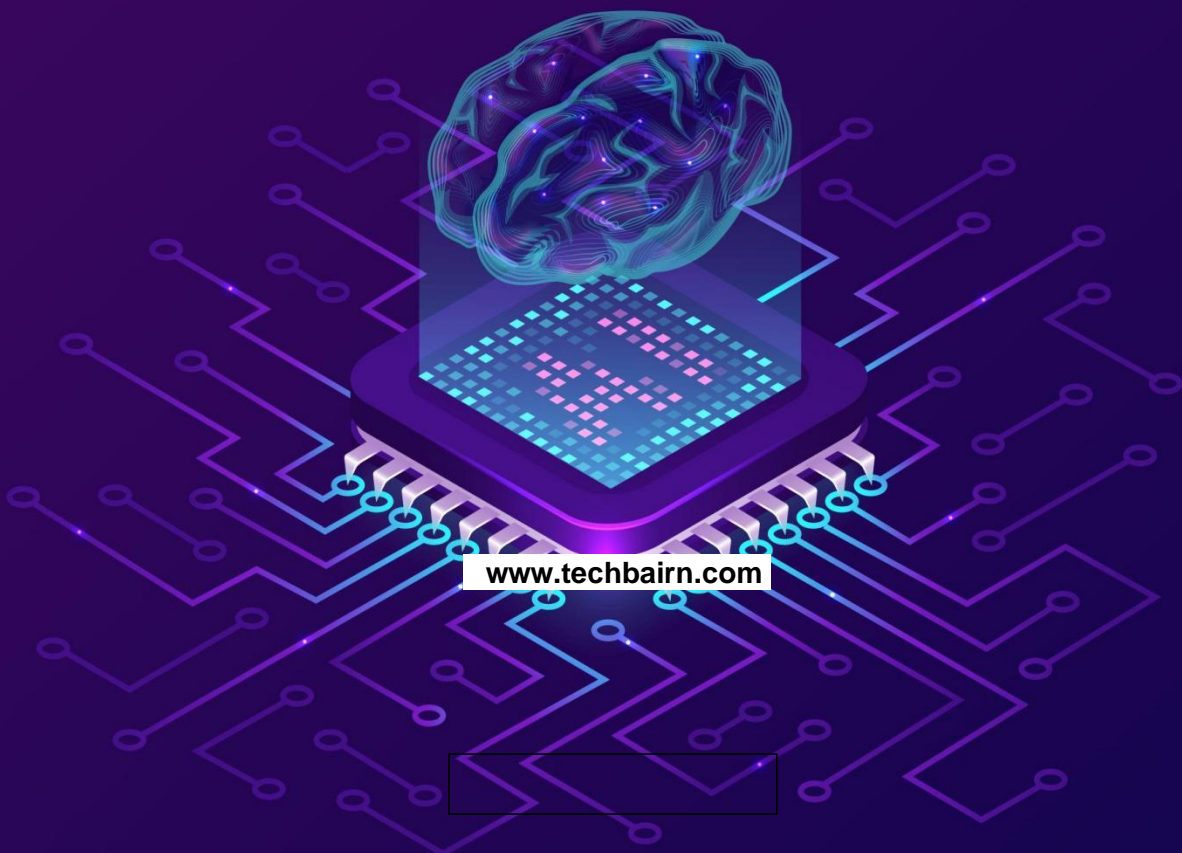


MACHINESTER

A complete Machine Learning course

COURSE HANDOUT



www.techbairn.com

Machinester - A course on Machine Learning

Details of the course:

What is Machine Learning:

Machine learning is the study of computer algorithms which improves automatically through experience. It is seen as a subset of artificial intelligence.

A Machine Learning Engineer has an in-depth knowledge of several ML algorithms. The Engineer's job is to analyse different kinds of tasks given to them and decide which algorithm will be best for the specific task. They also have the responsibility of making APIs and making the algorithms ready for production.

TechBairn presents you a Machine Learning course which will teach you the fundamentals of ML from very basics to a level where you can easily get a full-time job as a Machine Learning Engineer.

Pre-requisites:-

1. Decent knowledge of a Programming Language
2. High School Mathematics

Syllabus:

1. Who are we, What is Machine Learning - Introduction

- Who are we?
- Course objective
- Course outline
- Machine Learning, it's applications, scope
- Artificial Intelligence, Machine Learning & Deep Learning
- Current Landscape of the field --- what has happened, what's happening, where are we heading

2. Python - Basic Language Features

- Installation
- Basic objects - Strings, Integers & Floats, Booleans
- Complex Objects - Lists, Tuples and Sets
- Dictionary
- Conditionals - if/else/elif
- Iterations - For/While
- Functions

- List Comprehension
- Importing library
- Anaconda
- Jupyter Notebook
- Conda - Package Manager

3. Python Libraries - NumPy, Pandas, Matplotlib

- Numpy Arrays
- Subsetting Numpy Arrays
- 2-D Numpy Arrays
- Subsetting 2-D Numpy Arrays
- 2-D Arithmetic
- Basic Statistics
- Pandas Series
- Pandas DataFrame
- Pandas - Reading from flat files
- Matplotlib - Basic Plotting

4. Math Refresher

- Matrices and Vectors
- Matrix Multiplication
- Calculus - Differentiation, Integration
- Statistics
- Probability

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5. Supervised Learning - Regression

- What is Supervised Learning?
- What is Unsupervised Learning?
- Linear Regression
- Linear Regression - Model Representation
- Linear Regression - Cost Function
- Gradient Descent

Project 1: Temperature Prediction Model

6. Neural Network

- Quick intro without brain analogies
- Feed-Forward Neural Network
- Back Propagation
- Activation Function

7. PyTorch - Basics

- What is PyTorch?
- Torch Tensor
- Autograd - Automatic Differentiation
- Neural Network in PyTorch
- Training Neural Network in PyTorch

8. PyTorch - Image Classification

- Convolution Neural Network
- Image Classifier
- Transfer Learning
- Loading and Saving Models

Project 2: Training an Image Classifier - on your own data

9. Git & GitHub

- Git
- Add, Commit, Push, Pull
- GitHub
- Clone, Remote, Repo

10. Deployment

- API
- Flask
- Flask Application, Routes
- GET, POST Methods
- Web App
- Hosting a local Application to Web
- Creating an API for Image Classifier
- Deploying it on Azure App Service/Heroku

Final Project: Building a full-fledged Machine Learning WebApp

Project Description

Project 1: Build a Linear Regression Algorithm from scratch, and use this algorithm to train a Regression Model which will predict the temperature.

Project 2: Training an Image classification model to solve an Image Classification task of your own Interest. You will have to prepare your own Data. The aim is to learn about Dataset Preparation and Data Gathering along with Model Training in this Project.

Project 3. You have already learnt to Train a Machine Learning Model, Save the weights. Now it's time to make your Idea/Project accessible to other people around the web so that they can use your project. You need to build an API and then Deploy it to the Web for that. All these steps will be done in this Project.

Certification Criteria:

- Peer to peer interaction.
- Discipline & behaviour.
- Weekly assignments- submission of the repositories of the above projects (result evaluated in 4 days)
- Complete and submit a final project in team of 2 for a discussed project idea from a list of ideas.
- Top 3 teams will be declared based on Code Quality

Marking scheme:

Activity	Marks
Peer to Peer interaction	10
Discipline & Behaviour	10
Weekly assignments	30
Final Project	50

Internship After Course Completion:

Top performers after successful completion of the programme will get a chance of working with us as an intern.

Eligibility:

Anyone with a laptop (Minimum- i3, 4gb RAM) & an eagerness to learn.

Course Outcome:

Industry ready Machine Learning Developer with a good number of projects to showcase.

Contact Details:

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