Essay on Artificial Intelligence (AI)—or why the term AI is an unfortunate choice in German

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Abstract

Based on a number of selected criteria, including a proof by contradiction, this essay argues that Artificial Intelligence cannot exist. However, the technology previously referred to as AI is explicitly not being questioned. To avoid misunderstandings and prevent unrealistic expectations, things must be named appropriately. Artificial Intelligence (AI) as a technological term should therefore be rejected—a more appropriate term would be Machine Intelligence (MI).

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Initium (philosophical and technological preliminary remarks)

Hans-Juergen Heinrichs, May 23, 2001, www.deutschlandfunk.de/frankenstein-und-die-zukunft-des-kuenstlichen-menschen-100.html (accessed July 6, 2025): *"Humans are the only creatures that cannot find fulfillment in themselves. They constantly dream beyond themselves, and they try to project this evolutionary longing onto everything they encounter: onto natural history as well as the world history they have created, onto the development of social communities as well as their own personal development."*, Borrmann, Norbert: Frankenstein und die Zukunft des kuenstlichen Menschen (Frankenstein and the Future of Artificial Humans). Kreuzlingen, Munich: Hugendubel 2001.

Craig Martell, former Chief Digital and Artificial Intelligence Officer of the Pentagon, defines AI as follows: *"AI is statistics on a large scale. That's all it is. We count past data and use it to predict the future."*, Interview with Handelsblatt (a German daily newspaper) on July 4, 2023.

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Introduction

Basically, to decide whether Artificial Intelligence exists or can exist at all, it is sufficient to answer the simple question:

- **Is the brain part of the body?**

Reasonable people cannot answer this question in the negative! However, affirming this question immediately leads to the acceptance that natural intelligence essentially requires the entire body to function and is therefore designed and influenced accordingly, as well as having been shaped by billions of years of evolution. In this respect, there can be no Artificial Intelligence without access to a 1:1 replica of human bodies.

On the next page of this essay, the following arguments regarding the impossibility of Artificial Intelligence are explored in greater depth in the form of a **proof by contradiction** and a **deduction**:

- No matter how you look at it or discuss it in a highly scholarly manner, in German the term intelligence is associated with the unconscious and conscious creative mental abilities of humans (cognitions, emotions, etc.). When we talk about Artificial Intelligence in German, we can only mean the artificial equivalence of those abilities, specifically in terms of their nature (as a thing in itself), not as a representation based on empirical studies of the symptoms—**the replication of natural intelligence fails due to the inability of humans to recognize and model things in themselves.**
- Well aware of the difficulties involved in realizing Artificial Intelligence, but nevertheless wishing to bask in its glory, experts have divided the subject of Artificial Intelligence into Strong Artificial Intelligence (the so-called holistic view), whose understanding is still quite nebulous at present, and Weak Artificial Intelligence (the so-called functional or methodological view), which is currently the focus of attention—**natural intelligence is indivisible, so there can be no division into Strong and Weak Artificial Intelligence.**

Furthermore, the next page will make it clear that in brain-dead people, intelligence that once existed is probably lost forever and cannot be artificially revived.

Overall, the term Artificial Intelligence (AI) does not seem to be appropriate in German! However, the technology it describes does represent a milestone for its intended use, as can be seen on the next but one page of this essay. Should this technology then not be referred to generally as **Machine Intelligence (MI)** instead?

Proof by contradiction (reductio ad absurdum) of Artificial Intelligence

In a first approximation, the creation of Artificial Intelligence requires comprehensive knowledge of the nature of natural intelligence. According to epistemology (see: Immanuel Kant), however, no human being is capable of recognizing the nature of natural intelligence (as a thing in itself)—so Artificial Intelligence cannot be created in this way.

Assumption: Alternatively, Artificial Intelligence can be implemented either on the basis of a complete and conclusive representation or at least on the basis of partial representations of the manifestations of natural intelligence.

Contradiction: With only incomplete knowledge of the nature of natural intelligence on the one hand (see: epistemology), the representation of its manifestations can never be complete and conclusive on the other! Moreover, because natural intelligence (as a thing in itself) is unknown and therefore **indivisible** (unknown divided by known remains unknown), it is also impossible to represent even partial manifestations of it.

As a result, according to *reductio ad absurdum*, Artificial Intelligence cannot exist—only equivalencies to empirically determinable manifestations of natural intelligence can be represented. However, implementations of these equivalencies can **never be designated as artificially intelligent** because:

- as described above, in order to realize Artificial Intelligence, it is absolutely essential that, in the absence of knowledge about the nature of natural intelligence, its manifestations can be represented completely and conclusively, or at least partially,
- the implementations currently referred to as Artificial Intelligence are merely **1:1 (algorithmic) representations of assumed natural intelligence** (see: next page) and are therefore not based on conscious or unconscious, creative, and, in case of doubt, **non-algorithmic** processes—and nothing else is to be expected at present.

Deduction

Unlike empirical sciences such as mathematics or physics, there can be no axioms for Artificial Intelligence, as natural intelligence is indivisible and therefore cannot be determined by deductive logic (see: 1+1=2 [as an axiomatic basis of mathematics]).

Assumption

Perhaps the term *"Intelligence" in "Artificial Intelligence"* (see: en.wikipedia.org/wiki/Dartmouth_Conference [accessed: July 6, 2025]) should probably be interpreted more as information gathering. Artificial Information Gathering (i.e., statistics) would then characterize the area in question better than Artificial Intelligence, see: above and next page.

Intelligence may correlate with the current energy state of the brain. This results from the physical/chemical properties of the brain. The total energy currently acting in the brain is composed of all possible forms of energy (examples of forms of energy are: kinetic energy, chemical energy, thermal energy, electrical energy, or potential energy). So, in simple terms: when climbing stairs, you are more intelligent than when descending stairs—or vice versa; in the heat, you are more intelligent than in the cold—or vice versa; if you have snorted cocaine, you are more intelligent than if you haven't—or vice versa; etc. Energetically, the brain is not a closed system and is therefore exposed to external interactions. Accordingly, intelligence is more than the sum of the endogenous physical/chemical interactions in the brain. This means that if only one structural element or form of energy were missing endogenously or exogenously, or if their interaction were lacking, then there might be no intelligence or a different kind of intelligence.

In addition, every biological nerve synapse is determined by an unknown number (or at least a large number) of parameters. It is therefore questionable to compare the one-dimensional Sigmoid, ReLu, or other activations of neural networks with biological nervous systems!

Roger Penrose, who later received the Nobel Prize in Physics, argued in his book *"The Emperor's New Mind: Concerning Computers, Minds and The Laws of Physics"*, Oxford University Press, 1989, Chapter 1, that for the reasons mentioned above, there will never be a *"beam me up"* (see: Star Trek) for humans, because even if the body could be disassembled, transferred, and reassembled, intelligence would definitely be lost in the process—because it is anchored in the living body, in the here and now.

Outline (one-pager) on Artificial Intelligence

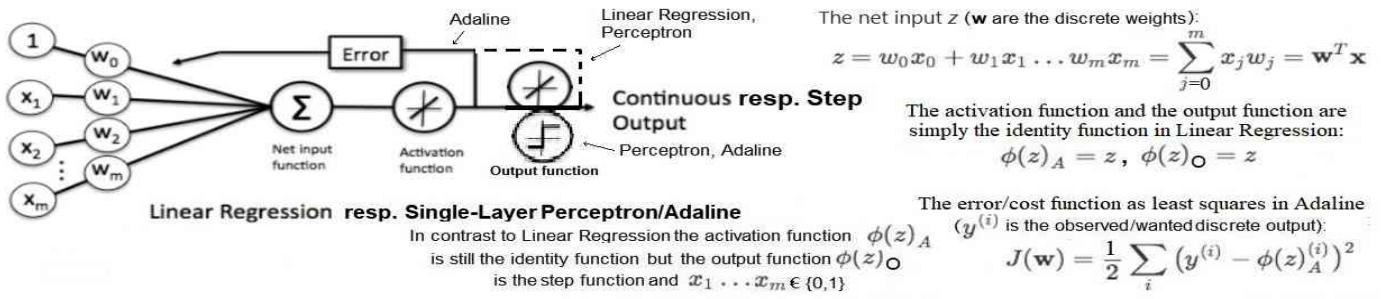
How natural intelligence manifests itself has not yet been conclusively clarified. Furthermore, there is not even a rudimentary description of the nature of natural intelligence itself.

Such incomplete knowledge about intelligence is an indication that Artificial Intelligence (AI) cannot exist alongside natural intelligence. However, there is a media hype surrounding Artificial Intelligence. **But:** *"99% of the economic value that AI creates today is generated by the type of AI that learns from A to B through input-to-output mappings."*, Andrew Ng, landing.ai/videos/andrew-ng-enterprise-ai-strategy-with-landing-ai-cxotalk-365 (accessed: July 6, 2025).

In practice, Artificial Intelligence today and for the foreseeable future is nothing more than "supervised machine learning," i.e., classification or regression based on input data, in particular supported by ANN (Artificial Neural Networks)—other supervised machine learning algorithms include: Naive Bayes, Decision Trees, Regression Trees.

Among other things, with CNN (Convolutional Neural Networks), an improvement of ANN, and the matured parallelized computer architectures (including GPUs and TPUs)—to provide the necessary computing power—so-called AI applications have now made their breakthrough. Currently, AI applications are therefore essentially based on neural networks. However, the basic form of neural networks, the single-layer Perceptron with linear activation, is not a representation of a biological neuron (as is often assumed), but ultimately nothing more than an extension of a linear classifier/discriminator, which Carl Friedrich Gauss (the German mathematician) was already familiar with around the year 1800 (see: figure below)!

Model of Linear Regression in statistics with distinction from the Perceptron/Adaline in AI



Minimization of the error or cost function $J(w)$, known in AI as learning or training, is achieved by adjusting the weights w_j. The disadvantage of the Perceptron is that a training data set that cannot be separated linearly would prevent the learning phase from converging. In such cases, the Adaline, an extension of the Perceptron, provides a remedy, in which the error or cost function $J(w)$ refers to the continuous data of the activation function and no longer, as in the Perceptron, to the step data of the output function, see: figure above.

According to the figure above, the Linear Regression of statistics and the single-layer Perceptron/Adaline of AI differ primarily in the form of the output function (identity vs. step function). In this respect, all constructed references of AI applications to the human brain are merely pseudo-biological in nature—see: anthropomorphism (paradoxically, such one-dimensional comparisons do not testify to the greater natural intelligence of the comparer, because even an airplane, for example, has nothing to do with a bird, even though it has wings)! In other words, AI applications are simply software applications that have learned or are learning from data in a supervised manner—no more and no less.

In appropriate fields of application, a paradigm shift has therefore taken place in software applications—away from the programmatic formulation of conditions and toward a more statistical evaluation of data. The main implementation effort for such applications is therefore no longer in programming activities, but in training neural networks—for the case in question (see: figure above) in the appropriate setting of the weights w_j, i.e., in minimizing the error or cost function $J(w)$. As shown above, the learning problem $J(w)$ can be described using the least squares method (quadratic functions are characterized by the fact that large data deviations are weighted more heavily than small ones; they are also differentiable and have a minimum). Gradient descent methods are then preferably used for the general numerical solution of the minimization problem of the least squares method.

Conclusion on Artificial Intelligence

Two things are missing for the creation of Artificial Intelligence (AI):

- the ability to understand natural intelligence at all (see: epistemology)
- the means and tools to replicate natural intelligence (possibly on a non-algorithmic basis)

Mathematics and physics are empirical sciences and are based on axioms (e.g., it is unknown why 1+1=2, so it is assumed axiomatically because it seems to be the case, although it is not unlikely that tomorrow it could be completely different). Since natural intelligence is indivisible, there can be no axiomatic basis for developing AI—with the consequence that the Turing test (see: en.wikipedia.org/wiki/Turing_test [accessed: July 6, 2025]) is unsuitable for determining natural intelligence due to its axiomatic approach.

Weather conditions are chaotic over the long term and in increasing detail. In chaotic systems, it is difficult to derive reliable statements from patterns (see also: Hundred-Year Calendar and various farmers' rules). Therefore, AI, which is statistical in nature, should be questioned as a tool for weather forecasting.

Some autistic people have a special talent for pattern recognition—does that make them particularly intelligent?

It is preferable to name things adequately. This essay has shown that Artificial Intelligence (AI) cannot exist—therefore, such a designation is misleading, with the result that the public is promised unrealizable possibilities and discrimination occurs against those segments of the population who are not so technologically savvy and who, as a result, imagine something that is intellectually superior. Why is the term **Machine Intelligence (MI)** not commonly used for the technology in question (as is already the case in some areas of application)? Is it hubris and/or marketing that prevents this?

Colophon (outlook and concluding remarks)

Presented on a single page each, this essay offers a philosophical and technological overview of Artificial Intelligence, aimed at both experts and laypeople—leading to a rejection of the term “Artificial Intelligence” (AI) previously used for this subject area in German. In order to cater to the breadth of the target audience, i.e., to offer an appropriate, balanced relationship between clarity and detail, this essay focuses primarily on epistemological proof by contradiction on the philosophical side and on the fundamentals of neural networks on the technological side.

Interested readers should substantiate the statements in the above section **Conclusion on Artificial Intelligence** with further studies in a broader context.

The sometimes astonishing results of so-called generative AI (see: en.wikipedia.org/wiki/Generative_artificial_intelligence [accessed: November 15, 2025]) are also based on algorithms and the availability of very high computing power.