



Mahidol University
Faculty of Medicine
Siriraj Hospital



AMEE
BASEL
2024

Generative AI (GAI) in the Future of Medical Education: Insights from AMEE 2024

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WHAT'S NEW IN



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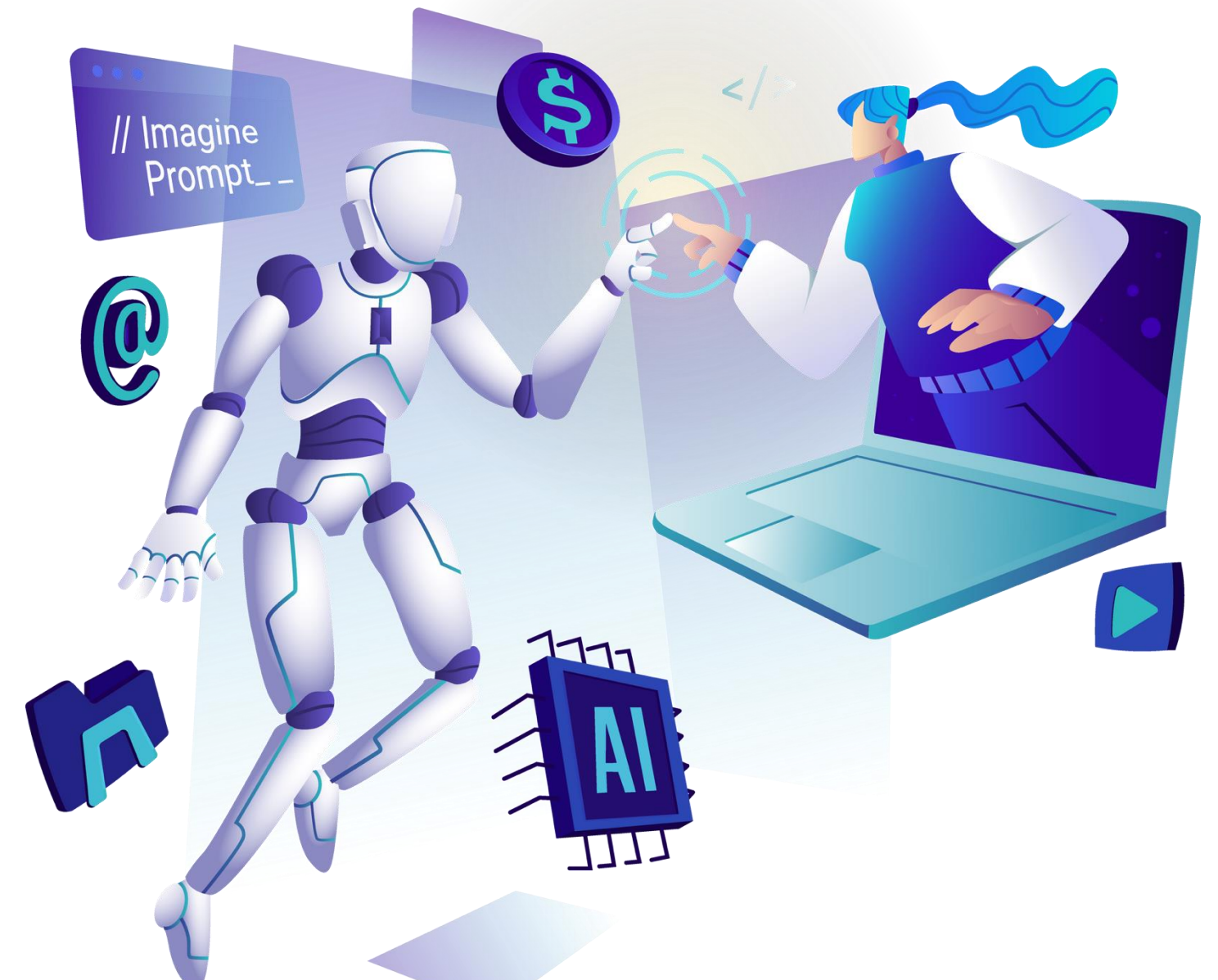
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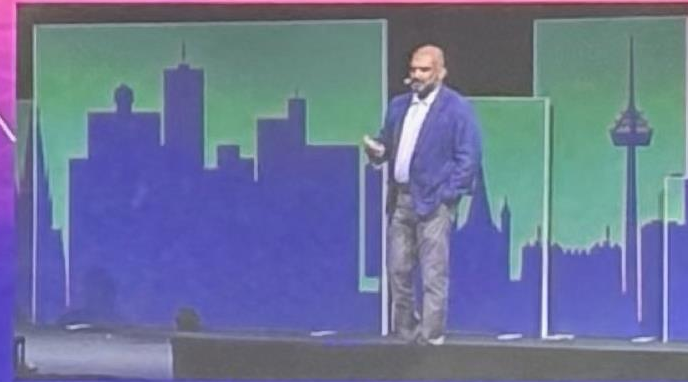
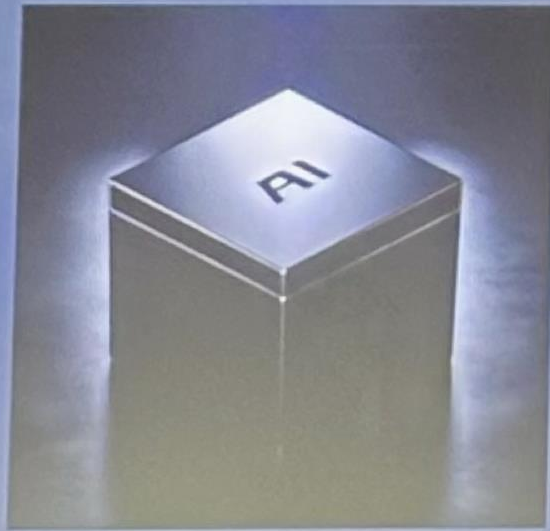
Preparing Students for a Future with Generative AI

- ● ●
- **Generative AI (GAI)** is rapidly becoming part of clinical and academic workflows.
- **AMEE2024** discussed the **role of GAI in health professions education**, focusing on preparing students to use these tools responsibly.
- The **GOAL** is to **integrate GAI while ensuring cognitive engagement and critical thinking**



Designing Health Education Curricula to Prepare Students for a Generative Artificial Intelligence Future

What is Artificial Intelligence?



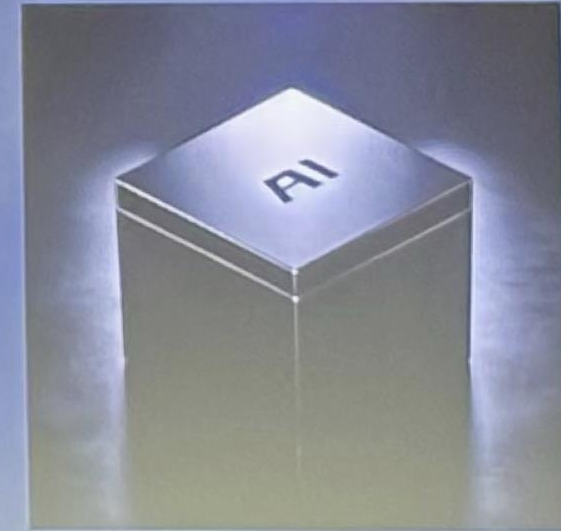
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Develop Your Educational Career
CONNECT, GROW AND INSPIRE



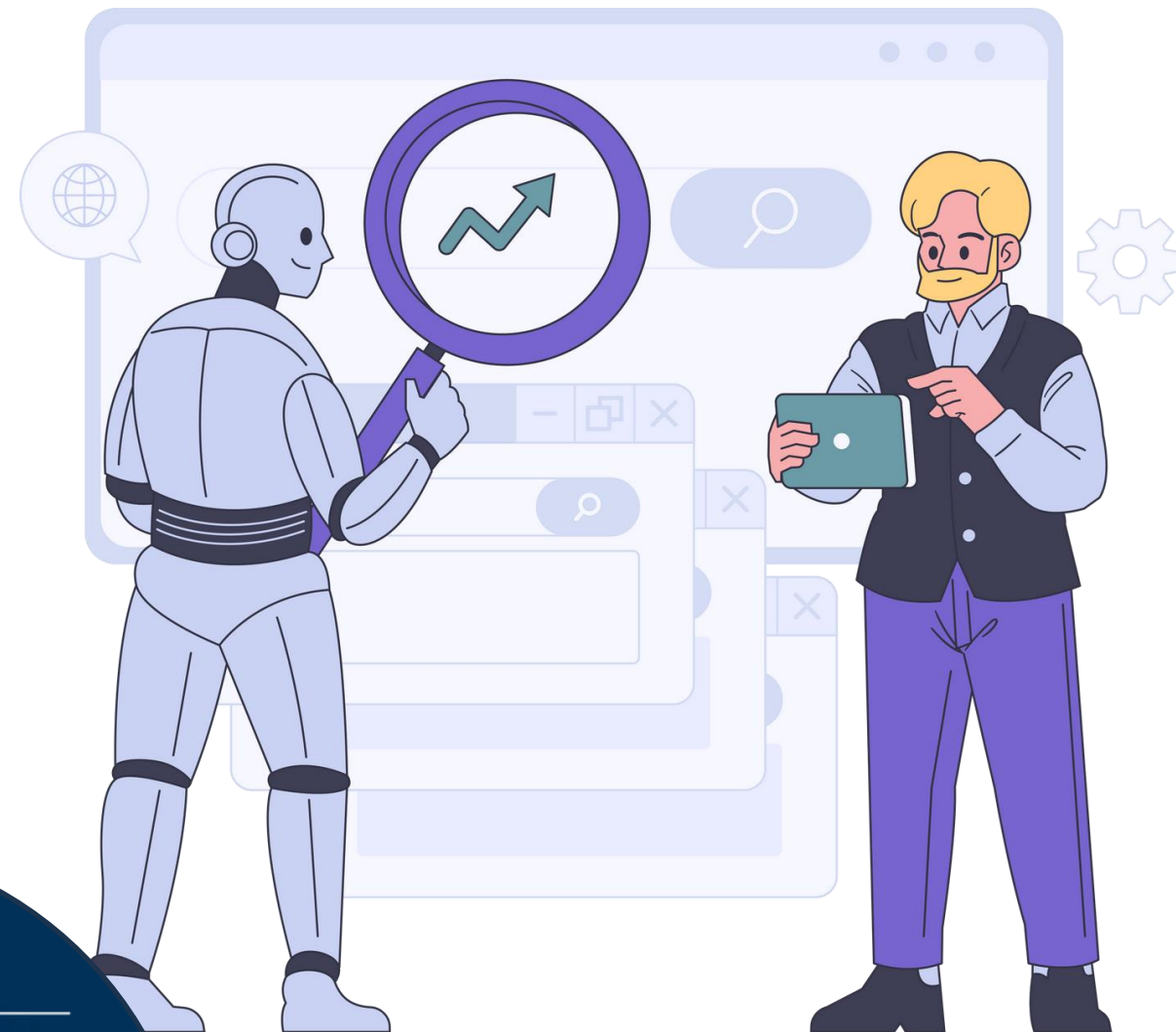
www.amee.org
24 - 28 August 2024

What is Artificial Intelligence?





Why Generative AI in Health Professions Education?



- **Opportunities:** GAI improves productivity, provides **personalized learning**, and enhances **clinical simulations**.
- **Challenges:** Risks include **bias, inaccuracies**, and **over-reliance on AI**, which can hinder learning.

AI must complement—not replace—human learning and problem-solving.



Integrating Generative AI into Health Professions Curricula



- **AI tools** automate routine tasks but **should encourage independent reasoning.**
- **Create learning activities** where students use AI for support but engage in deeper cognitive efforts.

**Personalized learning plans,
with real-time feedback.**





Designing Curricular Activities



Easy to Complex



Creating an interactive quiz



Assessing Essay-type questions



Developing a lesson plan



Custom GPT



Notebook LM



Neil Mehta



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Develop Your Educational Career



Virtual Patient GPT



Jennifer Benjamin



Develop Your Educational Career



GAI for USMLE Preparation

Table 1: Example of a student applying the IoED and iterative prompting framework for a curricular assignment (Copied from authors' interaction with ChatGPT 4omni)

Student Prompts	LLM Response	Hypothetical student thought process
<p>A hypothetical case:</p> <p>Elderly male with ASCVD risk factors presents with sudden onset of Left LE weakness.</p> <p>The left knee DTRs are increased.</p> <p>The UE and Face are normal.</p> <p>What would be possible causes of this presentation?</p>	<p>In an elderly male with atherosclerotic cardiovascular disease (ASCVD) risk factors, the sudden onset of left lower extremity (LE) weakness with increased knee deep tendon reflexes (DTRs) while the upper extremities (UE) and face remain normal is suggestive of a possible stroke, specifically an ischemic stroke affecting the right hemisphere of the brain.</p> <p><u>Possible Causes:</u> Ischemic Stroke: <i>Location:</i> This presentation could be due to an infarct in the right motor cortex or the corticospinal tract at a level above the lower extremities. The lack of involvement of the face and upper extremities suggests that the lesion is localized to the region controlling the left lower extremity. <i>Pathophysiology:</i> Atherosclerotic plaque rupture or thromboembolism leading to occlusion of a cerebral artery.</p> <p>Lacunar Infarct: <i>Location:</i> Small vessel disease in the deep brain structures (e.g., internal capsule or pons) that selectively affects motor pathways to the lower extremities. <i>Pathophysiology:</i> Microatheroma and lipohyalinosis in penetrating arteries, often associated with hypertension and diabetes.</p> <p>Spinal Cord Lesion: <i>Location:</i> A lesion in the spinal cord (e.g., at the thoracic or lumbar level) can cause weakness and increased reflexes in the lower extremity while sparing the upper extremities and face. <i>Pathophysiology:</i> Compression or infarction of the spinal cord due to an atherosclerotic process, spinal stenosis, or embolic event.</p>	<p>The LLM identifies that the increased DTRs would mean an upper motor neuron (UMN) lesion and correctly suggests a hemispheric stroke on the opposite side.</p> <p>The LLM then adds the possibility of a corticospinal tract lesion and correctly states that it has to be above a certain spinal cord level to cause UMN weakness.</p> <p>"I should probe this a little further. I can ask about the location of the hemispheric stroke and blood vessel territory or about the location of the lesion in the corticospinal tract... I will go with the latter."</p>



Develop Your Educational Career

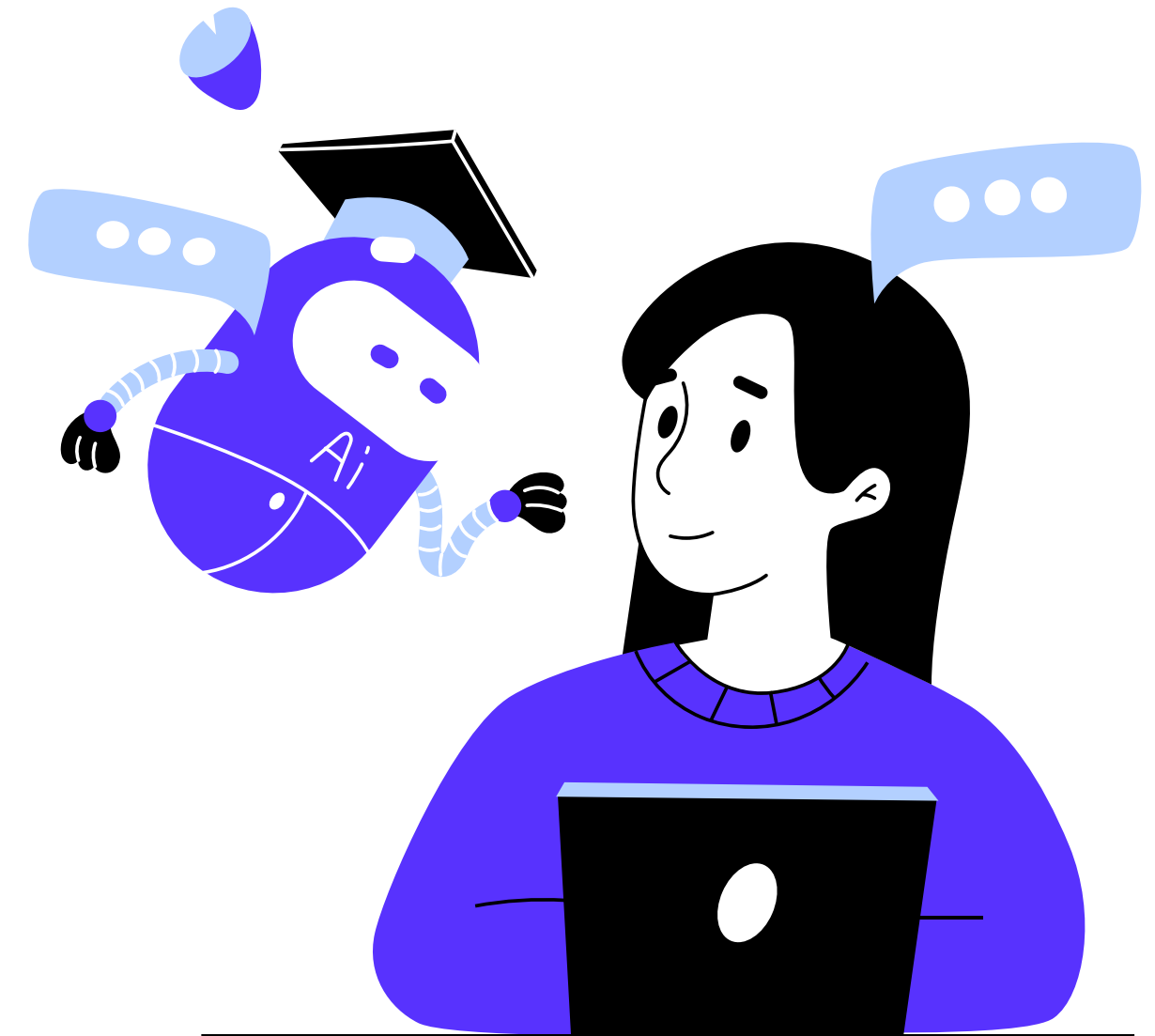


Benefits of Generative AI & Custom GPTs



- GAI & Custom GPTs **automate repetitive tasks** and **provide real-time feedback**.
- GPTs support **self-directed learning**, allowing students to engage at their own pace.

A **virtual patient GPT** interacts with students, helping them **practice case management and clinical reasoning**.





Challenges of Implementing GAI



Data Accuracy

Hallucination

**Over-reliance on AI
AI Dependency**



Automation Bias



**Educators must guide students
in balancing AI assistance with independent thought.**



Training Educators and Students for Generative AI



- **Educator Training:** Educators need to learn how to design and manage custom GPTs.
- **Student Training:** Teach students best practices in using AI for learning and clinical decision-making.

**AI is a tool to enhance learning,
not a substitute for reasoning.**



Ethical Considerations in Generative AI



- **Privacy & Data Security:** Protect student and patient information.
- **AI Hallucinations & Misleading Data:** Ensure students can identify and correct **AI-generated errors**.



Educators must reinforce the importance of critical evaluation of AI outputs.



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Take-Home Message:

1. **AI as a Tool:** Generative AI (GAI) can enhance health professions education by improving efficiency and offering personalized learning experiences, but it should support, not replace, human reasoning.
2. **Balance is Key:** GAI tools must be integrated thoughtfully to automate routine tasks while ensuring that students continue engaging in critical thinking and problem-solving.
3. **Challenges and Ethics:** Educators must address AI's limitations, including bias and inaccuracies, and ensure ethical use, particularly around privacy and data security.
4. **Training Essential:** Both educators and students need training to use AI effectively, focusing on critical evaluation and recognizing AI's role as a supplement to deeper learning.

Bottom Line: Use AI to support education, but prioritize cognitive engagement and ethical decision-making.





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**Thank
You.**

For Your Attention



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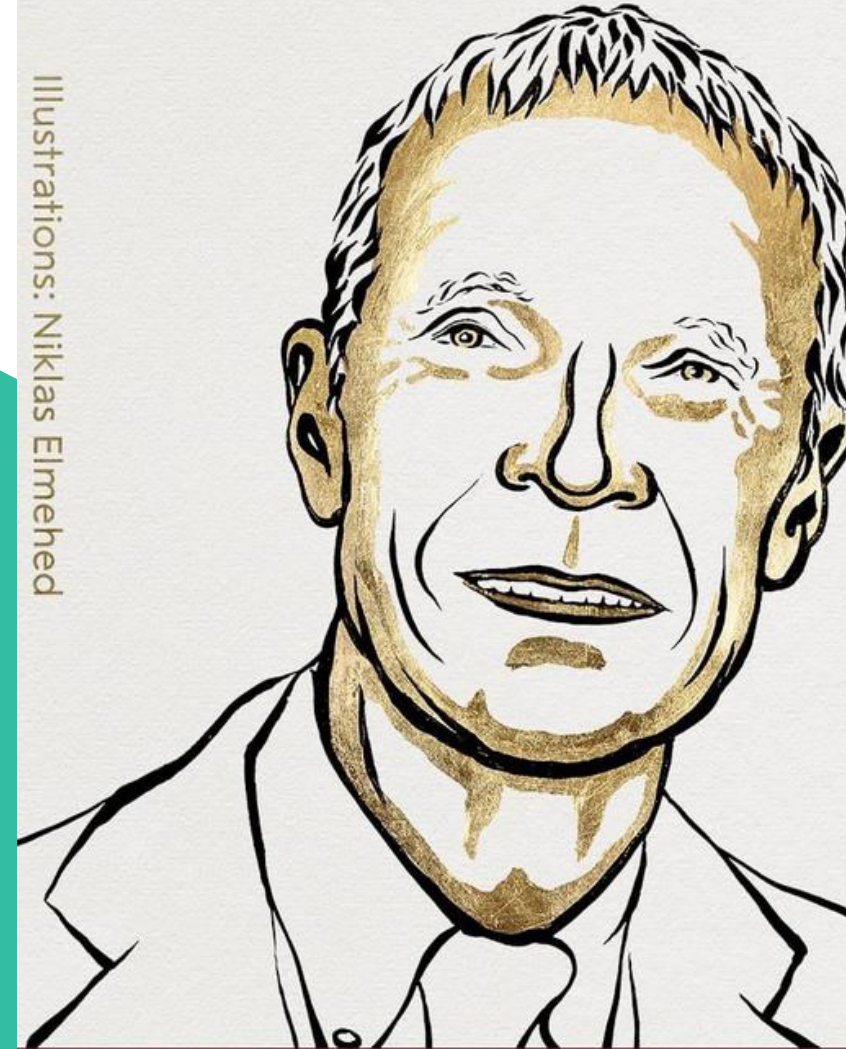
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THE NOBEL PRIZE
IN PHYSICS 2024

Illustrations: Niklas Elmehed



John J. Hopfield

Geoffrey E. Hinton

“for foundational discoveries and inventions
that enable machine learning
with artificial neural networks”

THE ROYAL SWEDISH ACADEMY OF SCIENCES