GenAI for Coders

The Data Institute, USF

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Course Material

Each lecture the students will be provided at three files :

- **Lecture slides** that explains the theoritical content of the lecture.
- **Jupyter notebook Essentials** : that is attached to the lecture and explains the practical aspect of the content.
- **Jupyter notebook Homework** : a set of excersies that the students are expected to do in order to master the concepts explained the
- **Website** : USFCA-MSDS/GenAI4Coders (github.com) (To be populated as the course is given)

Course Content

Lecture 1 : Essentials of Deep Learning with Pytorch

In this lecture we will learn essentials of deep learning :

Optimization for deep learning, (stochastic) gradient decent algorithm, computational graphs, backprop, linear layers, convolutional layers, basic loss functions, creating basic models in pytorch and training them.

Course Content

Lecture 2 : Introduction to Generative Models

- Unets.
- Introduction to generative models: GANS, AE, VAE, Diffusion models.

Course Content

Lecture 3 : Image Generative Models

- Diffusion models, Stable Diffusion
- Diffusors in HuggingFace

Course Content

Lecture 4 : Text Generative Models

- Transformers For Text
- Large Language Models (1)

Course Content

Lecture 5 : Text Generative Models

- Large Language Models (2)

Course Content

Lecture 6 : Audio Generative Models

- Transformers For Audio
- Audio Generation in HuggingFace

Course Content

Lecture 7 : Multimodal Generative Models

- Introduction to CLIP models
- Imagen, DALLE2, Transfusion

Thank you