Artificial Intelligence… – Error Scenarios

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Abstract

In this paper we will consider a few more (typical) error scenarios for AI problems, comparing the currently used statistic with a dimensional one. We directly build upon our previous publication [A1]. For convenience we here repeat the corresponding abstract:

Two main aspects are hindering Artificial Intelligence, AI, to perform as effective as the human brain.

A) The current AI-core is based on linearity
B) AI does not correctly handle statistics

While the first problem would require a complete exchange of the internal workings of the artificial neuronal networks (still feasible with a math fix), the second problem can be corrected by an incorporation of a dimensionally based (quantum gravity derived) statistical framework. In this paper we are considering only the effects of the latter problem.

Abstract Reference

[1] N. Schwarzer, "Artificial Intelligence and Why We Are Still Smarter… Well, Some of Us?", 2026, a SIO publication, www.siomec.com

The Effect of a Wrong Statistic

We concentrate on two typical practical problems.

At first we investigate the question of a linear dimensional dependency of the error within a statistical system and compare the two cases where a) the dimensionality is properly taken into account and b) where just the classical (von Neumann) statistic is been used.

In the first figure (figure 1), we assume to have no knowledge about the system's behavior regarding very high dimensionality, while in the second case (figure 2) some external knowledge is available to help us to take this systematic error into account. Such knowledge could just be a known closed form solution about certain behavioral patterns in infinitely dimensional spaces or empirical knowledge.

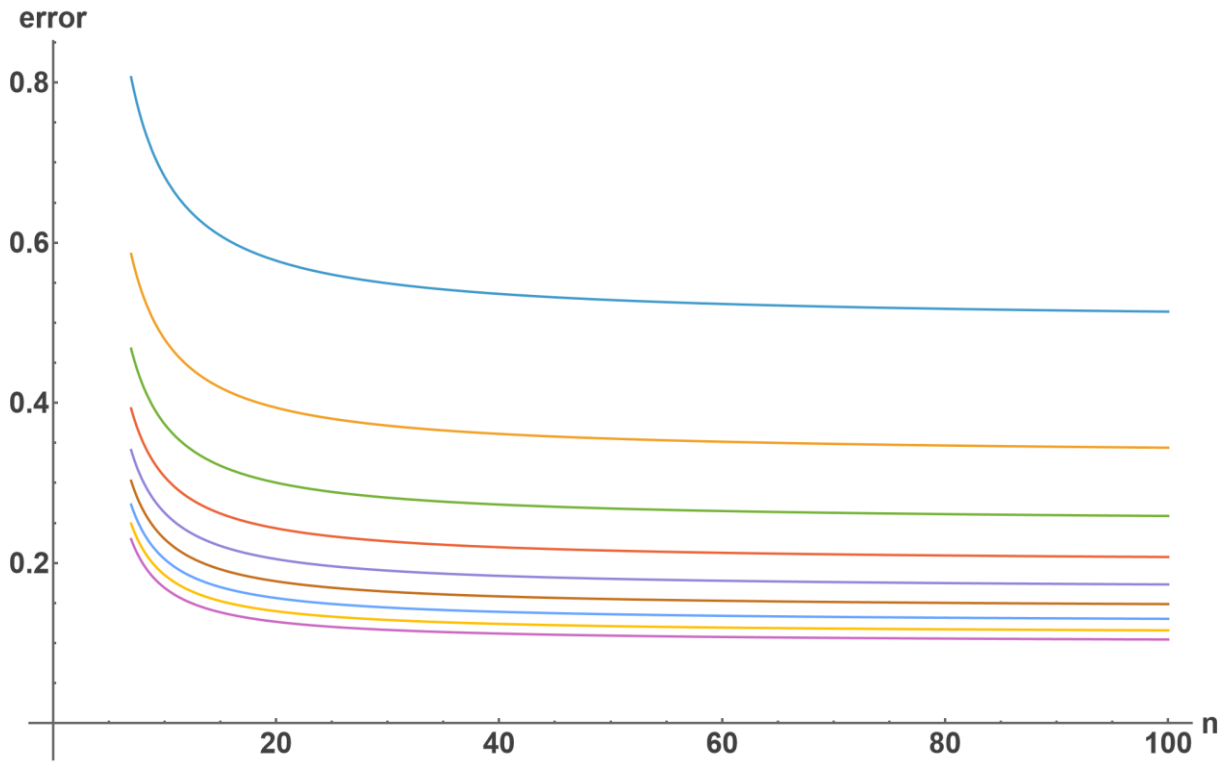

Fig. 1: Systematic error due to lack of knowledge of asymptotic behavior for large dimensionality.

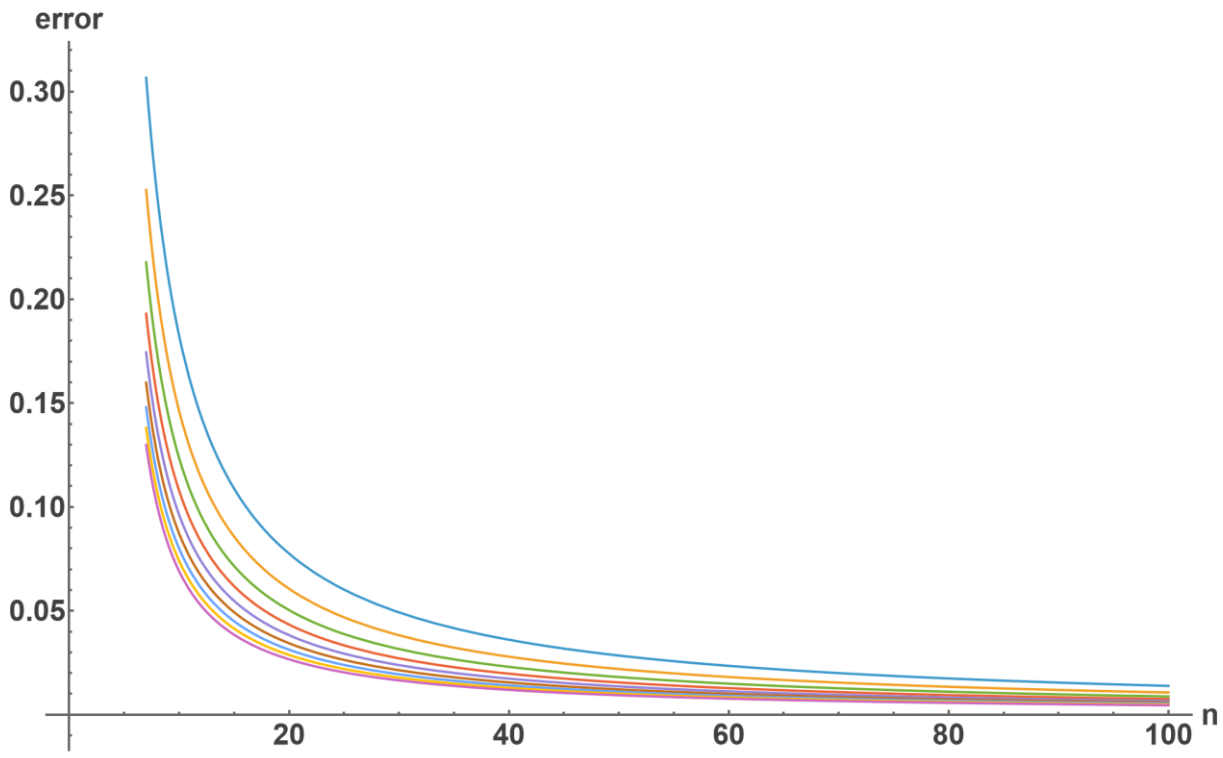

Fig. 2: No systematic error due to knowledge of asymptotic behavior for large dimensionality.

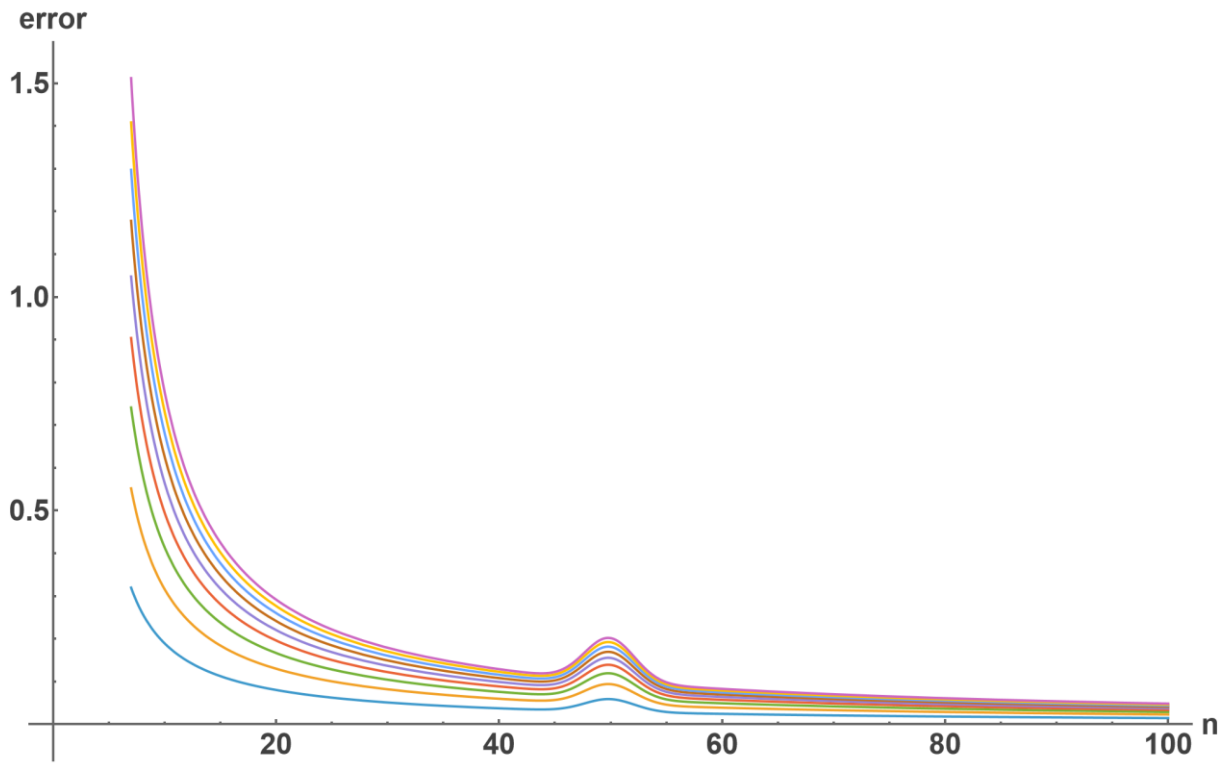

Fig. 3: Constellation of fig. 2 with additional error source due to higher uncertainty in the vicinity of a certain dimensionality (here n=50).

While we might see case one (figure 1) as a good explanation for AI-systems (LLMs) completely "losing their footing" when being confronted with systems dramatically increasing in size

(degrees of freedom = dimensionality), we have definitively a good model in the third case (figure 3) for those situations where the AI-systems face a lack in training data in a distinct sub-domain, surrounding a critical dimensionality. With the correct statistical tools at hand these effects could be explained, mitigated and potentially corrected.

For further information, we refer to the references of [A1]

And What is our Finding Good For? Some Keywords

- AI-race
- Key ingredient for smartly deflating the AI-bubble and harvesting the 136 trillion in there
- Dramatic cost-reduction for LLM training (currently over 100 million US$)
- Increase of energy-efficiency
- Path towards a Natural – Artificial – Intelligence
- Lower error number
- Higher artificial creativity
- ...

References to [A1]

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