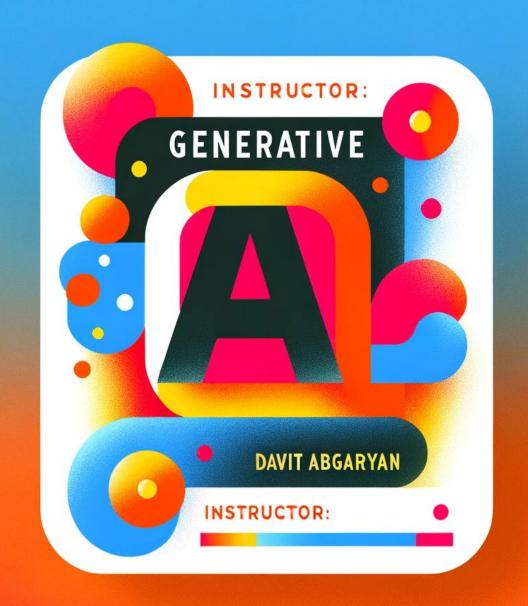
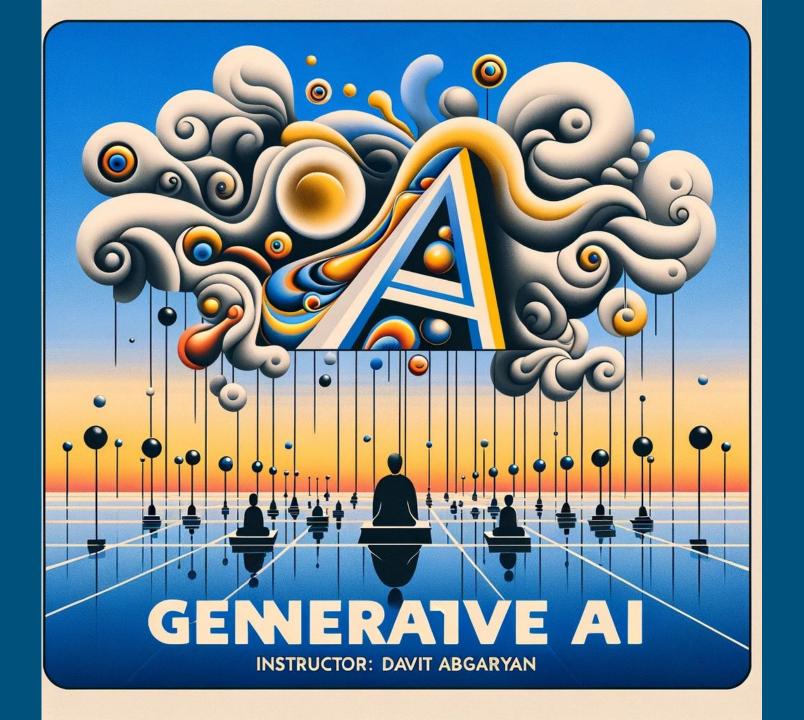
## Generative Al

Instructor: Davit Abgaryan, PhD









### About Me

Let's ask ChatGPT

### Let's dive into GenAl

#### **Generative Al**

**Definition:** An artificial intelligence capable of creating new content.

Types of content: Includes text, images, audio, video, music, etc.

**Learning process:** Models learn patterns and structures from input training data.

**Output:** Generate new data with characteristics similar to the training data

#### Generative Al VC Discriminative Al

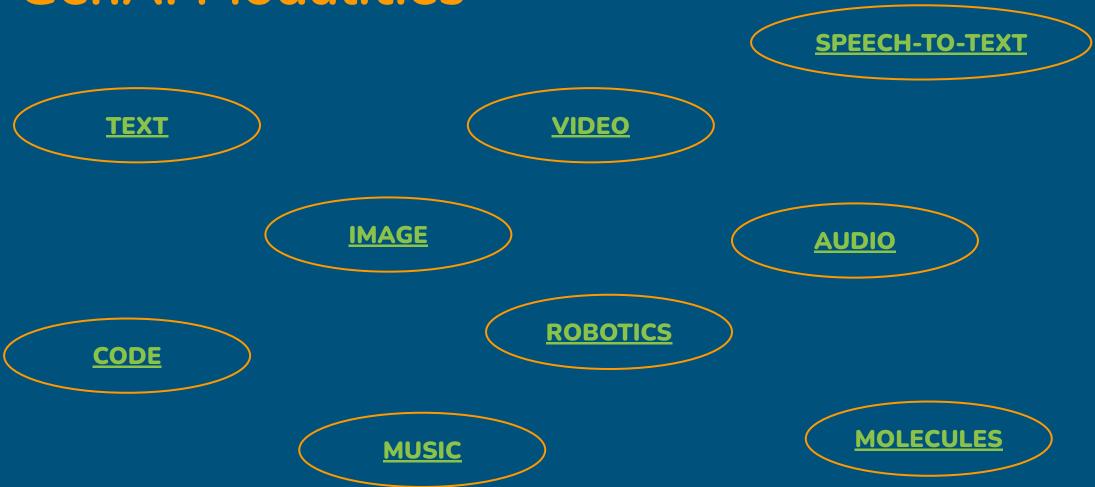
• Shift from cognitive to creative capabilities.

Moves beyond just recognizing, analyzing, or classifying existing content.

#### Artificial General Intelligence

- **Definition:** Autonomous system surpassing human capabilities in most economically valuable tasks.
- Primary goal for Al research and companies like OpenAl, DeepMind, and Anthropic.
- Varied predictions: From a few years to over a century.
- Controversy: AGI as a potential threat to humanity.

#### **GenAl Modalities\***



### History of GenAl

2018 — BERT

Bidirectional Encoder Representations from Transformers (BERT), an "encoder-only" transformer architecture, was introduced by Google. In a little over a year, BERT has become a ubiquitous baseline in Natural Language Processing (NLP).

2017 \_\_\_\_ Transformers

Transformer, a deep learning architecture that relies on the parallel multi-head attention mechanism, was introduced by Google. Later variation has been prevalently adopted for training large language models by virtue of the parallelized processing of input sequences.

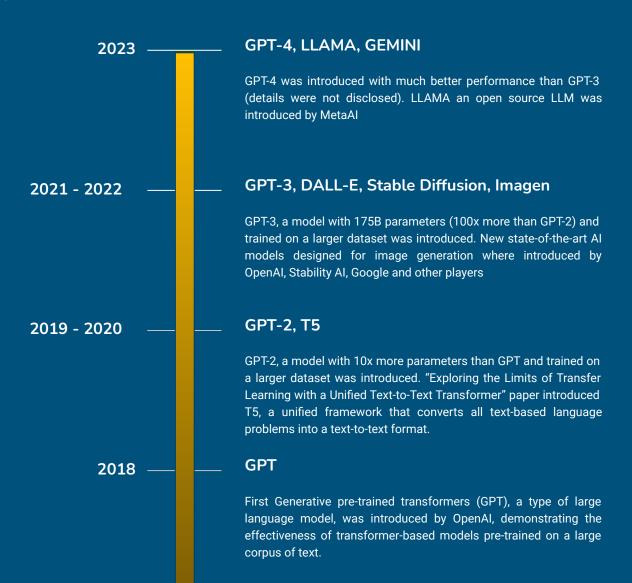
2014 \_\_\_\_ VAEs & GANs

The variational autoencoder and generative adversarial network produced the first practical deep neural networks capable of learning generative, rather than discriminative, models of complex data. These deep generative models were the first able to output not only class labels for images, but to output entire images.

2000s \_\_\_\_ Emergence of Deep Learning

Deep learning drove progress and research in image classification, speech recognition, natural language processing and other tasks. Neural networks in this era were typically trained as discriminative models

### History of GenAl



#### Ethical Considerations & Challenges

- Undistinguishable GenAI-generated text
- Realistic but fake content creation
- Non-consensual use of personal data in model training
- Bias and discrimination based on race, gender, or other factors
- Undefined originality when AI replicate styles or content
- Issues surrounding the ownership of Al-generated content
- Lack of clear legal frameworks, liability and accountability for content generated by AI

# Thank You