

Workshop

NLP using Generative Models:: Module 01

Speaker

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Building a startup (stealth mode)
Ex - Head of AI and R&D, funtoot



Agenda :: Module 01

- What is Generative AI?
- Key Domains
- The NLP Journey

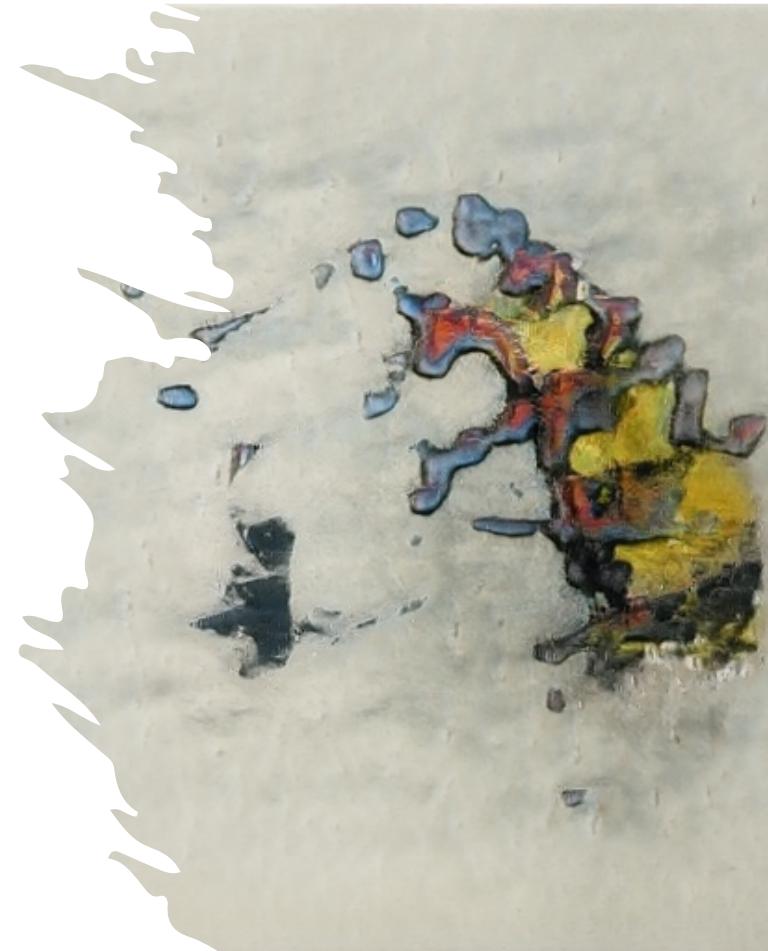
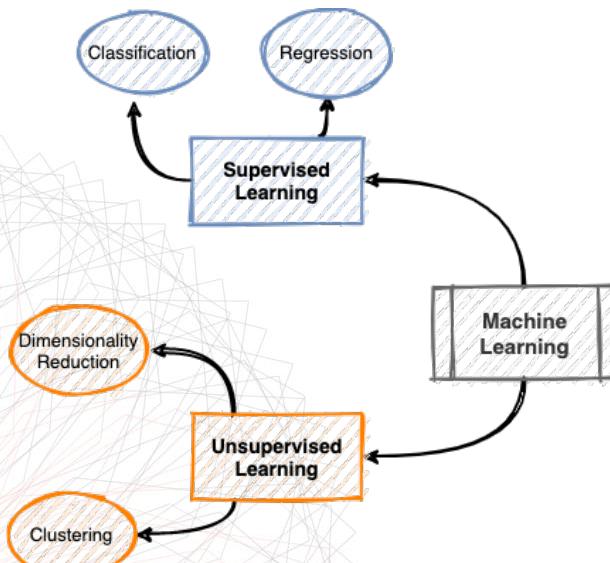


Image Sources:

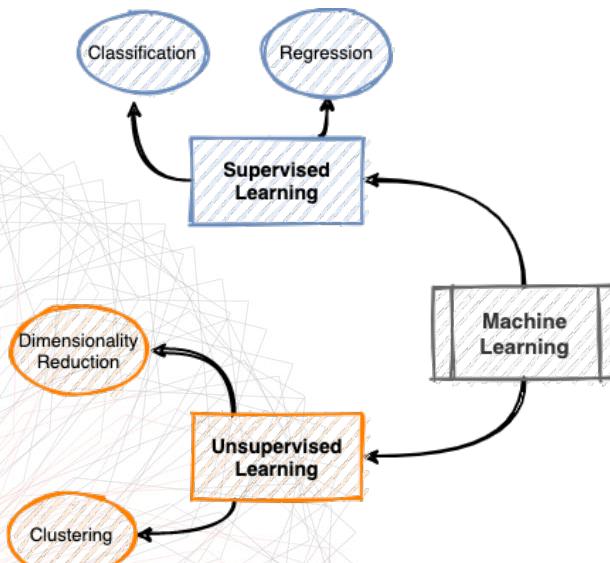
- [https://thisartworkdoesnotexist .com/](https://thisartworkdoesnotexist.com/)

Machine Learning Landscape



- **Supervised**
 - Regression
 - Classification
- **Unsupervised**
 - Clustering
 - Dimensionality Reduction

Machine Learning Landscape

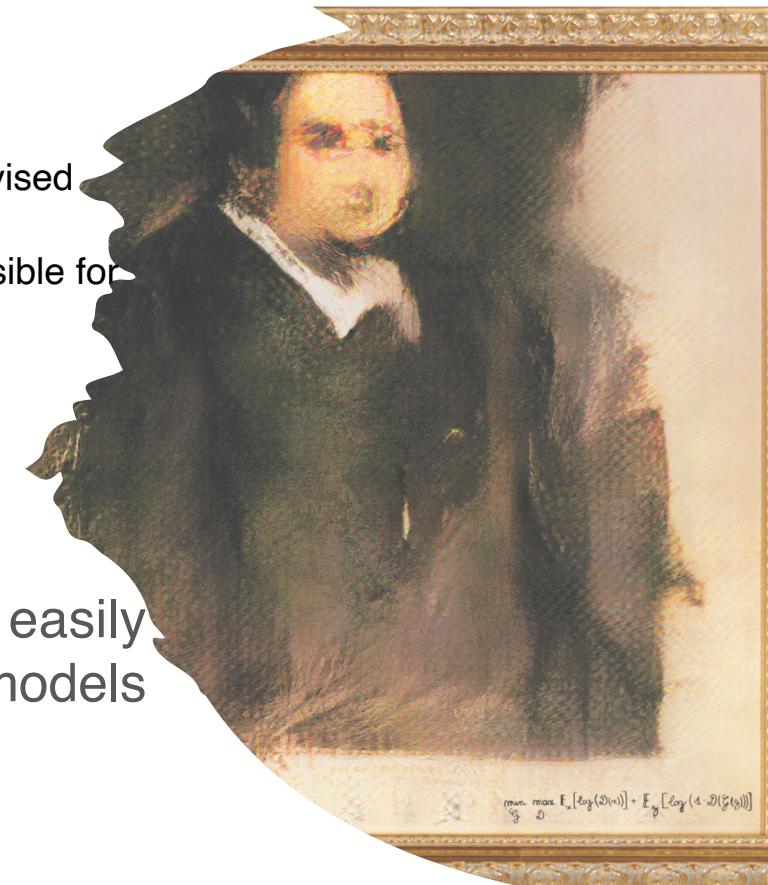


- **Supervised**
 - Regression
 - Classification
 - **Unsupervised**
 - Clustering
 - Dimensionality Reduction
- Discriminative Modeling

What is Generative AI?

- Generative models are a class of models in the unsupervised machine learning space
- These help us model the underlying distributions responsible for generating the dataset under consideration

“There is tremendous amount of data easily accessible in most cases. Generative models analyze and understand such datasets”



$$\max_{\mathcal{G}} \max_{\mathcal{D}} \mathbb{E}_{x \sim \mathcal{D}} [\log(\mathcal{D}(x))] + \mathbb{E}_{y \sim \mathcal{G}} [\log(1 - \mathcal{D}(\mathcal{G}(y)))]$$

Key Domains

- NLP
 - Text Completion
 - Code Generation
- Computer Vision
 - Image Generation (text to image, image to image)
 - Style Transfer
 - Super-Resolution
 - Image Out-Painting
- Audio
 - Audio Generation (text to audio, audio to audio)
 - Music Generation
- Video
- Multi-Modal



Image Sources:

- <https://stability.ai/stablediffusion> [prompt: Vintage hot rod with custom flame paint job]

The NLP Journey

- NLP
 - TF-IDF
 - RNNs
 - LSTMs
 - Word2Vec
 - Attention/Transformers
 - BERT / GPT
 - GPT2
 - InstructNet/InstructGPT
 - GPT3.5
 - GPT4



Image Sources:

- Neural.love [prompt: retro poster, programmer, laptop, music]