

## Deep Learning in Financial and Actuarial Mathematics (TU Wien, Supervisor: T. Rheinländer)

### Predocctoral Assistant (FAM)

The **Financial and Actuarial Mathematics Group (FAM)**, (<https://fam.tuwien.ac.at/>) of the Institute of Statistics and Mathematical Methods in Economics, TU Wien, invites applications for a predoctoral position (PhD student) in the area of deep learning in financial and actuarial mathematics.

The contract is for 4 years. The position can be filled earliest on May 1, 2020.

**Responsibilities:** The successful candidate is expected to apply neural networks to various problems in finance and/or actuarial science. Possible topics include, but are not limited to, volatility estimation, the limit order book, mortality projections and solvency capital requirements. The algorithms should be implemented via backpropagation, hence via a gradient descent method including curvature considerations. Particular emphasis is on the design of an optimal network topology regarding the number of hidden layers and nodes per layer, as well as the choice of the activation function. A theoretical analysis should follow which describes how the concrete problem specifications lead to this optimal network topology. The position carries a teaching load of about 1.5 weighted hours per semester (this corresponds to 3 hours of exercise classes per week) in the Bachelor and Master's program of Financial and Actuarial Mathematics.

**Qualifications:** The successful candidate will hold (or will obtain before the beginning of the contract) a Master's degree or equivalent in mathematics, or a related field (e.g., computer science or theoretical physics with a strong background in relevant mathematical topics).

**Other skills:** Knowledge in mathematical stochastics, stochastic analysis and optimization, as well as programming skills (Python) are desirable.

An active participation within the Vienna School of Mathematics (<https://vsmath.at/>) is expected.

Knowledge of German is desirable but not necessary. In case there is no adequate knowledge of German, willingness to quickly learn German is required for teaching.

**Salary Range:** The monthly minimum salary is currently (in the collective agreement §49 (3), pay grade B1, level 1) EUR 2.196,80 gross (14x per year). Prior experience may result in higher salary. The contract is for 30 hrs/week.

Application Information: The application should include the following documents:

- Statement of interest (Motivationsschreiben),
- Curriculum vitae,
- A copy of education degrees: e.g. Bachelor degree, Master degree, etc. and course transcripts, GPA (grade point average), with translation if not in English or German,
- Reference letter(s) or contact information for references

Application Deadline: **February 20, 2020.**

For further information about the position, please contact Prof. Dr. Thorsten Rheinländer, <[thorsten.rheinlander@fam.tuwien.ac.at](mailto:thorsten.rheinlander@fam.tuwien.ac.at)>.

Please send your application via e-mail to Ms. Triebel-Kraus <[barbara.triebl-kraus@tuwien.ac.at](mailto:barbara.triebl-kraus@tuwien.ac.at)> with copy to <[fam@fam.tuwien.ac.at](mailto:fam@fam.tuwien.ac.at)> including a brief cover letter in the main body of the email and subject: "Application for FAM predoc".

TU Wien is an equal opportunity employer and places particular emphasis on fostering career opportunities for women. Qualified women are strongly encouraged to apply. Preference will be given to female candidates when equally qualified. Persons with disabilities are equally encouraged to apply. For further information please contact Gerhard Neustätter, <[gerhard.neustaetter@tuwien.ac.at](mailto:gerhard.neustaetter@tuwien.ac.at)>.