AI Perception vs. Reality

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How should we challenge exaggerated claims about AI's capabilities and set realistic expectations?

Main Takeaways

- Over the last 70 years, against a background of constant delivery of new and important technologies, many AI innovations have generated excessive hype.

- Like other technologies these hype trends have followed the general Gartner Hype Cycle characterization.

- The current Generative AI Hype Cycle is the first introduction to AI for perhaps the majority of people in the world and they do not have the tools to gauge the validity of many claims.

Context & History

Artificial intelligence, or AI, is the field that studies the synthesis and analysis of computational agents that act intelligently [6]. AI has gone through hype cycles multiple times since the 1956 workshop that established the name AI and set the course for early computer science departments to include AI as a major component of their research and teaching. All hype bubbles eventually burst, as the essence of hype is that it is beyond reality. Over the decades this has led to AI winters where funding has dried up for all of AI or for specific aspects of AI such as neural networks or robotics.

A study published 2017 on trends with the public perception of AI over a 30-year period found that discussion about AI had sharply increased since 2009 and that discussions in the public press had been consistently more optimistic than pessimistic [4]. The study also found that hopes about AI applications of AI in healthcare and education were increasing over time. Another finding was that concerns were growing about loss of control of AI, ethical implications, and the negative impact of AI on work.

Perhaps the difference in recent years with prior periods is that hype has gone beyond the pages of academic conferences, conference papers, and scientific magazines, out into both the mainstream media, and social media. AI and Artificial Intelligence have become common words that non-technical people have heard about and a common subject for leaders of almost all countries to talk about. Governments, for the first time, have AI policies.

One of the problems is that AI is actually a wide-reaching term that can be used in many different ways. But now in common parlance it is used as if it refers to a single thing. In their 2024 book [5] Narayanan and Kapoor likened it to the language of transport having only one noun, 'vehicle', say, to refer to bicycles, skate boards, nuclear submarines, rockets, automobiles, 18 wheeled trucks, container ships, etc. It is impossible to say almost anything about 'vehicles' and their capabilities in those circumstances, as anything one says will be true for only a small fraction of all 'vehicles'. This lack of distinction compounds the problem of hype, as particular statements get overgeneralized.

The hype also sets expectations for ordinary people. Many are fearful that they will lose their jobs to AI in the short term. Social scientists then work to solve labor disruptions, e.g., for displaced truck drivers [6], based on predictions about AI (and in this case, self-driving trucks) and its adoption that turn out to be wildly optimistic. There are no deployed self-driving trucks in the predicted time frame.

Hype in response to a technology trigger is not restricted to AI. Indeed the business intelligence company Gartner, has deliberately made a practice of using a graphical representation of hype levels through five stages that are common for many technologies: (1) technology trigger, (2) peak of inflated expectations, (3) trough of disillusionment, (4) slope of enlightenment, and (5) plateau of productivity. They have used this framework to track many technologies, including quantum computers, block chain, autonomous vehicles, nano-technology, etc. In November 2024 they [1] estimated that hype for Generative AI had just passed its peak and was on the downswing.

The question for AI professionals is how to respond to this hype, how to question it, and how to help others understand what is hubris, while maintaining their own intellectual modesty and probity. This is hard to do in the middle of outsized claims about one's own field, and often it is up to future historians to carefully dissect past scientific arguments.

Historian Thomas Haigh has tried to do such a dissection, almost in real time, in a recent series of articles in the Communications of the ACM. In [2] he gives a post-mortem on the impact of over-hype in AI that resulted in what is known as the AI-winter in the 1980s. His one line summary is: "Fallout from an exploding bubble of hype triggered the real AI Winter in the late 1980s." In [3] he makes a comparison between the hype of today and of those earlier times. He summarizes this particular opinion piece with the line: "From engines of logic to engines of bullshit?"

Research Challenges

Many of us who have worked in AI for decades face the challenge of trying to remain honest brokers when we see that many of the public statements of people quite new to the field are out of line with reality.

The big question is whether, given the dynamics of social media and the search for clicks, professional opinions and peer reviewed research papers have any impact on dampening the overclaims and the ways they distort common understanding of where AI is, and what is its potential in one year, five years, ten years, etc.

If we are currently left out of the conversations how can we change that?

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4. Fast, E. and Horvitz, E. [2017]. Long-term trends in the public perception of artificial intelligence, AAAI'17: Proceedings of the Thirty-First AAAI Conference on Artificial Intelligence, February 4, 2017, pp 963–969. https://ojs.aaai.org/index.php/AAAI/article/view/10635

5. Narayanan, A. and Kapoor, S. [2024]. AI Snake Oil: What Artificial Intelligence Can Do, What It Can't, and How to Tell the Difference. Princeton University Press.

6. Poole, D. L. and Mackworth, A. K. [2023]. Artificial Intelligence: Foundations of Computational Agents, 3rd edition. Cambridge University Press.

7. Wang, S., Mack, E. A., Van Fossen, J. A., Medwid, M., Cotten, S. R., Chang, C. H., Mann, J., Miller, S. R., Savolainen, P.T. and Baker, N. [2023]. Assessing alternative occupations for truck drivers in an emerging era of autonomous vehicles. Transportation Research Interdisciplinary Perspectives, Vol 19. May. https://doi.org/10.1016/j.trip.2023.100793

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COMMUNITY OPINION 💬

The Community Survey gives perspectives on the reactions to the AI Perception vs Reality theme. First, the results of the survey are summarized here. 36% of the survey respondents chose to answer the questions for this theme. This is the summary breakdown of the responses to each question:

1. How relevant is this Theme for your own research? 72% of respondents said it was somewhat relevant (24%), relevant (29%) or very relevant (19%).

2. The current perception of AI capabilities matches the reality of AI research and development. 79% of respondents disagreed (47%) or strongly disagreed (32%).

3. In what way is the mismatch hindering AI research? 90% of respondents agreed that it is hindering research: 74% agreeing that the directions of AI research are driven by the hype, 12% saying that theoretical AI research is suffering as a result, and 4% saying that less students are interested in academic research.

4. Should there be a community-driven initiative to counter the hype by fact-checking claims about AI? 78% yes; 51% agree and 27% strongly agree.

5. Should there be a community-driven initiative to organize public debates on AI perception vs reality, with video recordings to be made available to all? 74% yes; 46% agree and 28% strongly agree.

6. Should there be a community-driven initiative to build and maintain a repository of predictions about future AI's capabilities, to be checked regularly for validating their accuracy? 59% yes; 40% agree and 29% strongly agree.

7. Should there be a community-driven initiative to educate the public (including the press and the VCs) about the diversity of AI techniques and research areas? 87% yes; 45% agree and 42% strongly agree.

8. Should there be a community-driven initiative to develop a method to produce an annual rating of the maturity of the AI technology for several tasks? 61% yes; 42% agree and 19% strongly agree.

Since the respondents to this theme are self-selected (about a third of all respondents), that bias must be kept in mind. Of those who responded, a strong and consistent (though not completely monolithic) portion felt that the current perception of AI capabilities was overblown, that it had a real impact on the field, and that the field should find a way to educate people about the realities.