# Practical Machine Learning & Deep Learning Course


*Who can learn the course?* The course is designed for everyone who interests in Machine Learning and Deep Learning (ML & DL) technologies as well as AI based applications *(Teaching in Vietnamese language).*

*What is the necessary background?* The necessary background is at least to finish the first year in a university with a basic Algebra Mathematics.

*What does the course provide?* The course aims to provide very basic concept of ML & DL technologies (e.g. Deep Neural Network, Transfer Learning, Inception, Model Decompression, Model Deployment, etc.) and how to apply these techniques into real-life applications (e.g. image classification, image captioning, audio detection, audio segmentation, text prediction, etc.).

*What will a learner gain from the course (Scope of the Course)?* Learners can obtain a big picture of applying ML & DL in AI domain. By doing practice from experiments provided by the course, Learners can adapt and work well on a wide range of AI based companies.

*How to register the course and check the fee?* Please kindly request the access to the Facebook group: https://www.facebook.com/groups/1854594508269628

*What is the course content?* Please kindly check the schedule below (2 hours per day, maximum 20 persons)

## Day 1: Introduction

1. Tutor & Assistant Profiles
2. Introduction
   + Group of skills for ML/DL technology
   + Scope of the course
3. The Role of Research Papers in ML/DL
4. ML/DL jobs & LinkedIn

## Day 2: Working Environment

1. Linux OS (Installation & Using)
2. Bash Shell & Vim
3. Anaconda
4. Jupiter Notebook
5. Google Colab
6. Working with remote servers

## Day 3: Python Langue for ML/DL

1. Python basic
2. Function & Loop
3. OOP
4. Algebra
5. Data type
6. Search/Sort Algorithm
7. Numpy and Matrix
8. Plotting
9. Read input data (csv/image/audio/video, etc.)
10. Others

## Day 4: Linear & Gaussian Models

1. Linear Regression
2. Logistic Regression
3. Gaussian Model & Hypothesis Test

## Day 5: K-mean & Decision Tree

1. K-mean
   + K-mean explanation
   + K-mean for Iris classification
2. Decision Tree (DT)
   + DT explanation
   + Apply DT for Iris classification

## Day 6: Stroke Detection Using ML models

Stroke detection Kaggle Competition

## Day 7: Multilayer Perceptron (MLP)

1. Forward & Backward in MLP
2. Apply MLP for Iris classification

## Day 8+9: Convolutional Neural Network (CNN)

1. CNN explanation
2. Apply CNN for Iris Classification
3. Apply CNN for RS Image Classification (Transfer Learning, Attention)
4. Apply CNN for sound scene classification (Inception)
5. Apply CNN for Video Classification
6. Encoder-decoder (EC-DC) explanation
7. Apply EC-DC for image denoise

## Day 10+11: Recurrent Neural Network (RNN)

1. LSTM & GRU explanation
2. Apply RNN for Iris classification
3. Apply RNN for predicting text
4. Apply CNN-RNN for audio detection
5. Transformer explanation
6. Apply transformer for Image Captioning

## Day 12+13: Deploy ML & DL models

1. Deploy ML & DL technology
   + Frontend develop (Streamlit, HTML)
   + Backend develop (flash)
   + API
   + Docker
   + Python library
2. Low complexity DL model
   + Deconvolution
   + Teacher -Student Scheme
   + Pruning technique
   + Quantization technique

## Day 14: Summary

# TUTOR: DR. LAM PHAM

GitHub (*link*); Linkedin (*link*); Google Scholar (*link*)
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## MOTIVATION FOR THE PRACTICAL ML & DL COURSE

**Nearly 15-year experience working on wide range of domains and different technologies (VLSI Design, DSP, Embedded System, Machine Learning, Deep Learning, etc.) motivates to share my knowledge. Hope that my course can be beneficial and help to build up your career path, especially in AI domain.**

## EDUCATION

**University of Kent, UK** *July 2020*
**PhD Fellow in Computer Science**

**Ho Chi Minh University of Technology, Vietnam** *September 2012*
**MSc in Electrical & Electronic Engineering**

**Ho Chi Minh University of Technology, Vietnam** *March 2009*
**Bachelor in Electronics & Telecommunication Engineering**

## KAGGLE COMPETITIONS

- **Top-one team of IEEE BioCAS 2023 on Respiratory Sound Classification (*link*)**
- **Top-eight accuracy of DCASE-2023 Task 1 Challenge (*link*)**
- **Top-four accuracy of DCASE-2022 Task 1 Challenge (*link*)**
- **Top-seven accuracy ranking of DCASE-2021 Task 1A Challenge (*link*)**
- **Top-five accuracy of DCASE-2021 Task 1B Challenge (*link*)**
- **Top-six team ranking of DCASE-2020 Task 3 Challenge (*link*)**
- **Top-five team ranking of DCASE-2019 Task 1B Challenge (*link*)**

## EXPERIENCE

**Data Scientist** *February 2021 - Present*
***DSAI, Austrian Institute of Technology (AIT)*** *Austria*

**Postdoctoral researcher** *August 2020 - January 2021*
***CVSSP, University of Surrey*** *UK*

**PhD Fellow** *November 2017 - July 2020*
***School of Computing, University of Kent*** *UK*

**Lecturer** *March 2013 - October 2017*
***Ho Chi Minh University of Technology*** *Vietnam*

**Software Engineer** *March 2010 - February 2013*
***Renesas Electronics Corp.*** *Vietnam*

**Software Engineer** *June 2009 - February 2010*
***Synopsys Corp.*** *Vietnam*

**Software Engineer Intern** *January 2009 - May 2010*
***Intel - Altera Corp.*** *Vietnam*