Research Office
1 University Drive
Athabasca, AB T9S 3A3

Research Assistant Opportunity
Part Time Position – Faculty of Science and Technology

Fourier Transform-based Denoising and Dimension Reduction in
Deep Learning Stock Trend Prediction

Posting Start Date: November 12, 2026
Posting Closing Date: November 27, 2026
Position Start Date: As soon as possible

Overview:

This project is seeking a Research Assistant to support the development and analysis of a Fourier Transform denoising technique and multi-stage dimension reduction in Deep Learning stock market prediction. Given the variable and dynamic behavior of market trends, identifying a reliable and efficient method of reducing the complexity of stock data while maintaining its informational value is critical to improving the performance of predictive models. In this research, we strive to apply and test some mathematical and statistical approaches to reducing data complexity in the stock trend prediction task.

The position is based in Alberta, Canada, and will require approximately three hundred hours of work.

Key Responsibilities include, but are not limited to:
• Carry out the necessary literature review to tackle the scientific questions posed in the research study
• Data collection and processing, including descriptive and preliminary statistics of stock market data.
• Outline of the theoretical structure and development of the mathematical, statistical, and Machine Learning models used in this research.
• Use advanced programming tools in Python to design the requisite Deep Learning models, implement the data processing steps, and collect performance data across various methods and modelling techniques.
• Analyse model performance using appropriate statistical techniques and interpret the results.
• Present the results in LaTeX and initiate the writing of a manuscript of the research and results.

The successful candidate will work under the supervision of Dr. Gustavo Carrero, Associate Professor at the Faculty of Science and Technology, Athabasca University.

Qualifications:
• Strong background in Applied Mathematics, Data Analysis, Mathematical and Statistical Modelling, Machine Learning and Finance.
• Advanced data science skills, including extensive knowledge of Machine Learning and Deep Learning models and applications.
• Research experience in developing mathematical and Machine Learning models in finance, economics, and other real-world applications.
• Extensive experience in Python programming (including Machine Learning tools), data processing techniques, statistical analysis methods, modelling and numerical simulations.
• Preferably Master's Degree or PhD in Data Science, Machine Learning, Mathematical Modelling, and/or Computer Science.
• Experience in writing academic articles for peer-reviewed scholarly journals in the fields of Mathematics and Computer Science.

How to apply:
Qualified individuals are encouraged to submit their application by email to Dr. Gustavo Carrero at gustavoc@athabascau.ca with the subject line "Denoising and Dimension Reduction in Deep Learning Stock Trend Prediction", including the following as a single PDF file: (i) A brief cover letter that summarizes your skills, experience and interest in the project; (ii) a current resume or curriculum vitae; and (iii) the contact information of 1 or 2 references.

Evaluation of applications will begin immediately and will continue until November 25, 2026, or until a suitable candidate is found. All applicants are thanked for their interest in this position; however, only candidates selected for an interview will be contacted.

Athabasca University and the researchers are committed and seek to support equity in employment and research opportunities. We strongly encourage applications from Indigenous people, people of colour, people with disabilities, 2SLGBTQ+ people, women, and other historically marginalized groups. Applicants are welcome, but not required, to self-identify in their letter of application.

For more information on this Research Assistant Opportunity, please contact Dr. Gustavo Carrero at the coordinates below. Applications will be accepted until November 25, 2026, or until a suitable candidate is found.

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