

Joint-PhD Position on Advancing Machine Learning Methods for High-Frequency Financial Time-Series Data

Introduction

Are you passionate about using advanced machine learning techniques to solve real-world problems in financial trading? Do you enjoy working with high-frequency data and building robust, data-driven models that impact decision-making in real-time markets?

We invite applications for a Joint-PhD position at the University of Amsterdam, in collaboration with quantitative trading firm Deep Blue Capital. This PhD project will be carried out under joint supervision from academia and industry, with affiliations at both the Korteweg-de Vries Institute for Mathematics (KdVI) and the Informatics Institute (IvI), as well as Deep Blue Capital.

This unique setting gives you the opportunity to combine rigorous academic research with real-world applications in quantitative finance, particularly statistical arbitrage.

What are you going to do?

You will work 60% of the time on your PhD-project, and 40% of the time on projects at Deep Blue Capital. Those projects will be closely related to the subject of the PhD-project, but more practically oriented.

The PhD-project focuses on the development of advanced machine learning methods for statistical arbitrage trading. You will work on enhancing the predictive and decision-making components of trading systems by leveraging deep learning, time-series modelling, and high-dimensional feature extraction. The project consists of three interlinked sub-projects:

1. Time-Series Feature Extraction
2. Deep Learning for Price Forecasting
3. Execution Timing and Portfolio Optimization

You will:

- Conduct independent research under academic and industrial supervision, leading to a PhD thesis and publish your findings in top-tier journals and present at international conferences;
- Work with large, high-frequency financial datasets;
- Engage in the full ML lifecycle: from problem formulation and data processing to model deployment and backtesting;
- Assist in the teaching of an undergraduate course in financial mathematics at UvA.

Your profile

You are a proactive and analytically strong researcher with a passion for data science, mathematics, and financial markets. You thrive in multidisciplinary settings and enjoy balancing theoretical and applied research.

Your experience and qualifications:

- MSc (or equivalent) in mathematics, computer science, artificial intelligence, financial engineering, or a closely related field;
- Excellent academic record, with expertise in machine learning, statistical analysis, and numerical methods;
- Proficiency in Python (preferred) or related programming languages such as R, MATLAB, or C++;
- Experience with time-series modelling, especially deep learning architectures (e.g. RNNs, transformers) or signature methods;
- Familiarity with handling big datasets and computational tools;
- Experience working in Linux/Ubuntu environments is a plus;
- Knowledge of financial modelling or algorithmic trading is beneficial.

Bonus points if you have:

- Experience with backtesting frameworks or real-time model deployment;
- Exposure to statistical arbitrage, portfolio construction, or execution algorithms;
- Background in dimensionality reduction and data-driven forecasting techniques.

Our offer

We offer a temporary contract for 40 hours per week for a duration of 4 years (initial contract of 18 months with extension upon positive evaluation). The employment contract will be with Deep Blue Capital (the position is fully funded by Deep Blue Capital), there will be a separate agreement with the UvA regarding the PhD and intellectual property.

The gross monthly salary ranges from €2,770 to €3,539. Additional benefits include:

- 8% holiday allowance and a discretionary end-year bonus.
- Participation in UvA's doctoral training programme;
- 25 vacation days per year (full-time basis);
- Courses and training for personal and professional development;

About the University of Amsterdam

At the University of Amsterdam, over 30,000 students and 6,000 staff work together in an international and interdisciplinary academic environment. You will be embedded in both the Korteweg-de Vries Institute for Mathematics and the Informatics Institute, collaborating with the Stochastics and Computational Science Lab and benefiting from close ties with Deep Blue Capital.

About Deep Blue Capital

Deep Blue Capital is a highly automated proprietary trading firm specialized in algorithmic trading that trades with its own capital. DBC operates a variety of statistical arbitrage strategies that trade on over 30 equity and futures markets in thousands of securities worldwide. DBC is a small firm (around 15 employees) with an informal culture.

Any questions?

Dr. Sven Karbach

Assistant Professor of Data-Driven Mathematical Finance

Email: s.karbach@uva.nl

Dr. Mike Derksen

Senior Quantitative Trading Developer at Deep Blue Capital

Email: mike.derksen@deepbluecap.com

Job application Instructions

Applications should include the following, submitted as a single PDF file

- A detailed CV (include months/years);
- A motivation letter;
- A list of publications or academic work (master's thesis)
- Names and contact details of two academic references.

Email the PDF to **both** of the following recipients in one email:

mike.derksen@deepbluecap.com and s.karbach@uva.nl

Applications close on 30.06.2025 . Interviews will be held during July, 2025.