COURSE SYLLABUS

Python Machine Learning Advanced

Take your machine learning expertise to the next level in this comprehensive, hands-on course designed to transform foundational ML knowledge into practical, real-world applications. Move beyond standard Jupyter notebooks and explore how professional ML engineers build and deploy machine learning systems across diverse domains.

Group classes (Live Online) and onsite training are available for this course. For more information, email onsite@graduateschool.edu or visit: https://sdfm.graduateschool.edu/courses/advanced-machine-learning



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Course Outline

1. NLP & Sentiment Analysis

Environment Setup & NLP Fundamentals

- VS Code environment configuration, NLP libraries installation
- Tokenization, stopword removal, stemming, lemmatization
- Text representation with Bag of Words and TF-IDF

Sentiment Analysis Project

- Logistic Regression for sentiment classification
- Data splitting, model evaluation metrics (accuracy, precision, recall, confusion matrix)

2. Recommendation Systems

Collaborative Filtering

- User-based and item-based filtering
- Cosine similarity for personalized recommendations

Content-Based Movie Recommender

- Vectorizing text using TF-IDF
- Implementing content similarity algorithms

3. Flask App for Recommendations

Building an ML-Powered Web App

- Flask basics and web serving
- Developing a recommendation system Flask app

4. Forecasting & Deep Learning

Time Series with Facebook Prophet

Trend forecasting and visualization (e.g., market prices)

Deep Learning with PyTorch

- CNN basics, image classification using the CIFAR-10 dataset
- Model training, accuracy assessment, and confusion matrix interpretation

5. Object Detection

Real-Time Object Detection with YOLO

- Image detection and labeling with pretrained models
- Adapting YOLO models to video streams and real-time webcam input