH SEPTEMBER - DAY TWO:

- XVA, AAD, MVA & Initial Margin
- Machine Learning & Quantum Computing Techniques
- Volatility & Modelling Techniques

As always, delegates are not restricted to attend single streams on the main conference. You have the opportunity to hop around the different streams and attend the presentations that benefit you the most.

Stream presentation times will run concurrently with each other.

CONFERENCE LOCATION:

Hotel Aston La Scala
12 avenue Félix Faure
06000 Nice
France

Tel: +39(0)4 9217 5300
Website: www.hotel-aston.com

GALA DINNER - THURSDAY 27TH SEPTEMBER, 20:00

PLAGE BEAU RIVAGE, NICE

PRE-CONFERENCE WORKSHOP: WEDNESDAY 26TH SEPTEMBER

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

DAY SCHEDULE: 09:00 – 17:30
BREAK: 10:30 – 10:45 / LUNCH: 12:30 – 13:30 / BREAK: 15:15 – 15:30

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 26TH SEPTEMBER

DAY SCHEDULE: 09:00 – 17:30
BREAK: 10:30 – 10:45 / LUNCH: 12:30 – 13:30 / BREAK: 15:15 – 15:30

TUTOR BIOGRAPHY

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.

PRE-CONFERENCE WORKSHOP: WEDNESDAY 26TH SEPTEMBER

MACHINE LEARNING APPLICATIONS IN THE XVA SPACE
BY ANDREW GREEN: XVA LEAD QUANT, SCOTIABANK

DAY SCHEDULE: 09:00 – 17:30
BREAK: 10:30 – 10:45 / LUNCH: 12:30 – 13:30 / BREAK: 15:15 – 15:30

Foundations: CVA, DVA and FVA
- CVA & DVA by Replication
- Credit Mitigants
- FVA by Replication
- FVA & DVA (overlaps)
- FVA in pricing and accounting
- A brief tour of the XVA Monte Carlo engine

MVA
- Initial Margin and XVA
- MVA by Replication
- MVA for VaR-type IM (CCPs)
- MVA for SIMM-IM

KVA
- What is Capital?
- KVA by Replication
- KVA vs Hurdle Rates
- Which measure?
- The Cost of Capital

Introducing Machine Learning
- Types of machine learning problems:
- Motivation I: Multivariate Linear Regression
  - Supervised learning
    - Regression problems
    - Classifier problems
  - Unsupervised learning
- Motivation II: Logistic Regression
- Bias and Variance
- Regularization
- Neural Networks
  - Activation functions
  - Geometry
  - Forward and backpropagation
  - Initialization
- Deep Learning

Credit Curve Mapping as a Machine Learning Problem
- Dealing with Illiquid counterparties in XVA
- Key Requirements of the Map
  - Trading Requirements
  - Regulatory Requirements: Basel III & FRTB-CVA
- Classical Methods
- Classifier Approach
- Regression Approach

A tour of XVA ML Applications
- Optimising MVA
- Dimension Reduction: PCA & Autoencoders

TUTOR BIOGRAPHY
Andrew Green: Managing Director and XVA Lead Quant, Scotiabank

Andrew Green is a Managing Director and lead XVA Quant at Scotiabank in London. Prior to joining Scotiabank, Andrew held roles as a quantitative analysis in several different banks in London. He is the author of XVA: Credit, Funding and Capital Valuation Adjustments, published by Wiley.

PRE-CONFERENCE WORKSHOP: WEDNESDAY 26TH SEPTEMBER

ADVANCED ADJOINT ALGORITHMIC DIFFERENTIATION (AAD) BY UWE NAUMANN: RWTH AACHEN UNIVERSITY

DAY SCHEDULE: 09:00 – 17:30
BREAK: 10:30 – 10:45 / LUNCH: 12:30 – 13:30 / BREAK: 15:15 – 15:30

1. Motivation and Basic AAD

- Tangents and Adjoints: Story in a Nutshell
- Implementation
  (Code Generation Rules vs. Overloading)
- Case Study: Black-Scholes SDE
  (Euler-Maruyama Scheme)

- **Case Study: Black-Scholes PDE (Explicit Scheme)**

2. AAD of Linear Algebra and Implicit Functions

- Nonlinear Equations
- Basic Linear Algebra Subprograms
- Systems of Linear Equations
- Systems of Nonlinear Equations
- Convex Optimization
- Ordinary Differential Equations

- **Case Study: Black-Scholes PDE (Implicit Scheme)**

3. Checkpointing in AAD

- Adjoint Ensembles
- Adjoint Evolutions
- Multi-Level Checkpointing
- DAG and Call Tree Reversal Problems

- **Case Study: Black-Scholes SDE and PDE**

4. Second- and Higher-Order AAD

- Tangents and Adjoints
- (Code Generation Rules vs. Overloading)

- **Case Study: Black-Scholes PDE**

TUTOR BIOGRAPHY
Uwe Naumann: Professor of Computer Science, RWTH Aachen University

Uwe Naumann is the author of the popular text book on (Adjoint) Algorithmic Differentiation (AAD) titled "The Art of Differentiating Computer Programs" and published by SIAM in 2012. He holds a Ph.D. in Applied Mathematics / Scientific Computing from the Technical University Dresden, Germany.

Following post-doctoral appointments in France, the UK and the US, he has been a professor for Computer Science at RWTH Aachen University, Germany, since 2004. As a Technical Consultant for the Numerical Algorithms Group (NAG) Ltd. Uwe has been playing a leading role in the delivery of AAD software and services to a growing number of tier-1 investment banks since 2008.

MAIN CONFERENCE DAY ONE – THURSDAY 27TH SEPTEMBER

XVA, MVA & INITIAL MARGIN	MACHINE LEARNING & QUANTUM COMPUTING TECHNIQUES	VOLATILITY & MODELLING TECHNIQUES

08:00 – 09:00 REGISTRATION AND MORNING WELCOME COFFEE

09:00 – 09:45 KEYNOTE: GEORGIOS PAPAIOANNOU: TRADING STRATEGIST, BANK OF AMERICA MERRILL LYNCH

MACHINE LEARNING ENHANCED TRADING

09:45 – 10:30 PANEL: MACHINE LEARNING, AI & QUANTUM COMPUTING IN QUANTITATIVE FINANCE

Moderator:

- **Paul Bilokon: Founder,** CEO, **Thalesians,** Senior Quantitative Consultant, **BNP Paribas**

Panelists:

- **Miquel Noguer Alonso:** Adjunct Assistant Professor, **Columbia University**
- **Georgios Papaioannou:** Trading Strategist, **Bank of America Merrill Lynch**
- **Abdel Lantere:** Data Scientist, Quantitative Consultant, **HSBC**
- **Alexei Kondratyev:** Managing Director, Head of Prime Services Analytics, **Standard Chartered Bank**
- **Christoph Burgard:** Head of Risk Analytics For Global Markets, **Bank of America Merrill Lynch**

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

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

MAIN CONFERENCE DAY ONE – THURSDAY 27TH SEPTEMBER

XVA, MVA & INITIAL MARGIN

CHAIR:

JÖRG KIENITZ: PARTNER &
NIKOLAI NOWACZYK: CONSULTANT,
QUATERNION RISK MANAGEMENT

11:00 – 11:45 THE REVISED BASEL CVA FRAMEWORK
by Michael Pykhtin: Manager, Quantitative Risk, U.S. Federal Reserve Board

- The need to revise the framework
- The consultative paper
- The industry response
- The final rule

11:45 – 12:30 BACK TO CVA – TWO CURRENT ISSUES
by Jon Gregory: Independent xVA Expert

- Loss given default
  - Impact of different LGD assumptions
  - Structural seniority and waterfall priority
  - Entry price and exit price
- Wrong-way risk (WWR)
  - WWR in cross currency swaps
  - New evidence from the Quanto CDS market on Japanense names
  - Implied jump sizes across sector and rating
  - Evidence from the FX options market

MACHINE LEARNING & QUANTUM COMPUTING TECHNIQUES

CHAIR:

PAUL BILOKON:
FOUNDER, CEO, THALESIANS,
SENIOR QUANTITATIVE CONSULTANT,
BNP PARIBAS

11:00 – 11:45 MACHINE LEARNING MODELS
by Miquel Noguer Alonso: Adjunct Assistant Professor, Columbia University

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

11:45 – 12:30 "BLACK-BOX MACHINE LEARNING: IMPROVING TRANSPARENCY"
by Abdel Lantere: Data Scientist, Quantitative Consultant, HSBC

"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."

VOLATILITY & MODELLING TECHNIQUES

CHAIR:

TO BE CONFIRMED

11:00 – 11:45 TOUGH VOL
by Jesper Andreasen: Global Head Of Quantitative Research, Saxo Bank

- Fractional Brownian motion and analogies with interest rate modeling
- Fractional volatility: definition, motivation and empirical findings
- Expansions and short maturity limits for skew, smile, delta and digitals
- Connection with Hawkes processes and market micro structure models
- Numerical implementation

11:45 – 12:30 AN EXTENSION OF THE HESTON MODEL FOR P AND Q MEASURE MODELLING OF FX OPTIONS
by Riccardo Rebonato: Professor of Finance, EDHEC Business School

12:30 – 13:45 LUNCH

MAIN CONFERENCE DAY ONE – THURSDAY 27TH SEPTEMBER

XVA, MVA & INITIAL MARGIN

13:45 – 14:30 ADVANCED TECHNIQUES FOR EXACT SIMM-MVA CALCULATIONS
by Alexandre Antonov, Director, Standard Chartered Bank

- Initial margin (IM) and its projection to the future; MVA as a future IM interest
- Complexity of the MVA: one needs (exotic) portfolio sensitivities calculation for each scenario and observation data
- Particular difficulties with structured products: brute force MVA calculation time is unacceptably long
- An efficient method for the exact MVA calculation based on the future differentiation and its comparison with known approximations
- Numerical experiments for a Bermudan Swaption MVA: massive acceleration using the new method with respect to the brute force

14:30 – 15:15 DYNAMIC IM AND XVAS VIA CHEBYSHEV SPECTRAL DECOMPOSITION
by Ignacio Ruiz: Founder & CEO, MoCaX Intelligence

- The power of Chebyshev – MoCaX as a Smart interpolation scheme
- Selection of interpolating points and functions
- Chebyshev nodes Chebyshev polynomials in the context of Risk Calculations
- Theoretical basis: three fundamental theorems
- Example: Parametric Chebyshev interpolation for Risk Calculations
- Practical cases studies: CVA, CVA on exotics, Accurate MVA, Ultra-fast XVA sensitivities
- Commercial benefits: reduction of hardware costs, effective computation of risk metrics, hedging regulatory risk
- Generic AAD for any pricer via Chebyshev Decomposition

MACHINE LEARNING & QUANTUM COMPUTING TECHNIQUES

13:45 – 14:30 FROM ARTIFICIAL INTELLIGENCE TO MACHINE LEARNING, FROM LOGIC TO PROBABILITY
by Paul Bilokon: Founder, CEO, Thalesians, Senior Quantitative Consultant, BNP Paribas

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.

14:30 – 15:15 QUANTUM ANNEALING FOR MULTI-PERIOD XVA REVERSE STRESS TESTING
by Assad Bouayoun: Director, XVA Senior Quant, Scotiabank & Sheir Yarkoni: Data Scientist, D-Wave Systems Inc

- Modelling
  - XVA reverse stress testing formula
  - XVA reverse stress testing as a QUBO problem (Quadratic Unconstrained Binary Optimisation)
  - Generalisation to multi-period case
- Optimisation using annealing
  - Quantum annealing
  - Simulated annealing
- Applications
  - Simple portfolio of swaps
  - Firm level management

VOLATILITY & MODELLING TECHNIQUES

13:45 – 14:30 'LOCAL-STOCHASTIC VOLATILITY FOR VANILLA MODELLING: A TRACTABLE AND ARBITRAGE FREE APPROACH'
by Dominique Bang: Director, Head of Interest Rates Vanilla Modelling, London, Bank of America Merrill Lynch

- Mixing of Local and Stochastic Volatilities via Lamperti transform: replication formulae
- Normal SABR: Jamshidian's Trick and measure change for accurate option pricing proxies. Application to SABR Local Vol
- Heston Local Vol

14:30 – 15:15 PRICING SWAPTIONS WITHOUT TEARS
by Juliusz Jabłecki: Divisional Head, Narodowy Bank Polski

- Equity-like local volatility model for interest rate underlyings
- Approximate swap rate diffusion with "short rate" and "dividend"
- Pricing European and Bermudan swaptions without intensive yield curve modeling using techniques borrowed from the equity space
- Numerical examples

MAIN CONFERENCE DAY ONE – THURSDAY 27TH SEPTEMBER

XVA, MVA & INITIAL MARGIN

MACHINE LEARNING & QUANTUM COMPUTING TECHNIQUES

VOLATILITY & MODELLING TECHNIQUES

15:15 – 15:45 AFTERNOON BREAK AND NETWORKING OPPORTUNITIES

15:45 – 16:30 TOPIC AND PRESENTER TO BE CONFIRMED

16:30 – 17:15 JOHNSON DISTRIBUTIONS IN FINANCE - APPLICATIONS TO DYNAMIC INITIAL MARGIN ESTIMATION (JLSMC METHOD)
by Jörg Kienitz: Partner & Nikolai Nowaczyk: Consultant, Quaternion Risk Management

A further advantage of the new approach is that it only relies on the quantities required for any exposure or XVA calculation.

- Dynamic Initial Margin and Methods for its Calculation
- Monte Carlo Simulation and Least Squares Regression
- Johnson Distributions
- The JLSMC Method
- Backtesting / Benchmarking

(FULL DETAILS AVAILABLE ONLINE)

15:45 – 16:30 SECOND QUANTIZATION OF BANKS
by Christoph Burgard: Head of Risk Analytics For Global Markets, Bank of America Merrill Lynch

16:30 – 17:15 DEEP PRIMAL-DUAL ALGORITHM FOR BSDES: APPLICATION OF MACHINE LEARNING TO CVA AND IM
by Pierre Henry-Labordere: Quant, Global Markets Quantitative Research, Société Générale (To be confirmed)

15:45 – 16:30 SMART DERIVATIVE CONTRACTS (DETACHING TRANSACTIONS FROM COUNTERPARTY CREDIT RISK: SPECIFICATION, PARAMETRISATION, VALUATION)
by Christian Fries: Head of Model Development, DZ Bank

16:30 – 17:15 COMPOSITE AVERAGE OPTION VALUATION WITH SMILES
by Peter Jaeckel: Deputy Head of Quantitative Research, VTB Capital

- The economic purpose of composite options
- Turning a multiplication into a subtraction
- Generic bilinear option valuation: lots of digitals!
- Solid bivariate cumulative normals
- Does it work?

20:00 GALA DINNER - PLAGE BEAU RIVAGE, NICE

MAIN CONFERENCE DAY TWO – FRIDAY 28TH SEPTEMBER

XVA, AAD, MVA & INITIAL MARGIN	MACHINE LEARNING & QUANTUM COMPUTING TECHNIQUES	VOLATILITY & MODELLING TECHNIQUES

08:30 – 09:00 MORNING WELCOME COFFEE

09:00 – 09:45 KEYNOTE: VACSLAV GLUKHOV, PHD

EXECUTIVE DIRECTOR, LINEAR QUANTITATIVE RESEARCH, GLOBAL EQUITIES, J.P. MORGAN (TO BE CONFIRMED)

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

09:45 – 10:30 PANEL: XVA, AAD, INTIAL MARGIN & FRTB

Moderator:

- **Alexandre Antonov:** Director, **Standard Chartered Bank**

Panelists:

- **Andrew Green:** Managing Director and XVA Lead Quant, **Scotiabank**
- **Andrew McClelland:** Director, Quantitative Research, **Numerix**
- **Ignacio Ruiz:** Founder & CEO, **MoCaX Intelligence**
- **Gilles Artaud:** Market and Counterparty Risk, **Credit Agricole-CIB**
- **Assad Bouayoun:** Director, XVA Senior Quant, **Scotiabank**

Topics:

- Initial Margin, a push for more model standardization? Good or bad?
- How do you interpret the regulatory requirements to validate and monitor SIMM, and how would a firm best go about meeting those requirements?
- SIMM relies on counterparts calculating their own sensitivities. Do the panelists foresee that causing any problems meeting requirements or additional costs?
- Discuss Implementing SIMM for Non Cleared Initial Margin Rules
- Explore the interaction between MVA and XVAs:
    - What does MVA mean for XVA overall? Can you simplify the valuation adjustments?
    - Understand the impacts of initial margin, bi-lateral initial margin and MVA on business models
    - Is it possible to ensure transparency of derivative pricing calculation to reduce disputes

XVA & Machine Learning:

- Discuss the existing and potential applications of machine learning in XVA

Discuss the Impact of FRTB on XVA's:

- How will the latest proposed regulations impact CVA calculations
- Review what are the most important factors to take into account when calculating the new CVA
- Calculating & Implementing FRTB CVA. How will it affect banks' internal modelling for counterparty risk and risk management?

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

MAIN CONFERENCE DAY TWO – FRIDAY 28TH SEPTEMBER

XVA, AAD, MVA & INITIAL MARGIN

CHAIR:

MARTIN ENGBLOM: CO-CEO TRICALCULATE, TRIOPTIMA, A NEX GROUP COMPANY

11:00 – 11:45 ACCELERATED MVA IN THE PROBABILITY MATRIX METHOD
by Martin Engblom: Co-CEO triCalculate, TriOptima, a NEX Group Company

- Introduction to the Probability Matrix Method
- Simulating IM using full SIMM and CCP formulas
- Practical examples and benchmarks
- Live demo

11:45 – 12:30 ALGORITHMIC DIFFERENTIATION THROUGH LEAST-SQUARES MONTE CARLO: CVA GREEKS AND MVA FOR CALLABLES
by Andrew McClelland: Director, Quantitative Research, Numerix

- Pathwise methods for CVA Greeks and future value Greeks for MVA both require differentiation of continuation values over model parameters
- When using LSMC, algorithmic differentiation can be applied in reverse mode (CVA) and forward mode (MVA) for efficiency
- Careful inspection of the regression algorithm reveals specific dependencies, namely those of coefficients on contemporaneous states, which vanish as the sample size grows large
- Ignoring these dependencies dramatically simplifies propagation and yields significant reductions in the computational expense with minimal impact on accuracy
- We present a set of illustrative examples involving Bermudan swaptions

MACHINE LEARNING & QUANTUM COMPUTING TECHNIQUES

CHAIR:

TO BE CONFIRMED

11:00 – 11:45 USING MACHINE LEARNING METHODS FOR VOLATILITY TRADING
To be confirmed

- 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

11:45 – 12:30 MVA USING MACHINE LEARNING TECHNIQUES
by Gilles Artaud: Market and Counterparty Risk, Credit Agricole-CIB

- Initial Margin: why and what?
- IM Impacts on pricing (on different valuation adjustments
- Brute force computations; more elaborate techniques: AAD, American Monte Carlo
- How can Machine Learning help?

VOLATILITY & MODELLING TECHNIQUES

CHAIR:

TO BE CONFIRMED

11:00 – 11:45 ON THE JOINT CALIBRATION OF SPX AND VIX OPTIONS
by Julien Guyon: Senior Quant, Bloomberg L.P.

- Past attempts
- New approach for continuous models on the SPX
- The case of instantaneous VIX: Necessary and sufficient condition for joint calibration
- The real case of 30 day VIX: Inversion of convex ordering of VIX2 and local VIX2
- Inversion of convex ordering using fast mean-reverting and highly volatile volatility
- Inversion of convex ordering using rough volatility

11:45 – 12:30 TOPIC AND PRESENTER TO BE CONFIRMED

MAIN CONFERENCE DAY TWO – FRIDAY 28TH SEPTEMBER

XVA, AAD, MVA & INITIAL MARGIN

12:30 – 13:30 LUNCH

13:30 – 14:15 **LOW-MEMORY ALGORITHMIC ADJOINT PROPOAGATION**
by Uwe Naumann, Professor for Computer Science, RWTH AACHEN UNIVERSITY

- Recall: Tape-based algorithmic adjoints
- Low development effort adjoints by taping to disc
- Separation of randomly and sequentially accessed data
- Minimisation of size of randomly accessed data

14:15 – 15:00 **ALGORITHMIC ADJOINT & GPU SOLUTION AND PERFORMANCE FIGURES**
by Andrew Green: Managing Director and XVA Lead Quant, Scotiabank

MACHINE LEARNING & QUANTUM COMPUTING TECHNIQUES

13:30 – 14:15 **VECTORISED APPROACH TO TREE-BASED MACHINE LEARNING PROBLEMS**
by Jan Novotny: eFX Quant, Global Banking and Markets, HSBC

14:15 – 15:00 **INDUSTRY BREAKTHROUGHS IN QUANTUM COMPUTING**
by Alexei Kondratyev: Managing Director, Head of Prime Services Analytics, Standard Chartered Bank & Davide Venturelli: Quantum Computing Lead, NASA-USRA Quantum AI Lab (To be confirmed)

An inside glimpse into how quantum computing is starting to be applied to finance

VOLATILITY & MODELLING TECHNIQUES

13:30 – 14:15 **OPTIMAL INVESTMENT**
by Vladimir Piterbarg

14:15 – 15:00 **"SMILE MODELLING IN COMMODITY MARKETS"**
by Andrea Pallavicini: Head of Equity, FX and Commodity models, BANCA IMI

- Derivatives on Commodity Futures
- Fast Calibration of Future Option Smile
- Forward Curve and Volatility Smile Dynamics
- Numerical Investigations in Realistic Settings

15:00 – 15:15 **AFTERNOON BREAK AND NETWORKING OPPORTUNITIES**

15:15 – 16:00 **CLOSING PRESENTATION: MASSIMO MORINI:**
HEAD OF INTEREST RATE AND CREDIT MODELS, GRUPPO INTESA SANPAOLO

EXAMINING REAL POSSIBILITIES AND APPLICATIONS OF DISTRIBUTED LEDGER TECHNOLOGIES

- Which applications are game changing for finance and why?

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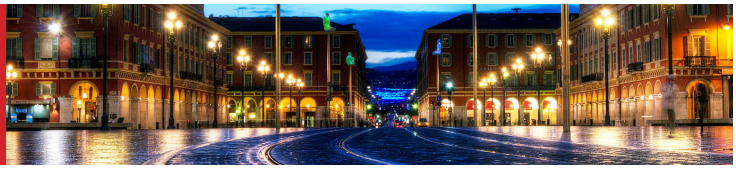

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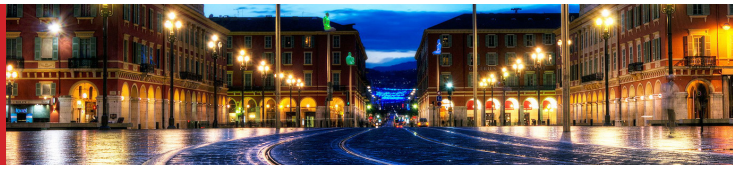

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