Machine Learning for Professionals

Description:

This professional training course emphasizes on machine learning techniques and applications for finding interesting patterns / information from large amount of data. Participants will learn to design, implement, and evaluate intelligent systems incorporating models learned from large data.

Training Period: 24 hours (3 days)

Target Audience: business leaders, mid to senior managers, data specialists, consultants, and business professionals.

Required Skills: Python

Learning Outcomes:

On successful completion of the training course, the training professionals will be able to:

1. Formulate a practical data analysis and understand machine learning techniques.
2. Identify the characteristics of the data set required for a particular machine learning problem
3. Train and test supervised regression and classification models, unsupervised learning and density estimation models, and reinforcement learning models.
4. Integrate a trained machine learning model into an online software systems.

Learning Materials:

1. **Introduction to Machine Learning**
    - What is machine learning
    - Steps in typical machine learning projects
    - Fitting model to data
    - Optimising cost function
    - Handling, cleaning, and preparing data
    - Selecting and engineering features
    - Selecting model and tuning hyper-parameter
    - Challenges in Machine Learning: underfitting and overfitting problems

- Feature extraction

2. **Supervised Learning**
    - Training, validation, and testing datasets
    - Logistic Regression and softmax
    - K-Nearest Neighbors, SVM, Decision Tree
    - Dimensionality Reduction: Principal components analysis
3. **Unsupervised Learning**
    - K-Means and K-Medians
4. **Neural Networks**
    - Perceptrons and inspiration from neuroscience
    - Multilayer neural networks and backpropagation
    - Optimization techniques, best practices, loss curve analysis

Training Course Outline:

Day1:

- What is machine learning
- Python ML Libraries: Numpy, Pandas, Mapplotlib, Scikitlearn
- Steps in typical machine learning projects
- Fitting model to data
- Optimising cost function
- Handling, cleaning, and preparing data
- Selecting and engineering features
- Selecting model and tuning hyper-parameter
- Challenges in Machine Learning: underfitting and overfitting problems
- Feature extraction

Day2:

- Training, validation, and testing datasets
- Logistic Regression and softmax
- K-Nearest Neighbors, SVM, Decision Tree
- Dimensionality Reduction: Principal components analysis

Day3:

- K-Means and K-Medians
- Perceptrons and inspiration from neuroscience
- Multilayer neural networks and backpropagation
- Optimization techniques, best practices, loss curve analysis

Session(s): This professional course will fully provide the hands-on.

Learning Resources:

Textbooks:

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Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow:
Concepts, Tools, and Techniques to build intelligent system. O'Reilly, 2019