

Event location

Max Planck Institute for Brain Research
Max-von-Laue-Str. 4
60438 Frankfurt am Main | Germany

Registration

Please register for participation until 26 April 2024 at:
www.leopoldina.org/en/brain-research-and-language-models/

You can find detailed instructions on how to get there at:
www.brain.mpg.de/81234/how-to-get-here/

The Leopoldina originated in 1652 as a classical scholarly society and now has 1,600 members from almost all branches of science. In 2008, the Leopoldina was appointed as the German National Academy of Sciences and, in this capacity, was invested with two major objectives: representing the German scientific community internationally, and providing policymakers and the public with science-based advice.

The Leopoldina champions the freedom and appreciation of science. It promotes a scientifically enlightened society and the responsible application of scientific insight for the benefit of humankind and the natural world. In its interdisciplinary discourse, the Academy transcends thematic, political and cultural boundaries. It is also an advocate of human rights.



Brain Science and Large Language Models

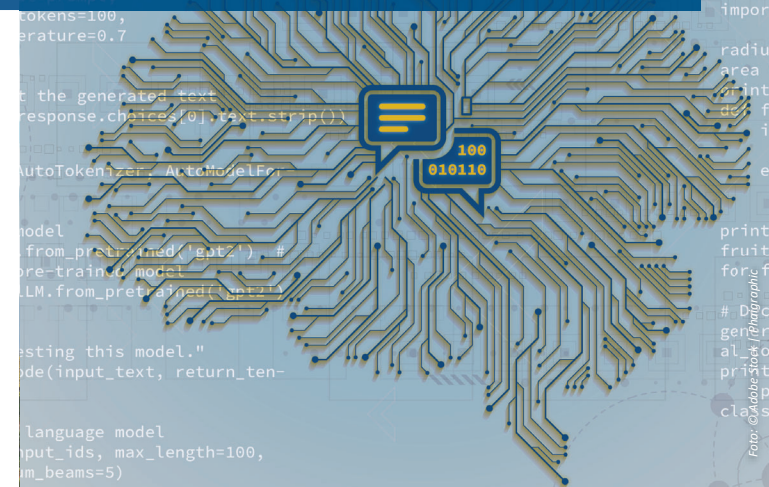
Symposium by Leopoldina and Max Planck Institute for Brain Research

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13-14 May 2024

Max Planck Institute for Brain Research
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Brain Science and Large Language Models: has a quantum leap occurred?

Recent advances in artificial intelligence (AI) have spurred both enthusiasm about the capabilities of the latest large language models (LLMs) and warnings about their ability to match or even surpass human intelligence. But do comparisons to the human brain hold when addressed from the perspective of neuroscience?

This symposium co-hosted by Leopoldina and MPI for Brain Research will bring together experts from computer science and neuroscience to discuss what has and has not been achieved with latest advances in AI. What are and how can we judge the capabilities of artificial systems compared to human intelligence? Which aspects of LLMs are similar and decisively dissimilar from the way the human brain works? By which tools can we inspect, measure and analyze the representation and capabilities of LLMs? Have LLMs learned a representation of language that shows similarities to the one generated by our human brains? How can LLMs inspire advances in brain science? Conversely, what aspects might be missing and could be used to improve current LLMs (and what does “improve” mean, in the first place)?

Day 1 – 13 May 2024

01:00 – 01:10 pm

Opening remarks

Prof. Dr. Moritz Helmstaedter
Max Planck Institute for Brain Research
Prof. Dr. Thomas Lengauer ML
Max Planck Institute for Informatics

01:10 – 02:00 pm

Neural Representations of Vision and Language in AI Models and the Brain

Prof. Haim Sompolinsky
Hebrew University/Harvard University

02:00 – 02:50 pm

Validating and improving LLMs as model organisms for human language processing

Prof. Dr. Mariya Toneva
Max Planck Institute for Software Systems

02:50 – 03:10 pm | Coffee break

03:10 – 04:00 pm

Deep language models as a cognitive model for natural language processing in the human brain

Prof. Uri Hasson
Princeton University

04:00 – 04:50 pm

TBA

Prof. Dr. Thomas Hofmann
ETH Zurich

04:50 – 05:10 pm | Coffee break

05:10 – 06:00 pm

The Debate Over “Understanding” in AI’s Large Language Models

Prof. Melanie Mitchell (zoom)
Santa Fe Institute

06:00 – 07:00 pm | Snacks + Drinks

07:00 – 08:30 pm

Panel discussion: preliminary synthesis

Discussants:
Prof. Alison Gopnik (zoom)
University of California, Berkeley
Prof. Uri Hasson
Princeton University
Prof. Dr. Thomas Hofmann
ETH Zurich
Prof. Melanie Mitchell (zoom)
Santa Fe Institute
Prof. Haim Sompolinsky
Hebrew University/Harvard University
Moderator: Prof. Dr. Moritz Helmstaedter

Day 2 – 14 May 2024

09:00 – 09:50 am

Neuroscience & (Generative) AI: The Long Road from Motivation to Maturation

Prof. Dr. Björn Ommer
Ludwig Maximilian University of Munich

09:50 – 10:40 am

Transmission versus truth, imitation versus innovation: What children can do that large language and language-and-vision models cannot (yet)

Eunice Yiu
University of California, Berkeley

10:40 – 11:00 am | Coffee break + Group photo

11:00 – 11:50 am

To be or not to be? On Emergent Abilities in Large Language Models

Prof. Dr. Iryna Gurevych ML
Technical University of Darmstadt

11:50 pm – end | Fingerfood buffet available

12:00 – 13:30 pm

Final panel discussion: implications and perspectives

Discussants:
Prof. Dr. Iryna Gurevych ML
Technical University of Darmstadt
Prof. Dr. Kristian Kersting
Technical University of Darmstadt
Prof. Dr. Klaus-Robert Müller ML
Technical University Berlin
Prof. Dr. Björn Ommer
Ludwig Maximilian University of Munich
Dr. Viola Priesemann
Max Planck Institute for Dynamics and Self-Organization
Prof. Dr. Gemma Roig
Goethe University Frankfurt
Dr. Wanja Wiese
Ruhr University Bochum
Moderator: Prof. Dr. Thomas Lengauer ML