

GEOFFREY DUCOURNAU, PhD

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PERSONAL PROFILE

Lead R&D Engineer & AI Architect at Dimtech, working at the intersection of research and engineering. I focus on the full lifecycle of a solution: from designing core algorithms to building the systems that keep them running in production.

Concurrently, I maintain academic ties as **Research Affiliate** at Tsinghua University (China) and as co-supervisor of Rémi Collin's CIFRE doctoral program at the University of Nîmes (advisor: Prof. Stéphane Mussard).

EDUCATION

Postdoctoral Research Fellow in Finance, Tsinghua University	2022 – 2024
Ph.D Visiting Student Researcher, Sorbonne University	2020 – 2021
Doctor of Philosophy in Statistical Finance, Montpellier University	2018 – 2021
MSc in Aerospace Engineering, EIGSI – ISAE Group (Grande École)	2013 – 2016
BSc in Mathematics, French CPGE – MPSI/PSI, Lycée Militaire d'Aix-en-Provence	2011 – 2013

CORE EXPERTISE

- Quantitative R&D:** Market-making algorithms, trading signal generation, and systematic strategy development—converting theoretical alpha into production-grade trading systems.
- Systems Engineering:** End-to-end pipeline delivery from Data Collection → Algorithm Design → Infrastructure (AWS/Azure/On-Prem) → Deployment (DevOps/MLOps).
- AI Architecture:** Design of enterprise AI systems with multi-layered RAG pipelines, hybrid LLM routing, and on-premise deployment for data privacy.

PROFESSIONAL EXPERIENCE

Head of Research & Development 2024 – Present
Dimtech Ltd, Tianjin & Paris

As the company expanded into automation, digitalization, and AI solutions, my role evolved beyond quantitative investment to leading the full Research and Engineering production, managing a team of 5 researchers building data-driven AI for financial institutions.

I led several key projects including a multi-layered RAG AI pipeline for Treasury Middle Office at **Doha Bank** (on-premise LLMs, 100% data privacy), an AI Vision system for automated drought damage assessment at **Eurexo-CED Group** using YOLO and SAM3 distillation, and an end-to-end market making algorithm for **The Group Securities** on Qatar Stock Exchange with real-time microstructure response and clean inventory management.

Quantitative Strategist 2021 – 2024
Dimtech Ltd, Tianjin & Paris

Led the development and implementation of systematic trading strategies, from research and backtesting to production deployment. Managed CTA (Commodity Trading Advisor) strategies on behalf of the company for several institutional clients, including Qube Research & Technologies and Bainbridge Partners LLP.

Primary responsibility was developing systems to automate the integration of client trading desks into our infrastructure, enabling efficient delivery of trading signals with minimal latency and zero failover.

Quantitative Researcher – PhD Candidate (CIFRE) 2018 – 2021
Dimtech Ltd, Tianjin & Paris

Industrial PhD (CIFRE) focusing on market microstructure theory and stochastic processes for quantitative trading applications. Research centered on realized volatility estimation under microstructure noise, optimal execution strategies, and signal processing through efficient volatility modeling. Developed statistical frameworks for high-frequency data analysis, including point process models for order flow dynamics and price impact estimation.

Investment Banking Analyst

2016 – 2018

Hywin Financial Holding Group, Ltd, Shanghai

- Full-cycle M&A participation: acquisition of top 3 French tourism company (debt & equity investment)
- Integration planning and post-closing deal execution

ACADEMIC EMPLOYMENT

Research Affiliate

2025 – Present

School of Economics & Management, Tsinghua University, Beijing

- Collaborative research with Prof. Jinliang Li in market microstructure and complex systems using limit-order book reconstruction and agent-based modeling
- Developed multiplex graph neural networks for cross-market contagion dynamics and systemic risk propagation
- Mentored Dr. He Liu (postdoctoral researcher) in experimental design and statistical methodology

Postdoctoral Research Fellow

2022 – 2024

School of Economics & Management, Tsinghua University, Beijing

- Research: Political shocks in developed economies using quasi-natural experimental methods
- Themes: Event-study with heterogeneous treatment, behavioral finance, control theory

Associate Researcher

2022 – 2023

HKU Business School, The University of Hong Kong

- Research project design, PhD student supervision, faculty collaboration

SELECTED CONFERENCES & SEMINARS

- 2024 37th Australasian Finance and Banking Conference (AFBC2024), The University of Sydney Business School
- 2024 World Financial Conference (WFC2024), European University Cyprus
- 2024 World Finance & Banking Symposium (WFBS2024), Abu Dhabi School of Management
- 2023 Sydney Banking and Financial Stability Conference (SBFC2023), The University of Sydney Business School
- 39th International Conference of the French Finance Association (AFFI), Bordeaux, Kedge Business School
- 2023 Asian Meeting of the Economic Society (AMES), Nanyang Technological University (NTU) Singapore
- 2023 Asian Finance Association Conference (FA), University of Economics, Ho Chi Minh
- 2023 Seminar at Zhejiang University, Zhejiang University of Finance & Economics, and Central University of Finance and Economics. Yousha Liang, Yuan Ren, Qi Xu, Zilong Zhang, Yueteng Zhu, the audience.
- 2023 Annual Research Seminar (EcoFi) at Paris Business School, Department of Economic and Finance. Hassan Obeid, Nabila Boukef, Daniel Melhem, Serap Atan, and Khaled Guesmi, the audience.

SELECTED FUNDED/AWARDS

- ANRT/CIFRE Program Grant: Doctoral research funding from the French Ministry of Higher Education, Research, and Innovation (MESRI), 2025 - 2028.
- ANRT/CIFRE Program Grant: Doctoral research funding from the French Ministry of Higher Education, Research, and Innovation (MESRI), 2018 - 2021.
- AGEFI Grant: Laureate of the French innovative quantitative researcher, 2018

PUBLICATIONS

- [1] **Ducournau, G.**, Li, J., Li, Y., Wang, Z., Yin, Q. E. (2024). The impact of short selling disclosure regulatory constraints on the lending market and stock ownership. *Journal of Modern Accounting and Auditing*, 20(3), 99-114.
- [2] **Ducournau, G.**, Melhem, D. (2023). Bayesian statistical inference applied to the theory of share price dynamics. *Economics Bulletin*, 44(1), 373-398.

WORKING PAPERS

- [w1] **Ducournau G.**, Wang Y., Jaffal B., Yakoubi D., A Navier-Stokes Framework for Market Microstructure **2026**.
- [w2] **Ducournau G.**, Wang Y., Market Efficiency as a Spectrum: An Information-Theoretic Framework and Event-Based Evidence (Dimtech research collaboration) **2025**.
- [w3] Elage A., Haddad C., **Ducournau G.**, Driving Corporate Competitiveness through Environmental Innovation: The Moderating Role of Corporate Governance in Global Firms **2025**.
- [w4] Elage A., **Ducournau G.**, Li J., Does Corporate Governance Code Matter? **2025**.
- [w5] **Ducournau G.**, Li J., Li Y., Wang Z., Yin Q.E, Does Market Transparency Keep the Bear Asleep? Implications of Short Selling Disclosure on the Lending Market and Corporate Behaviors **2024-25**.
- [w6] **Ducournau G.**, Elage A., Li J., Li Y., Does Corporate Governance Code Matter? **2024-25**.
- [w7] **Ducournau G.**, Li J., Li Y., Wang Z., Yin Q.E, Assessing the Feasibility of a Nuclear-Free Green Energy Transition in Europe **2023**.
- [w8] **Ducournau G.**, Li J., Li Y., Wang Z., Yin Q.E, Assessing the Financial Implications of Nuclear Phase-out Policy: Evidence from European Firms **2023**.
- [w9] **Ducournau G.**, Li J., Li Y., Wang Z., Yin Q.E, The Impact of Legalizing Recreational Tetrahydrocannabinol on Labor Cognition, Firm Performance, and Innovation: Evidence from North America **2022**.
- [w10] **Ducournau G.**, Li J., Li Y., Wang Z., Yin Q.E, The Social and Business Impacts of DRUGS: Drug-consumption Rooms Under Government Supervision. **2022**.
- [w11] **Ducournau G.**, Bayesian Inference and superstatistics to describe long memory processes of financial time series, Cornell University, arXiv:2105.04171, Quantitative Finance [q-fin.CP], May **2021**.
- [w12] **Ducournau G.**, Symbol Dynamics, Information Theory and Complexity of Economic time series, Cornell University, arXiv:2105.04131, Quantitative Finance [q-fin.CP], May **2021**
- [w13] **Ducournau G.**, Statistical mechanics and Bayesian Inference addressed to the Osborne Paradox, Cornell University, arXiv:2103.00788, Quantitative Finance [q-fin.CP], March **2021**
- [w14] **Ducournau G.**, Stock market's physical properties description based on Stokes' Law, Cornell University, arXiv:2103.00721, Quantitative Finance [q-fin.CP], March **2021**.
- [w15] **Ducournau G.**, Modeling the dynamism of the mean equation of returns of Vasicek equation through the first-order Ikeda time delay dynamic system, Montpellier University, arXiv: WP-MRE 2020.78, **2020**

TECHNICAL SKILLS

Languages	Python (primary), Go, TypeScript/React, SQL
Frameworks	FastAPI, NumPy, SciPy, pandas, scikit-learn, PyTorch
Databases	PostgreSQL, MongoDB, Neo4j, Redis, FalkorDB
Infrastructure	Docker, Kubernetes, Linux, Tailscale VPN, HashiCorp Vault
MLOps	MLflow, CI/CD pipelines, model deployment, monitoring
Cloud	AWS (EC2/Lambda/RDS), Azure (VM/ML Studio), Proxmox
Data Sources	WRDS Compustat, Bloomberg, Capital IQ, S&P Global, Sentinel/Copernicus
Statistical	Stata, R