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We certify that **Abel Guada Azze** participated in and delivered the talk entitled **“Optimal stopping of Gauss-Markov bridges with applications to American options”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Adil Rengim Cetingoz** participated in and delivered the talk entitled **“Factor Risk Budgeting and Beyond”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Albina Danilova** participated in and delivered the talk entitled **“Order routing and market quality: Who benefits from internalization?”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Aldair Petronilia** participated in and delivered the talk entitled **"Contagious McKeanVlasov problems with common noise: from smooth to singular feedback through hitting times"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8^{th} to July 12^{th}, 2024.

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We certify that **Alekos Cecchin** participated in and delivered the talk entitled **“On the long time behavior of mean field games”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Alessandro Bondi** participated in and delivered the talk entitled **“Affine Volterra processes with jumps”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Alessandro Doldi** participated in and delivered the talk entitled **"On stability of law-invariant risk measures and EOT problems"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Alessandro Sgarabottolo** participated in and delivered the talk entitled **“Risk measures based on weak optimal transport”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Alexander Voss** participated in and delivered the talk entitled **“Towards a Measurement of Cyber Pandemic Risk”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Alexandros Saplaouras** participated in and delivered the talk entitled **"Stability of backward propagation of chaos"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Anastasis Kratsios** participated in and delivered the talk entitled **“An Approximation Theory for Metric Space-Valued Functions: From Rough Path Theory to Adapted Optimal Transport”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Anders Midtgaard Norlyk** participated in and delivered the talk entitled **“The Stochastic Block Ornstein Uhlenbeck Process”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Andrea Mazzon** participated in and delivered the talk entitled “**Optimal entry and exit problems under climate scenario uncertainty, ambiguity aversion and learning**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Andreas Andrikopoulos** participated in and delivered the talk entitled **"Pay for success contracts: Investment valuation in partially complete markets"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Andreas Celary** participated in and delivered the talk entitled **“Reproducing Kernel Based Methods For Modelling The Discount Curve”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Andreas Sojmark** participated in and delivered the talk entitled **“Endogenous distress contagion in dynamic interbank systems”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Anna Paula Kwossek** participated in and delivered the talk entitled **“Pathwise stability analysis: Euler schemes and log-optimal portfolios”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8^{th} to July 12^{th}, 2024.

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We certify that **Antonio Marini** participated in and delivered the talk entitled **“Calibration of the Bass Local Volatility Model”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8^{th} to July 12^{th}, 2024.

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We certify that **Antonis Papapantoleon** participated in and delivered the talk entitled **“Deep gradient flow methods for option pricing in (rough) diffusion models”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Ariel Neufeld** participated in and delivered the talk entitled "**Quantum Monte Carlo algorithm for solving Black-Scholes PDEs for high-dimensional option pricing in finance and its proof of overcoming the curse of dimensionality**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Ariel Neufeld** participated in and delivered the talk entitled **"Sensitivity of robust optimization problems under drift and volatility uncertainty"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Asmerilda Hitaj** participated in and delivered the talk entitled "**ALM Through Distributionally Robust Optimization**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Bahman Angoshtari** participated in and delivered the talk entitled **“Optimal consumption under loss-averse multiplicative habit-formation preferences”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Balint Negyesi** participated in and delivered the talk entitled **"Convergence of the Deep BSDE method for general coupled FBSDEs and applications in stochastic optimal control"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Bart Taub** participated in and delivered the talk entitled **"The value of information flows in the stock market"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Beatrice Ongarato** participated in and delivered the talk entitled **“Semi-static variance-optimal hedging with self-exciting jumps”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Benedict Bauer** participated in and delivered the talk entitled **“Martingale bridges with restricted support”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Bruno Dupire** participated in and delivered the talk entitled **“An Order Matching Engine to Trade Multiple Securities Simultaneously”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Camilo Hernández** participated in and delivered the talk entitled **"Moral Hazard for Time-Inconsistent Agents"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Caroline Hillairet** participated in and delivered the talk entitled **"Bi-Revealed Utilities in a defaultable universe"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Cecilia Mancini** participated in and delivered the talk entitled **"Optimum thresholding using conditional mean squared error in the presence of infinite activity jumps"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Chiara Rossato** participated in and delivered the talk entitled **"Golden parachutes under the threat of accidents"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Christoph Reisinger** participated in and delivered the talk entitled **"Markov decision processes with observation costs"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Connor Tracy** participated in and delivered the talk entitled **“Stochastic Liquidity as Proxy for Nonlinear Cross Impact”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Cristiano Arbex Valle** participated in and delivered the talk entitled **“An optimisation framework for building realistic portfolios with equities and futures contracts”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Daniel Krsek** participated in and delivered the talk entitled “**Randomisation with moral hazard: a path to existence of optimal contracts**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8^{th} to July 12^{th}, 2024.

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We certify that **David Hirnschall** participated in and delivered the talk entitled **"Signature-based Time Series Wasserstein GAN"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **David Itkin** participated in and delivered the talk entitled **“Optimal Linear Strategies under Concave Price Impact”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Dimitrios Konstantinides** participated in and delivered the talk entitled **“A new approach in two-dimensional heavy-tailed random variables”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Diogo Duarte Garcia Pires** participated in and delivered the talk entitled **"Bank Liquidity Management and Payout Policy under Peer Pressure"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Diogo Gomes** participated in and delivered the talk entitled **"A Mean-Field Game Model of Price Formation with Price-Dependent Agent Behavior"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8^{th} to July 12^{th}, 2024.

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We certify that **Dominykas Norgilas** participated in and delivered the talk entitled **“Numerics of Martingale Optimal Transport with Causality Constraints”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Dörte Kreher** participated in and delivered the talk entitled **"Interacting limit order markets"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Duong Van Hai** participated in and delivered the talk entitled **“Does spoofing erode market confidence?”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8^{th} to July 12^{th}, 2024.

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We certify that **Dylan Possamai** participated in and delivered the talk entitled **“Randomness and early termination: what makes a game exciting?”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8^{th} to July 12^{th}, 2024.

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We certify that **Eduardo Abi Jaber** participated in and delivered the talk entitled **"Equilibrium in Functional Stochastic Games with Mean-Field Interaction"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Eduardo Fonseca Mendes** participated in and delivered the talk entitled **“Parametric portfolio policy, transaction costs and regularization”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Eliana Fausti** participated in and delivered the talk entitled **"From mean field modelling to a forward-looking indicator of systemic risk"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Elisa Mastrogiacomo** participated in and delivered the talk entitled **“Dynamic capital allocation rules via BSDEs: an axiomatic approach”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Emma Hubert** participated in and delivered the talk entitled **“A new approach to principalagent problems with volatility control”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Emmanuel Lepinette** participated in and delivered the talk entitled **"Alternative approach to price European options in general discrete-time models without no-arbitrage condition."** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Evangelia Dragazi** participated in and delivered the talk entitled **“Improved model-free bounds for multi-asset options using option-implied information and deep learning”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Eyal Neuman** participated in and delivered the talk entitled **“Offline learning for propagator models”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Fabian Fuchs** participated in and delivered the talk entitled **"A comparison principle for Hamilton-Jacobi-Bellman-Isaacs equations based on couplings of differential opera- tors"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Fabrice Wunderlich** participated in and delivered the talk entitled **“Functional weak convergence of financial gains for tick-by-tick models”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Faycal Drissi** participated in and delivered the talk entitled “**Price formation and competition in decentralised exchanges**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8^{th} to July 12^{th}, 2024.

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We certify that **Fenghui Yu** participated in and delivered the talk entitled **“A queueing approach to execution probabilities in a limit order book with stochastic order flows”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Florian Bourgey** participated in and delivered the talk entitled **"Smile Dynamics and Rough Volatility"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Florian Thomas Krach** participated in and delivered the talk entitled **“Forecasting LOBs with Path-Dependent Neural Jump ODEs”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Francesca Primavera** participated in and delivered the talk entitled **"Itô's formula for non-anticipative functionals of càdlàg rough paths"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Francis Liu** participated in and delivered the talk entitled **"Jump risk premia in the presence of clustered jumps"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Franklin de Oliveira Gonçalves** participated in and delivered the talk entitled **"Quant Models, Systematic Investments and Risk Management"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Gabriela Kovacova** participated in and delivered the talk entitled **“Robust multi-objective stochastic control”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Gabriele Visentin** participated in and delivered the talk entitled **“Calibration to market-implied risk measures”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Giacomo Lanaro** participated in and delivered the talk entitled “**Price formation under asymmetry of information – a mean-field approach**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Gijs Mast** participated in and delivered the talk entitled **"A novel Fourier tensor network for solving multi-dimensional expectation problems"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Giulia Di Nunno** participated in and delivered the talk entitled **"A tour in Sandwiched Volterra Volatility models"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Graeme Baker** participated in and delivered the talk entitled “**Two approaches to mean-field systemic risk models with default cascades**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Guido Gazzani** participated in and delivered the talk entitled **“Joint calibration to SPX and VIX options with signature-based models”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Hamza Bodor** participated in and delivered the talk entitled **"A Novel Approach to Queue-Reactive Models: The Importance of Order Sizes"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Hao Xing** participated in and delivered the talk entitled **“Model Ambiguity versus Model Misspecification in Dynamic Portfolio Choice”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Hao Xing** participated in and delivered the talk entitled **“Optimal contract, consumption habit, and capital structure”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Haoyang Cao** participated in and delivered the talk entitled **"Risk of transfer learning and its applications in finance"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8^{th} to July 12^{th}, 2024.

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We certify that **Hassan Chehaitli** participated in and delivered the talk entitled “**Netting And Novation In Repo Networks With Rehypothecation: An Agent-Based Computational Model**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Heidar Eyjolfsson** participated in and delivered the talk entitled **"Robustness of Hilbert space-valued stochastic volatility models"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Hélène Halconruy** participated in and delivered the talk entitled **"On a projection least squares estimator for jump diffusion processes"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Helton Graziadei de Carvalho** participated in and delivered the talk entitled **"Actuarial Learning for Loss Modeling of Brazilian Soybean Crops"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Ioannis Gasteratos** participated in and delivered the talk entitled **“okker-Planck equations for Volterra processes”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Ioannis Kyriakou** participated in and delivered the talk entitled **“Calibration risk under parameter probabilistic dependencies and model output effects”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8^{th} to July 12^{th}, 2024.

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We certify that **Jaehyuk Choi** participated in and delivered the talk entitled **"Efficient simulation of the SABR model"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Jakob Heiss** participated in and delivered the talk entitled **“Path-dependent Neural Jump ODEs and their Application to Stochastic Filtering”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **James Dalby** participated in and delivered the talk entitled **"Collectivized pensions in the presence of systematic longevity risk"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Jan Obloj** participated in and delivered the talk entitled "**Martingale Benamou-Brenier: arithmetic and geometric Bass martingales**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Jan Vecer** participated in and delivered the talk entitled **"Portfolio Optimization Beyond Utility Maximization: The Case of Driftless Markets"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Jang Schiltz** participated in and delivered the talk entitled "**Finite Mixture Models for an underlying Beta distribution with an application to COVID-19 data**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Janka Oona Möller** participated in and delivered the talk entitled **“Polynomial and affine McKean-Vlasov stochastic differential equations”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Jasper Rou** participated in and delivered the talk entitled **“Convergence of Deep Gradient Flow Methods for Option Pricing”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Javier Garcia Gonzalez** participated in and delivered the talk entitled **“Welfare effects of collective investment for heterogeneous agents”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Jim Gatheral** participated in and delivered the talk entitled **“Computing the SSR”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **João Afonso Bastos** participated in and delivered the talk entitled "**Nonparametric determinants of market liquidity**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Jodi Dianetti** participated in and delivered the talk entitled “**Strong solutions to submodular mean field games with common noise under lack of uniqueness**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Johannes Langner** participated in and delivered the talk entitled **“Mean-field equilibrium under model uncertainty”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Johannes Wiesel** participated in and delivered the talk entitled “**Empirical martingale projections via the smoothed adapted Wasserstein distance**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **John Armstrong** participated in and delivered the talk entitled **“Robustness of the Gamma Hedging Strategy”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Jonathan Yick Yeung Tam** participated in and delivered the talk entitled **“Mean-field games of speedy information access with observation costs”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Jorge P. Zubelli** participated in and delivered the talk entitled “**Deep reinforcement learning for stochastic dominance problems with applications to optimal fixed mix strategies**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Josef Teichmann** participated in and delivered the talk entitled **“Is it easier to learn robust optimal investment strategies?”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Joseph Mulligan** participated in and delivered the talk entitled **“On the Perils of Overfitting”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Juan Carlos Arismendi Zambrano** participated in and delivered the talk entitled **“Implicit Entropic Market Risk-Premium from Interest Rate Derivatives”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8^{th} to July 12^{th}, 2024.

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We certify that **Julien Guyon** participated in and delivered the talk entitled “**Fast Exact Joint S&P 500/VIX Smile Calibration in Discrete and Continuous Time**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Julio Backhoff-Veraguas** participated in and delivered the talk entitled **“Specific relative entropy between continuous martingales and applications”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Justin Gwee** participated in and delivered the talk entitled **"The explicit solution to a risk-sensitive ergodic singular stochastic control problem"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Kaiwen Zhang** participated in and delivered the talk entitled **"A Probabilistic Approach to Discounted Infinite Horizon and Invariant Mean Field Games"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Karoline Vonach** participated in and delivered the talk entitled **“On the Matrix-Valued Gamma Distribution in Multivariate Poisson Mixture Models”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Katharina Oberpriller** participated in and delivered the talk entitled **“Robust asymptotic insurance-finance arbitrage”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Kevin Weichao Lu** participated in and delivered the talk entitled "**Monte Carlo Simulation for Trading Under a Lévy-Driven Mean-Reverting Framework**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Kexin Shao** participated in and delivered the talk entitled **“Non-decreasing martingale couplings”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Konstantinos Stefanakis** participated in and delivered the talk entitled **“Equilibrium Returns in Continuous-Time Markets with Price Impact and Frictions”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Kristof Wiedermann** participated in and delivered the talk entitled **“A small-time central limit theorem for stochastic Volterra integral equations and its implications on the Markov property”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Kumushoy Abduraimova** participated in and delivered the talk entitled **"Contagion in high-frequency (il)liquidity networks"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Laura Ballotta** participated in and delivered the talk entitled **“Time changes, Fourier transforms and the joint calibration to the S&P 500/VIX smiles”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Laurence Carassus** participated in and delivered the talk entitled “**Nonconcave Robust Utility Maximization under Projective Determinacy**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Leonardo Perotti** participated in and delivered the talk entitled **"From P to Q: Robust Hedging of the Prepayment Option"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Lingyi Yang** participated in and delivered the talk entitled **"Modelling with signature neural processes"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Linn Engström** participated in and delivered the talk entitled **"Computation of Robust Option Prices via Structured Martingale Optimal Transport"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Lionel Sopgoui** participated in and delivered the talk entitled **“Propagation of carbon taxes in credit portfolio through macroeconomic factors”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Lorenz Riess** participated in and delivered the talk entitled **"The CLM-transformation for weak Martingale Optimal Transport"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Lorenzo Lucchese** participated in and delivered the talk entitled **“The Short-Term Predictability of Returns in Order Book Markets: a Deep Learning Perspective”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Lorenzo Mercuri** participated in and delivered the talk entitled **“A local jump compound CARMA(p,q)-Hawkes process.”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Louis-Amand Gérard** participated in and delivered the talk entitled **"Signature stochastic volatility models: pricing and hedging with Fourier"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Luca De Gennaro Aquino** participated in and delivered the talk entitled **“Reference-dependent asset pricing with a stochastic consumption-dividend ratio”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Luciana Salles Barbosa** participated in and delivered the talk entitled **“Strategic investment and subsidy within an asymmetric duopoly under uncertainty”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Luciano Campi** participated in and delivered the talk entitled **“Coarse correlated equilibria in linear quadratic mean field games and application to an emission abatement game”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Luhao Zhang** participated in and delivered the talk entitled **“Decision Making under Costly Sequential Information Acquisition: the Paradigm of Reversible and Irreversible Decisions”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Lukas Trottner** participated in and delivered the talk entitled **"Learning to reflect On data driven approaches to stochastic control"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Marcel Nutz** participated in and delivered the talk entitled **“Entropic Selection in Optimal Transport”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Marco Frittelli** participated in and delivered the talk entitled **"Collective super replication and collective risk measures"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Marco Rodrigues** participated in and delivered the talk entitled **"Reflections on BSDEs"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8^{th} to July 12^{th}, 2024.

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We certify that **Marco Zullino** participated in and delivered the talk entitled "**Dynamic Return and Star-Shaped Risk Measures via BSDEs**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Maria Olympia Tsianni** participated in and delivered the talk entitled **“Simulation of the Calibrated Heston-type Local Stochastic Volatility Model”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Mark Podolskij** participated in and delivered the talk entitled "**On nonparametric estimation of the interaction function in particle system models**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Marlon Ruoso Moresco** participated in and delivered the talk entitled **“Uncertainty Propagation and Dynamic Robust Risk Measures”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8^{th} to July 12^{th}, 2024.

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We certify that **Mateo Rodriguez Polo** participated in and delivered the talk entitled **“Time-inconsistent stochastic control: state dependency”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Mehdi Talbi** participated in and delivered the talk entitled **“Sannikovs contracting problem with many Agents”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Mesias Alfeus** participated in and delivered the talk entitled "**Roll-Over Risk: New Evidence from an Emerging Market**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Mesias Alfeus** participated in and delivered the talk entitled **“Consistent Joint Modeling of SPX Options, VIX Options, and VIX Futures”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Michael Giegrich** participated in and delivered the talk entitled **“K-nearest neighbor resampling for limit order books”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Moritz Voss** participated in and delivered the talk entitled **“Aggregation of Financial Markets”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Moritz Weiss** participated in and delivered the talk entitled **"Reinforcement Learning for Trade Execution in a Simulated Market"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Natalie Packham** participated in and delivered the talk entitled **“A Markov approach to credit rating migration conditional on economic states”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Nathan De Carvalho** participated in and delivered the talk entitled “**Optimal trading with propagators and inventory constraints: applications to battery storage and execution**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Nathan De Carvalho** participated in and delivered the talk entitled **"Reconciling rough volatility with jumps"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Nazem Khan** participated in and delivered the talk entitled **“Chain or Channel? Channel Optimization with Heterogeneous Payments”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Nelson Kyakutwika** participated in and delivered the talk entitled **“Consistent Joint Modeling of SPX Options, VIX Options, and VIX Futures”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Neofytos Rodosthenous** participated in and delivered the talk entitled **“Uncertainty over uncertainty in environmental policy adoption: Bayesian learning of unpredictable socioeco- nomic costs”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Nicolás Hernández Santibáñez** participated in and delivered the talk entitled **“Dynamic programming approach for continuous-time Stackelberg games”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Nikolaos Constantinou** participated in and delivered the talk entitled **“Equilibria in incomplete markets an FBSDE approach”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Nikolay Gudkov** participated in and delivered the talk entitled **"Empirical Analysis of Crude Oil Dynamics Using Affine vs. Non-affine Jump-Diffusion Models"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Nurtai Meimanjan** participated in and delivered the talk entitled **“A mixed-integer programming approach in computation of systemic risk measures”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Ofelia Bonesini** participated in and delivered the talk entitled “**Continuous time persuasion with filtering and applications to energy transition**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Oleksii Mostovyi** participated in and delivered the talk entitled **"An approach to the Greeks for indifference pricing"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Oriol Zamora Font** participated in and delivered the talk entitled **“Pricing VIX options under the Heston-Hawkes stochastic volatility model”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Osvaldo Paulo Israel Cancado Assuncao** participated in and delivered the talk entitled **“Common Asset Impact on Default Contagion”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Paul Hager** participated in and delivered the talk entitled “**Advancing Optimal Stochastic Control with Signatures**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Pere Diaz Lozano** participated in and delivered the talk entitled **“Computing dynamic risk measures: Convergence of the Deep BSDE method for FBSDE with quadratic growth”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Peter Pommergård Lind** participated in and delivered the talk entitled “**NN de-Americanization: A Fast and Efficient Calibration Method for American-Style Options**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Pham Huyen** participated in and delivered the talk entitled “**Control randomisation approach for policy gradient and application to reinforcement learning in optimal switching**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Philipp Jettkant** participated in and delivered the talk entitled **“The Memoryless Property in a Mean-Field Systemic Risk Model with Defaults”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Philipp Schmocker** participated in and delivered the talk entitled **“Universal Approximation Property of Random Neural Networks”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Philippe Bergault** participated in and delivered the talk entitled **"A mean field game between informed traders and a broker"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Piotr Fiszeder** participated in and delivered the talk entitled **"Drivers of Bitcoin volatility: A Comprehensive Study with Statistical and Machine Learning Methods"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Rafael Berriel** participated in and delivered the talk entitled **"Optimal Investment Time under Moral Hazard"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Raquel Maria Medeiros Gaspar** participated in and delivered the talk entitled **“Nonparametric option hedging”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Raul Guarani Riva** participated in and delivered the talk entitled **“Asymmetric Violations of the Spanning Hypothesis”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Redouane Silvente** participated in and delivered the talk entitled **“Optimal control of storage and intraday price formation in electricity markets”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Rene Aid** participated in and delivered the talk entitled **“Moral hazard, market power and futures market equilibrium”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Robert Boyce** participated in and delivered the talk entitled **"Unwinding Stochastic Order Flow with Partial Information"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Robert Denkert** participated in and delivered the talk entitled "**Extended mean-field games with multi-dimensional singular controls**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Rodrigo S. Targino** participated in and delivered the talk entitled “**Mortality Forecasting of Small Pension Fund Population with Gaussian Processes in a Sub Population Framework**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Rouyi Zhang** participated in and delivered the talk entitled "**Convergence of Heavy-Tailed Hawkes Processes and the Microstructure of Rough Volatility**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Roxana Dumitrescu** participated in and delivered the talk entitled **"Energy efficiency and demand response: a mean-field game approach."** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Ruben Wiedemann** participated in and delivered the talk entitled **“Local Volatility Calibration Using Neural Operators”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Ruediger Frey** participated in and delivered the talk entitled “**On the impact of tax uncertainty on investment into carbon abatement technologies**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Samuel Cohen** participated in and delivered the talk entitled **“Neural network pricing models with implications for hedging and risk management”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Sascha Desmettre** participated in and delivered the talk entitled **"Equilibrium Investment with Random Risk Aversion"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Nathan Sauldubois** participated in and delivered the talk entitled **"First order Martingale model risk hedging"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Scott Robertson** participated in and delivered the talk entitled **“Rational Expectations Equilibrium with Optimal Information Acquisition”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Sebastian Bak Egebjerg** participated in and delivered the talk entitled **“A model for the hedging impact of option market makers”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Sebastian Jaimungal** participated in and delivered the talk entitled **"Constrained Barycentre of Models with Deep Learning"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Sergio Maffra** participated in and delivered the talk entitled **“Cashflow-driven investment beyond expectations”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Shida Duan** participated in and delivered the talk entitled **“Rank-Dependent Predictable Forward Performance Processes”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Shuaijie Qian** participated in and delivered the talk entitled "**Non-Concave Utility Maximization with Transaction Costs**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Song Ping Zhu** participated in and delivered the talk entitled **"Price equivalence between Parasian options with a moving window and their "fixed window" counterparts"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Songyan Hou** participated in and delivered the talk entitled **“Time-Causal Market Generator”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Stephan Sturm** participated in and delivered the talk entitled **“The Distribution Builder – A tool for financial decision making in the FinTech era”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Steven Campbell** participated in and delivered the talk entitled **"Relative Arbitrage Under Transaction Costs"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Sturmius Tuschmann** participated in and delivered the talk entitled **“Optimal Portfolio Choice with Cross-Impact Propagators”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Tahir Choulli** participated in and delivered the talk entitled **“Super-hedging-pricing for vulnerable claims in market models with random horizon”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Thaleia Zariphopoulou** participated in and delivered the talk entitled **“Information acquisition via a consequentialistic approach under model uncertainty”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Thibaut Mastrolia** participated in and delivered the talk entitled **"Auction market design and regulation policies"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Thilo Meyer-Brandis** participated in and delivered the talk entitled **"Collective Arbitrage"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Thomas Kirkegaard Kloster** participated in and delivered the talk entitled **"Orthogonal expansions in Volterra-Heston models"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Thorsten Schmidt** participated in and delivered the talk entitled **“Term structure modelling with overnight rates beyond stochastic continuity”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Urban Ulrych** participated in and delivered the talk entitled **“Smart Kernel Factors”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Uwe Schmock** participated in and delivered the talk entitled **“Equivalent Conditions for the Stochastic Exponential to be a Uniformly Integrable Martingale”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Valentin Tissot Daguette** participated in and delivered the talk entitled **"Occupied Processes: Going with the Flow"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Vinicius Albani** participated in and delivered the talk entitled **“Combining Stochastic Modeling and Artificial Intelligence to Price Electricity Forward Contracts”** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Vitali Alexeev** participated in and delivered the talk entitled **"From previous tick to pre-averaging: A Spectrum of equidistant transformations for unevenly spaced high- frequency data"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Vu Huy Hoang** participated in and delivered the talk entitled **"Macro-Finance Models: A Mean-field Game Approach"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Wenpin Tang** participated in and delivered the talk entitled “**Contractive diffusion models and score matching by continuous reinforcement learning**” at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Xiaofei Shi** participated in and delivered the talk entitled **"Dynamic Portfolio Choice with Intertemporal Hedging and Transaction Costs"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Xiaoping Lu** participated in and delivered the talk entitled "**Pricing American Barrier Options with Transaction Costs**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Yadh Hafsi** participated in and delivered the talk entitled **"Uncovering Market Disorder and Liquidity Trends Detection"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Yifan Jiang** participated in and delivered the talk entitled **"Sensitivity of causal distributionally robust optimization"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Yonatan Shadmi** participated in and delivered the talk entitled "**Stability of order routing systems in fragmented markets**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8^{th} to July 12^{th}, 2024.

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We certify that **Yufei Zhang** participated in and delivered the talk entitled "**Fast and Slow Optimal Trading with Exogenous Information**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Yuqiong Wang** participated in and delivered the talk entitled **"Bayesian dynamic Pricing under an arbitrary prior"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Zhaoli Jiang** participated in and delivered the talk entitled "**Strategic Investment under Uncertainty with First- and Second-mover Advantages**" at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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We certify that **Ziteng Cheng** participated in and delivered the talk entitled **"Mean field regrets in discrete time games"** at the **12th Bachelier World Congress of the Bachelier Finance Society** held at Escola de Matemática Aplicada of Fundação Getulio Vargas - FGV EMAp, Rio de Janeiro, from July 8th to July 12th, 2024.

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