

FIN525 Machine Learning, Deep Learning and Applications in Finance

Level: 5

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JAN

Synopsis:

FIN525 Machine Learning, Deep Learning and Applications in Finance aims to equip the students with model constructing and programming skills so that they can have a good understanding of the trending machine learning (ML) and deep learning (DL) techniques used in the financial industries. It introduces the concepts as well as fundamentals of classic algorithms and models in machine learning and deep learning. During the course, various financial data types and applications will be covered. It will help the students learn different machine learning and deep learning approaches in the financial context and gain experience applying the models to different financial data types and applications through multiple hands-on demonstrations and exercises using Python.

Topics:

- Understanding ML & DL
- Fundamentals of classic ML models such as k-means, logistic regression, support vector machine (SVM)
- Fundamentals of classic DL models such as Artificial Neural Network (ANN) and Convolutional Neural Network (CNN)
- Introduction to different finance data types (e.g. time series data, cross-sectional data, and texts)
- Framework of ML & DL Application in Finance
- Risk analysis and forecasts using predictive modelling
- Stock market prediction using multilayer neural network architecture
- Textual analysis adopted in annual reports, media news and white papers
- Sentiment analysis and topic modelling in Python
- Portfolio analysis by machine learning
- Python programming for machine learning
- Python programming for deep learning

Textbooks:

: Artificial Intelligence, Data and Blockchain in a Digital Economy
ISBN-13: 9789811218972

: AI & Quantum Computing for Finance & Insurance World Scientific Publishing
ISBN-13: 9789811203916

Learning Outcome:

- Assess various ML & DL models
- Appraise the importance and application scenarios of ML and DL frameworks
- Design ML and DL models to tackle financial issues and analyse model performance
- Construct and implement deep learning and machine learning models in different financial practices
- Compose sentiment analysis on textual data
- Develop the programming skills used to model ML and DL applications in finance

Assessment Strategies - Regular Semester (Evening Class):

Components	Description	Weightage Allocation (%)
Overall Continuous Assessment	PARTICIPATION 1	10
	GROUP BASED ASSIGNMENT 1	40
Overall Examinable Components	ECA	50
Total		100

*The information listed is subject to review and change.