Advanced Data Science
NLP, Open CV, Gen AI
Duration –20 Days (7/8 hrs per day)

Modules

Natural Language Processing (NLP) – 8days

Introduction to NLP	NLP: Areas of Application	Understanding Text
Text Encoding	Word frequencies and stop words	Bag of words representation
Stemming and Lemmatization	TF- IDF representation	Canonicalisation
Phonetic Hashing	Spell Corrector	Point wise mutual Information
Gensim, Word2Vec	Word Embeddings	LSTM, GRU models
Bidirectional LSTM	Transformers	BERT

Open CV –6 Days

Introduction and revision on Open CV	Image Filtering	Implementing different filters (Gaussian, Median, Bilateral)
Edge detection algorithms	Sobel, Canny, Laplacian	Edge detection on real-world images and analyze the results.
Contour detection and its application	Extract features from contours	Contour manipulation and analysis
Histogram and equalization	Histogram equalization - enhancing image contrast	Feature detection algorithms
Object detection with Haar cascade	Template matching	Image stitching

Generative AI –6 Days

Introduction to Gen AI	Representing correlation of words in the numeric format	Topic modeling
Prompt Engineering	Application of Generative AI	Text Blob
Language Modeling	Hands on : Language Modeling	Working with LLM Models
Text generation and completion	Machine translation and summarization	Gen AI in computer vision
Image generation and transformation	Applications in art, design, and entertainment	

Modules	Days
Natural Language Processing (NLP)	**8**
Open CV	**6**
Generative AI	**6**
Total	**20 Days**