

Workshop

Applied AI in Risk and Finance

Organizational details

Instructor:	Dr Julian Oliver Dörr
Dates:	Lab: January 29, 2026, 2.00 pm to ~5.00 pm Lab: January 30, 2026, 2.00 pm – ~5.00 pm Lab: February 5, 2026, 2.00 pm – ~5.00 pm Lab: February 6, 2026, 2.00 pm – ~5.00 pm Lab: February 12, 2026, 2.00 pm – ~5.00 pm Lab: February 13, 2026, 2.00 pm – ~5.00 pm Presentations: March 6, 2026, 2.00 pm - ~5.00 pm <i>After the lab sessions, the instructor will be available for questions and discussions until ~6.00 pm.</i>
Location:	Online via Big Blue Button
ECTS:	4
Max. number of participants:	15

Objectives

This seminar is aimed at doctoral candidates eager to explore how various subfields of Artificial Intelligence are applied in practice. Unlike typical PhD courses, this seminar emphasizes how advanced methods that originated from research can be leveraged to solve practical problems in finance and risk management. The goal is to bring you up to speed with practical tools, techniques, and frameworks that will benefit your present and future professional endeavors — whether in academia or industry. While traditional graduate courses focus heavily on theory, this course prioritizes bridging the gap between theory and practice. We will cover essential topics such as version control (Git), data cleaning and visualization, Python programming, and, most importantly, the application of AI techniques from Machine Learning (ML), Natural Language Processing (NLP), and Generative Artificial Intelligence (GenAI).

Content & Methods

Machine Learning – Developing a Risk Model (Lab 1 & 2, January 29 – 30)

The focus will be on a step-by-step process of modeling risks and predicting future uncertain outcomes using popular Python libraries such as **scikit-learn** and **pandas**. The concrete use case looks into the uncertainty of what a leased out car can be resold at the end of the lease term, a typical risk faced by

car leasing entities. The goal is to understand how machine learning can add value in assessing risks that organizations operating under uncertainty are facing.

Key methods:

- **ML pipelines**
- **Tree-based ML algorithms** (e.g., Regression Tree, Random Forest, Gradient Boosting)
- **Model training and model inference**

Natural Language Processing – Automating Insurance Claims Processing (Lab 3 & 4, February 5 – 6)

Participants will explore how NLP techniques can enhance the processing of insurance claims. While the use case is specific to insurers, the techniques can be easily adapted to other use cases, such as your own research, where practitioners are facing unstructured text data.

Key methods:

- **Text Vectorization** (e.g., tf-idf, word embeddings)
- **Text Clustering** via topic modeling

Generative AI – Building an Annual Reports Agent (Lab 5 & 6, February 12 – 13)

The focus will be on building a Multi-Document Risk Agent, a conversational AI system that allows users to chat over the contents from annual reports of publicly listed companies.

Key methods:

- Introduction to **Generative AI** and **Large Language Models** (LLMs)
- **Retrieval-Augmented Generation** (RAG)
- The concept of **agents**

Discussion forum: Throughout the course, you might encounter questions or technical issues that aren't easily resolved by yourself. For these moments, the course offers a [discussion forum](#) where you can post questions related to the material or setup. This forum serves as place to connect with peers, share solutions, and collaborate. Often, others have faced similar challenges and can offer helpful advice.

Target group & Course Language

Target group: Doctoral candidates and postdoctoral researchers

Participation requirements: All course code is written in **Python**. While coding is not the primary focus and much complexity is abstracted through functions and classes, having some prior experience with Python or any other object-oriented programming language is recommended. This will allow you to focus on the AI concepts and applications without getting bogged down by programming basics.

To help you gauge your Python skills, I have prepared a short [self-assessment quiz](#) featuring simple Python programming tasks. There is no grading—just a way for you to check your readiness. If you find

the tasks challenging, consider brushing up on Python basics before starting. A great resource is this engaging, free 2-hour crash [course](#) for complete beginners.

Course language: English

Requirements for ECTS credits

To gain the ECTS, participants have to:

- Download suitable software for the course work.
- Create a Github account.
- Actively participate in the lab sessions.
- Work independently on a take home assignment and present it at the end of the workshop.

Technical setup:

General information: All required software is **open-source and free**. Please aim to complete installation before the first lab session. I will be available to assist with setup issues in the week prior to the start of the course via the [discussion forum](#). In the discussion forum you can also find a walkthrough [video](#) that guides you through the setup.

Python: We will use **Python 3.12** throughout the course (download [here](#)). Our primary development environment will be JupyterLab, which you will install as part of the virtual environment setup. If you prefer, you can also use other IDEs like PyCharm or Visual Studio Code.

Git and Github: We will use **Git** for version control (install instructions [here](#)) and **GitHub** for hosting and collaboration (create an account [here](#)). While this course is not focused on Git, basic Git operations like cloning repositories will be part of this course.

About the instructor

Your instructor for this course will be Dr. Julian Dörr, who earned his doctorate from the University of Giessen. His dissertation focused on the innovative application of statistical learning techniques within applied economic research, demonstrating a strong foundation in both quantitative analysis and real-world economic challenges. He brings practical experience to the classroom, having worked as a Data Scientist across multiple industries. His professional background includes developing data-driven solutions and leveraging advanced analytics to solve complex business problems. Currently, he works in AI Software Development at Atruvia AG developing AI agents for the banking sector.

Registration

By *****January 19, 2026***** via e-mail at info@ggs.uni-giessen.de.