



The EUROPEAN SUPERVISOR EDUCATION INITIATIVE (ESE)

presents the web-based workshop on

“MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE FOR FINANCIAL SUPERVISORS”

via WebEx from 01 – 03 December 2021

OBJECTIVES

In supervision, the analysis of large amounts of data and the development of sophisticated models that detect anomalies in the market are of crucial importance. The workshop “Machine Learning and Artificial Intelligence for Financial Supervisors” is designed to acquaint supervisors with the implications and limitations of the technology based on a hands-on learning experience. Participants experience a (virtual) multiple-day bootcamp with the aim to gain insights into the main building blocks underlying artificial intelligence (AI) applications. The programme includes introductory e-learnings on AI, neural networks and provides ample opportunity to interact with the trainer/s as well as participants from other European central banks and authorities.

TARGET GROUP

The course is intended for experts from central banks and supervisory authorities. In order to succeed in this workshop, it is strongly recommend to have a basic to intermediate level in programming, specifically:

> Participants should have first experiences working with Python and/or R.

FORMAT

Presentations, Q&A, assignments, group work, e-learnings / educational videos (accessible prior and after the workshop)

TRAINERS

Experts from academia and the Fintech field.

REGISTRATION

Please register via the ESE website: <https://www.ese-initiative.org/ease-en/trainings/online-registration>

Participation Fee: 500 – 625 EUR (depending on final number of participants)

Registration Deadline: Thursday, 16 September 2021.

Confirmations and the link for participation will be sent after the registration. Invoices will be issued by the ESE Secretariat after the training.

The web seminar will be delivered via WebEx.

WEB SEMINAR ORGANISATION AND HOSTING

ESE Secretariat at Deutsche Bundesbank, Central Office Frankfurt

Email: ese-initiative@bundesbank.de

Phone: 069/9566-7809 or -5107



EUROPEAN SUPERVISOR EDUCATION INITIATIVE

ESE Web Training

“MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE FOR FINANCIAL SUPERVISORS”

PROGRAMME

Wednesday, 01 December 2021

09.00 – 09.15 **Welcome**

*ESE Representative and
Lucas Schmitt, Head of Innovation Products at
TechQuartier*

09.15 – 10.45 **Session I:**

“Intro: Machine Learning vs. Econometrics”

- Intuition to use ML applications Predictions vs. mechanisms
- Problems, Biases, and Implications

*Dr. Kevin Bauer,
AI specialist - external consultant at TechQuartier,
Researcher at the SAFE Leibniz Institute – Research
Group: ‘Digitization of the Financial Industry’*

10.45 – 11.00 **Break**

11.00 – 13.00 **Session II:**

“Data Preparation for Machine Learning” (incl. tasks for participants)

- Workshop Setup: Pandas and Matplotlib
- Machine Learning – Data Preparation (incl. Assignment #1)

Dr. Kevin Bauer

13.00 – 13.15 **Q&A**



Thursday, 02 December 2021

09.00 – 11.00 **Session III:**
“Technology Deep Dive (Part I) – Algorithms and their application

- KNN Algorithm’s Tuning + Application
- KNN - Implications for Supervision

11.00 – 11.15 **Break**

- Ensemble Method Tuning + Application
- Ensemble Methods – Implications for Supervision

Dr. Kevin Bauer

11.15 – 12.45 **Session IV:**
“Technology Deep Dive (Part 2) – Neural Networks”

- The application of neural networks
- Neural networks in supervision
- Assignment / Group Work #2

Dr. Kevin Bauer

12.45 – 13.00 **Q&A**



Friday, 03 December 2021

09.00 – 11.00 **Deep Neural Nets & Convolutional Nets**

- Convolutional Networks
- Backpropagation and Overfitting
- Danger and Limits

Dr. Kevin Bauer

11.00 – 11.15 Break

11.15 – 12.00 **Startup Insight Session and Q&A:
“Real-Life example on the application of Artificial
Intelligence in the context of supervision and banking”**

*TBD, Startup C-Suite representative - startup with
proven record on applying AI in the market and context
to supervision*

12.00 – 12.05 Break

12.05 – 12.45 **Open Discussion on the Implications of Artificial
Intelligence in the context of Supervision**

*Dr Kevin Bauer and Bundesbank Supervision Expert
and/or Start-up Representative*

12.45 – 13.00 **Q&A and Closing remarks**

13.00 End of Web Seminar



Preparatory E-Learnings / Online Courses (2 weeks prior and 1 month after the workshop)

Course 1 **Introduction Course – Artificial Intelligence**

- AI – A general purpose technology
- What is AI – From the origins until today
- AI – Problems, Biases and Implications

Course 2 **Prediction Machines**

- Perceptron's and Neural Networks
- Backpropagation and Overfitting
- Convolutional Networks
- Danger and Limits