Course Curriculum Overview

Introduction

- Course Curriculum Overview
- Knowledge requirements
- How to approach this course

Machine Learning - Research Environment

- **Machine Learning pipeline overview**
  - Data Gathering
  - Feature engineering
  - Feature selection
  - Machine learning model building
  - Model assessment

- **Both introduction and practical examples**
- **Starting point for deploying your machine learning models**

Machine Learning - System Architecture

- **Machine Learning System Architecture**
  - What is is and why it is important
  - Challenges of creating a suitable system architecture
  - Different architecture approaches
  - Architecture components

- **Building Reproducible Machine Learning Pipelines**

Building a reproducible ML pipeline

- **How to transform your jupyter notebooks into production ready code**
    - Different ways utilised in the industry
    - Procedural programming
    - OOP with a custom pipeline
    - OOP with third party pipeline
    - Pros and cons of each method
    - Our recommendation
    - BONUS: should we integrate feature selection into the production pipeline?

Course Setup and Key Tools

- Git refresher
- System path and pythonpath refresher
- Virtual environments
- How to use the course resources

Machine Learning Pipeline Application

- Train the model and make predictions
- Ensuring data format - data validation
- Versioning and Logging
- Building a python package with the model

Serving the Model via REST API

- Introduction to Flask

- Creating the API skeleton

- Versioning and Logging

- Schema validation

Continuous Integration and Deployment Pipelines

- Introduction to CI/CD

- CircleCI

- Publishing the model to Gemfury

- Testing the CI pipeline

Differential Testing

- Setting up differential tests
- Differential testing in CI

Deploying to a PaaS (Heroku)

- What is a PaaS?
- Utilising Heroku
- Testing the deployment manually
- Deployment to Heroku using CI

Running Apps with Containers (Docker)

- Intro to containers and Docker

- Installing docker

- Creating an API App Dockerfile

- Building and Running a Docker container

- Releasing to Heroku utilising Docker

Deploying to an IaaS (AWS)

- Intro to AWS

- Creating an AWS account

- Installing and Configuring the AWS CLI

- Elastic Container Registry

- Elastic container Service

- Deploying to ECS using CI

Deploying with Big Data - Deep Learning

- Classify images with CNN

- Challenges of deploying models using big data

- Updating applications to big data

- AWS S3 for large datasets

Common Issues Found During Deployment

Summary of problems encountered during model deployment and how to resolve them

Final section with next steps and vouchers to other courses from the instructors

Help and support

- **Frequently asked questions**
- **Links with more information**
- **Dedicated help from your instructors**