ML

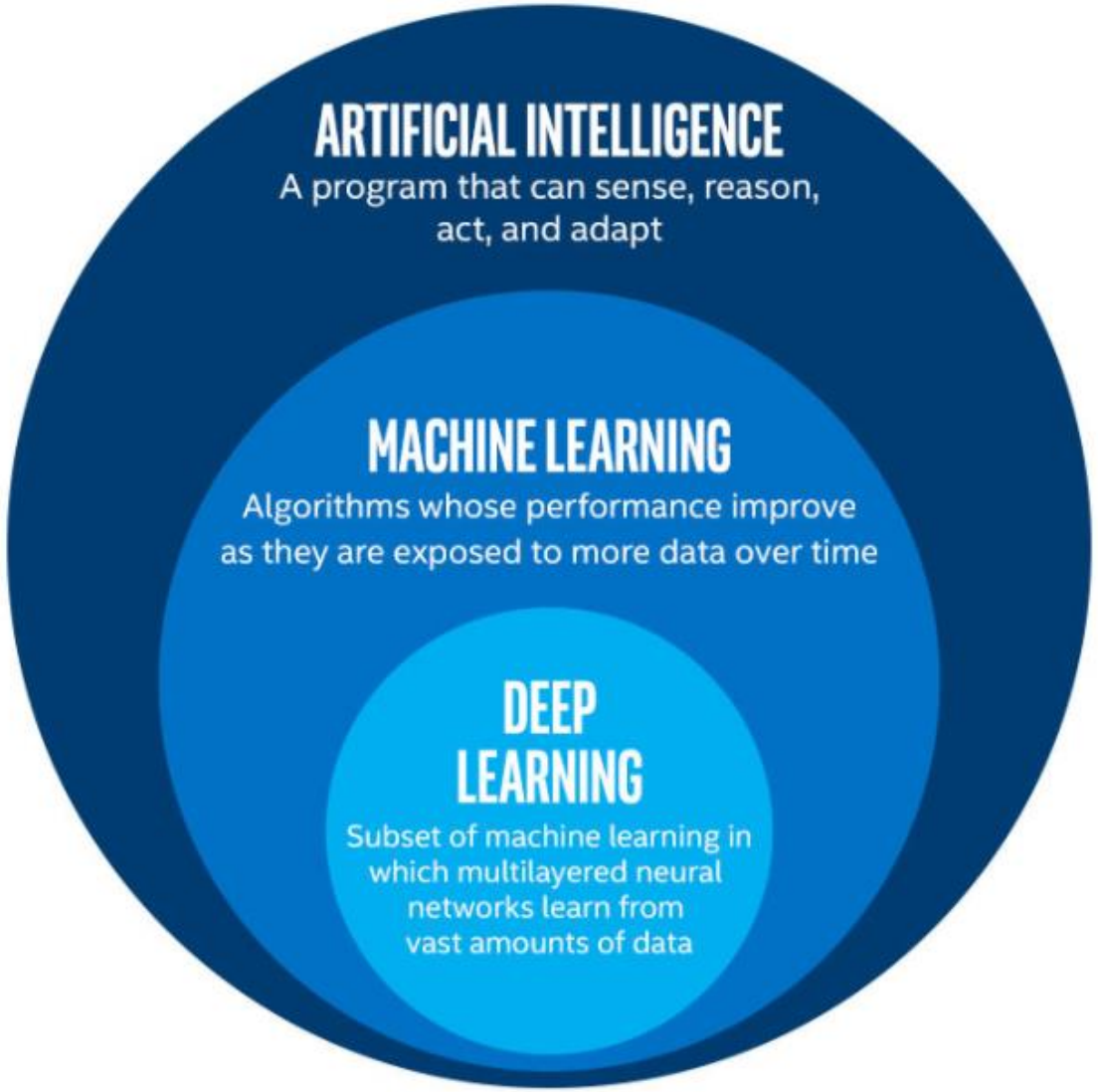
NIRMA
UNIVERSITY

Machine Learning

Orientation

What?

- Machine learning is the science of getting computers to act without being explicitly programmed.
- In layman's terms it's a science which gets better at performing tasks with experience.



Why?

- Firstly, Artificial intelligence will shape our future more powerfully than any other innovation this century.
- Data science, the most sought after job in this century relies heavily on statistics and machine learning.
- Machine learning provides for solutions that amount to sustainable growth and development of nations.
- One of the few concentration-independent and inter-disciplinary fields of science that is shaping the world we live in.

Types

- Supervised
  - Here we provide both data and correct labels to our algorithm to learn from it.
  - For example, labels for images, price for a house of specific area, loan availability based on salary, etc.
- Unsupervised
  - No label is provided, that is for an ‘x’ there is no ‘y’ and usually goal is find patterns in ‘x’.
- Semi-Supervised
  - Makes use of unlabeled data for training – typically a small amount of labeled data with a large amount of unlabeled data. Usage – Speech Analysis, Web content classification, etc.

Scope

- Finance
  - Banks, Stock markets, risk management, etc.
- Computer Vision
  - Self Driving Car
  - Healthcare
  - Object detection
- Marketing and sales
  - ML directed insights helps save tons of money in marketing.
- IoT and Edge devices
  - Insights from sensor data, traffic management, etc.
- NLP

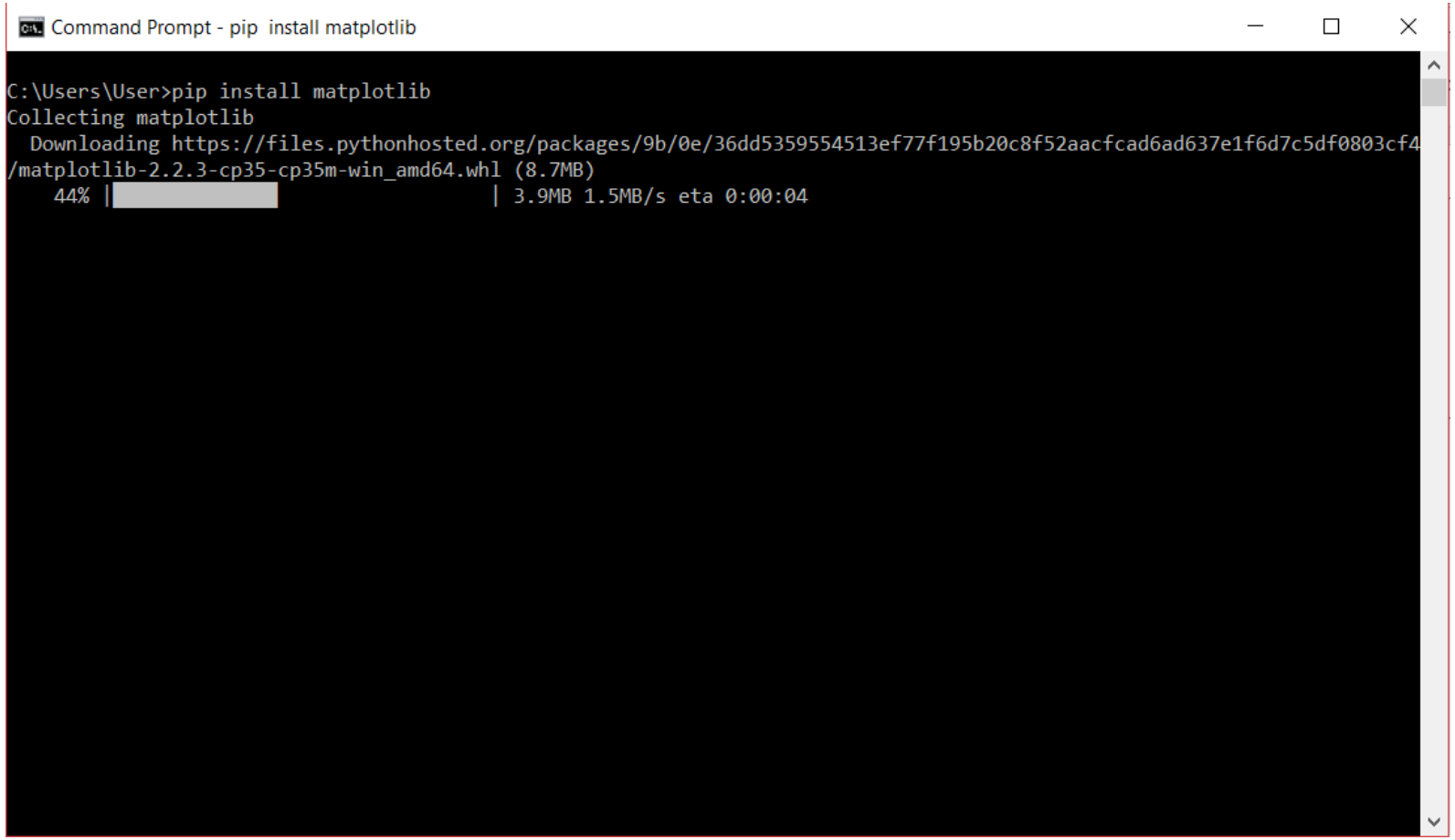
Lecture Series

- Basic Machine Learning algorithms
- Vanilla Neural Networks and Deep Neural Networks
- Convolutional Neural Networks
- Recurrent Neural Networks
- Generative Adversarial Networks
- AutoEncoders*, Restricted Boltzmann Machines*
- How to go about research in Machine Learning, and AI.

Python[Set it up before next lecture]

- Please tick on the option that says “Add to PATH” while installing python.[10]
- Install these libraries: Run in command prompt
  - Numpy [pip install numpy]
  - Pandas [pip install pandas]
  - Scikit learn[pip install sklearn scikit-learn]
  - Jupyter [pip install jupyter]
  - Matplotlib [pip install matplotlib]
  - Tensorflow [goto https://www.tensorflow.org/install]
  - Keras [pip install keras] (you’ll need to install tensorflow before doing this)
- https://www.udemy.com/python-for-data-science-and-machine-learning-bootcamp/

Sample Installation



High-End Computer

- It’s a myth. No, you don’t need to spend hefty on purchasing a new laptop with powerful GPU and big RAM.
- There are tons of resources available online on which you can run you machine learning algorithms.
  - Google Colab: https://colab.research.google.com
  - Kaggle Kernels: http://kaggle.com
  - Intel DevCloud: https://software.intel.com/en-us/ai-academy/devcloud
  - DeepCognition: http://deepcognition.ai/
  - Nvidia NGC: https://ngc.nvidia.com/

Week 1 Self-Task

- Watch Python videos and explore python.
- Explore various fields of machine learning(you can just google machine learning) and find what interests you the most.
- Make your GitHub account and create a repository for your ML journey.
- Set up git in you computer
  - https://git-scm.com/downloads
- Explore Medium

Further Reading

- https://machinelearningmastery.com/supervised-and-unsupervised-machine-learning-algorithms/
- https://towardsdatascience.com/machine-learning/home
- https://medium.com/@ageitgey/machine-learning-is-fun-80ea3ec3c471
- http://news.mit.edu/topic/artificial-intelligence2
- https://arxiv.org/list/stat.ML/recent

Resources

- https://www.python.org/downloads/release/python-352/
- Anaconda: https://www.anaconda.com/download/
- IDE: https://www.jetbrains.com/pycharm/
- Video Tutorials: https://drive.google.com/open?id=1pFJEbEHyqlobcTjaIXVCC8hBF5aeJU5f
- Git Repo: https://github.com/parampopat/machinelearning_lecture

Contact

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