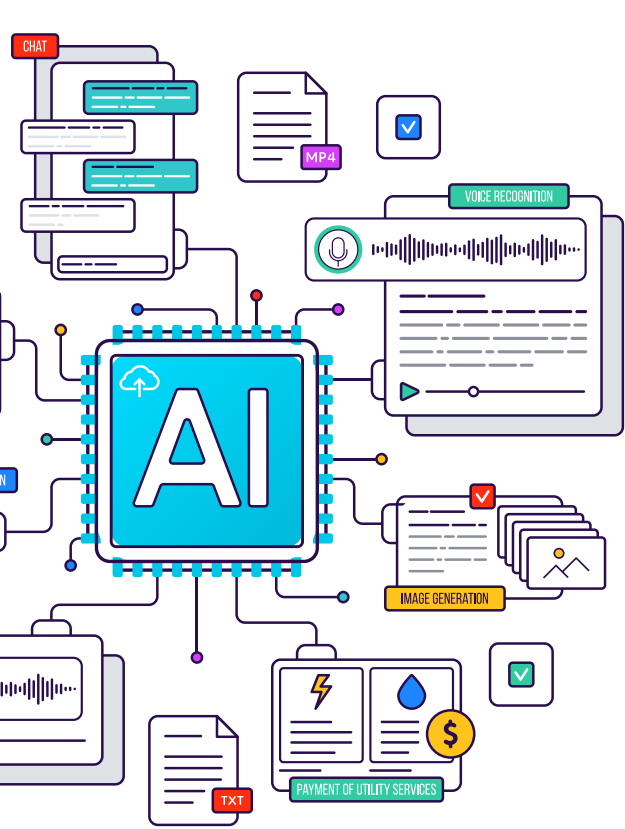


# Generative AI Models & Their Applications



## Generative AI Models DEFINED

**Generative AI models** are highly scalable artificial intelligence (AI) solutions that utilize complex algorithms, language modeling and neural networks to generate new, original material.

**Generative AI models** are able to supplement and transform various business operations by producing data, images, text and other forms of content autonomously.

## TYPES OF Generative AI Models

- **Variational autoencoders (VAEs)**  
Combines the power of autoencoders and probabilistic modeling for enhanced image, audio and video content creation
- **Generative adversarial networks (GANs)**  
Utilizes a generator network and a discriminator network to create highly realistic samples that resemble real data
- **Transformer-based models**  
Generates coherent and contextually appropriate language that expands AI capabilities in text generation
- **Neural radiance fields (NeRFs):**  
Produces novel views of complex 3D imagery based on 2D image inputs
- **Deep Reinforcement Learning (DRL) Models**  
Leverages the power of deep neural networks and reinforcement learning to enhance machine learning capabilities (decision-making and adaptive behaviors) in dynamic and complex environments



## APPLICATIONS OF Generative AI Models

<p><b>Image Generation</b> AI-generated images applied in art, design and entertainment industries</p>	<p><b>Text/content Creation</b> Human-like text used in natural language processing, chatbots and content creation</p>	<p><b>Code Documentation</b> Synthetic code applied with human and artificial programming languages</p>	<p><b>Video, Music &amp; Sound Generation</b> Generation and completion of video/sound synthesis for use across entertainment industries</p>
<p><b>Gaming Development</b> Creation of highly immersive storytelling and video game experiences</p>	<p><b>Medical Research &amp; Healthcare</b> Design of proteins and drugs; optimization of imagery in diagnostics</p>	<p><b>Cybersecurity &amp; Risk Management</b> Automation of digital security processes and improved visibility</p>	

## CHALLENGES & THE FUTURE OF Generative AI

- Organizations must implement generative AI and machine learning training procedures to keep pace with ongoing advancements.
- Care must be taken to prevent AI generation of illegal, inappropriate or harmful material.
- AI-generated content must be evaluated for bias as it may not have equal knowledge of all topics.
- AI does not currently cite or otherwise indicate sources, which opens up liability for copyright infringement, unreliable narrator, etc.
- Organizations must protect the privacy of personal data being accessed by AI.
- AI technologies consume significant amounts of energy and must be made more sustainable going forward.