Generative AI and Its Impacts

by Sadia Rahman and Nikaley Castillo

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RESEARCH HIGHLIGHTS

► **Since 2022, there has been mainstream adoption of generative AI models across major technological platforms that produce new content and respond to increasingly sophisticated prompts.**

► **These models are being further integrated into public and private sectors, including healthcare and education.**

► **Their integration, sometimes as a default without ways for users to opt out, raises policy challenges and questions given issues of bias, ownership, overreliance, misuse, and environmental health impacts.**

Generative AI refers to certain machine learning models that can create new content, such as text, images, audio, or code, in response to user prompts. Generative models aim to learn how data is produced by capturing underlying patterns from large datasets, allowing them to generate new examples that resemble the original data. This capability is driven by deep neural networks, which built upon artificial neural networks (ANNs) inspired by the human brain, that consist of interconnected units arranged in many layers to learn complex patterns. As ANNs evolved, they were increasingly used to implement two long-standing data modeling approaches: discriminative and generative models. Discriminative models focus primarily on prediction tasks, learning relationships between inputs and outputs to classify or separate outcomes. Generative models, by contrast, aim to learn how data itself is produced by capturing the underlying data distribution, making it possible to generate new examples that resemble the original data.

Foundation models have been central to recent advancements in generative AI applications. These models are deep neural networks trained on large amounts of data that learn patterns by solving "fill in the blank" tasks, such as predicting the next word in a sentence. Through this training, foundation models learn representations, meaningful summaries of concepts, patterns, and relationships in the data, which allow them to generate new content across a wide range of tasks.

In November 2022, the launch of ChatGPT catalyzed the mainstream adoption of generative AI across major technological platforms, including Microsoft, Meta, and Google, and in various sectors such as healthcare and education. This integration sometimes reflects a kind of default AI that is used even when users don't seek it out, and without offering them opportunities to opt out. As these systems become increasingly integrated into workplaces, public services, and everyday life, their expanding capabilities have raised several important policy challenges and questions related to their use and potential impacts.

- **Bias:** Bias can occur from the data used to train these systems or from design choices made by their creator, potentially reflecting and reinforcing existing societal biases.

- **Ownership**: Generative AI outputs often lack clear copyright protection and may be treated as ownership-free despite being derived from pre-existing work, raising concerns about consent, credit, and compensation.

- **Overreliance:** Overreliance on AI-generated content can impede creativity, critical thinking, and problem-solving while increasing automation bias. Among younger cohorts,

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REFERENCES

Full references are available on the web-based version of this note, which can be accessed using the QR code below or at rockinst.org/blog.

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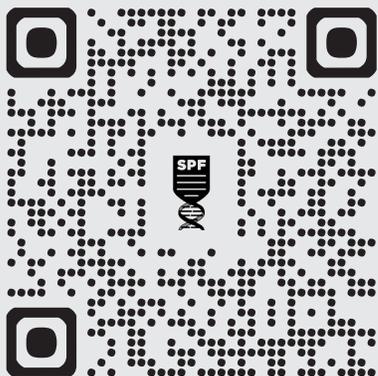
overreliance may have distinct long-term effects on cognitive development. They may also rely on AI for digital therapeutic support, potentially delaying engagement with qualified human professionals.

- **Misuse:** These systems can be misused to create deep fakes that generate false, scandalous, or defamatory content.

- **Environmental Health Impacts:** Training, deploying, and operating these systems require substantial computational resources, contributing to increased energy consumption, carbon emissions, and water use for data-center cooling.

Information Processing In Brains
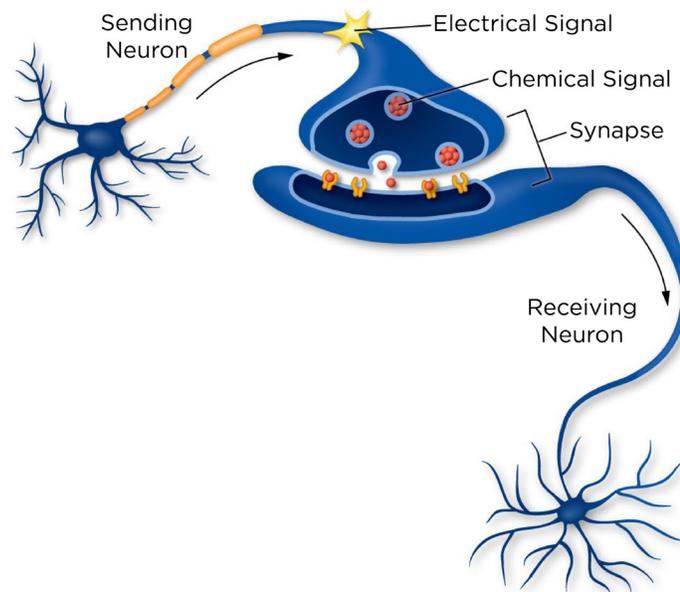
SOURCE: "Neurons Transmit Messages In the Brain," University of Utah, https://learn.genetics.utah.edu/content/neuroscience/neurons/.

Information Processing In Deep Neural Networks
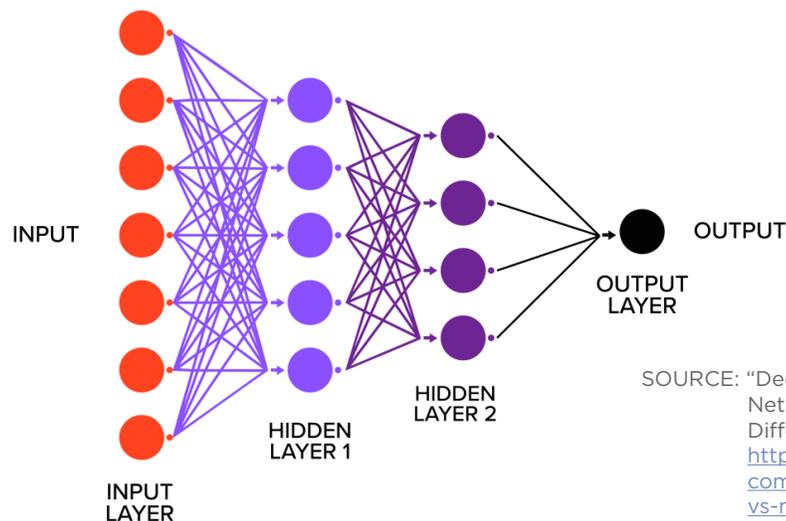
SOURCE: "Deep Learning vs. Neural Network: What's the Difference?," Smartboost, https://www.smartboost.com/blog/deep-learning-vs-neural-network-whats-the-difference/.