Analyzing AI Hype: Past and Present Booms

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Artificial Intelligence (AI) has captured the public's imagination for more than a year, breaking into the general discourse with the release of ChatGPT by the (formerly) non-profit OpenAI. What many of those interested in it are however not aware of that this situation, as novel as it may seem, is only a repeat of theater-play that has been going on since (most likely) before their birth. In this essay I will look into past AI boom cycles and show parallels to other promising technologies that may help explain the current hype, and hint at future developments.

It might also show aspects of our relationship with technology and science in general. The cyclical journey of AI through periods of intense enthusiasm and subsequent disillusionment provides a fascinating lens through which to view the evolution of technology and its societal implications. The inception of AI can be traced back to the pioneering work of Warren McCulloch and Walter Pitts in 1943, who proposed a model of artificial neurons based on a combination of knowledge from neuroscience, formal logic, and computation theory. This model laid the groundwork for the first neural network computer, constructed by Marvin Minsky and Dean Edmonds at Harvard in 1950, marking a seminal moment in the development of AI (Russell & Norvig, 2016).

The early achievements of AI, though modest by today's standards, were groundbreaking for their time. Computers, previously regarded as mere calculators, began performing tasks that bore a resemblance to human cognition, challenging prevailing assumptions about the capabilities of machines. This era, often referred to by John McCarthy as the "Look, Ma, no hands!" period, was characterized by a series of demonstrations where AI systems performed tasks previously thought to be exclusive to human intelligence.

However, the optimism of AI researchers, as epitomized by Herbert Simon's bold predictions in 1957[1], often outpaced the actual progress of the technology. Simon's forecasts, including a

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[1]"On the basis of these developments, and the speed with which research in the field is progressing, I am willing to make the following predictions, to be realized within the next ten years. [i.e., by 1967] 1. That within ten years a digital computer will be the world's chess champion, unless rules bar it from competition. 2. That within ten years a digital computer will discover and prove an important mathematical theorem. 3. That within ten years a digital computer will write music that will be accepted by critics as possessing considerable aesthetic value. 4. That within ten years most theories in psychology will take the form of computer programs, or qualitative statements about the characteristics of computer programs."

computer becoming a chess champion and proving significant mathematical theorems within a decade, were not realized within his optimistic timeframe. Instead, they materialized over a span of 40 years, highlighting a pattern of overestimation that has recurred throughout AI's history. This tendency for overconfidence was largely due to the promising yet limited performance of early AI systems on simple tasks, which did not scale to more complex problems as anticipated (Natale & Ballatore, 2020).

The phenomenon of AI hype is not unique to this field but is part of a broader pattern observed across various technological domains. Research into hype cycles reveals that many technologies, including biotechnology, self-driving vehicles, and hydrogen fuel cells, undergo similar trajectories of inflated expectations followed by periods of disillusionment (Annette Ruef et al., 2010; Fox, 2018; Stilgoe, 2018). These cycles are characterized by a surge in media attention and investment driven by high expectations, which eventually confront the reality of technological challenges and limitations.

The concept of 'hype' in technology encompasses the dynamics of expectations that shape the development and adoption of new innovations. High expectations can mobilize resources, attract stakeholders, and confer legitimacy on emerging technologies. However, when these expectations exceed the actual capabilities of the technology, they can lead to an 'overshoot' that undermines credibility and leads to disillusionment. This pattern is well-documented in both business and academic studies, with consultancy firms developing models such as the Gartner hype cycle to navigate these dynamics. Science, Technology, and Innovation Studies have further enriched our understanding by examining the performative nature of hype and its impact on innovation processes (Borup et al., 2006).

In the context of AI, the current wave of enthusiasm must be critically examined against the backdrop of these historical cycles. While the potential of AI to transform industries, healthcare, and daily life is undeniable, the lessons from past hype cycles caution against unchecked optimism. The interplay between media narratives, public expectations, and technological development shapes the trajectory of AI, making it imperative to foster a balanced discourse that acknowledges both the potential and the limitations of AI technology.

By situating the current state of AI within this historical and sociological framework, we gain valuable insights into the forces that drive technological hype and the complex interplay between innovation, societal expectations, and media narratives. This perspective not only enriches our understanding of AI's development but also informs a more nuanced approach to navigating its future trajectory.

What is the state of the art of hype cycles in technological research?

In the realm of technological innovation, the concept of hype cycles plays a crucial role in shaping the trajectory of emerging technologies. These cycles, characterized by fluctuating levels of public and investor interest, significantly impact the development, adoption, and eventual maturation of technologies. The theory of hype cycles, initially conceptualized by

Gartner, a leading research and advisory company, provides a framework for understanding these fluctuations. According to Gartner, technologies typically pass through five phases: the "Technology Trigger," "Peak of Inflated Expectations," "Trough of Disillusionment," "Slope of Enlightenment," and finally, the "Plateau of Productivity" (van Lente et al., 2013). This model helps stakeholders navigate the complex dynamics of technological evolution, offering insights into when to invest, when to develop, and when to implement new technologies.

The consequences of hype are multifaceted. On one hand, heightened expectations can drive rapid advancements and innovation by attracting investment and talent to the field. On the other hand, unrealistic expectations can lead to disappointment and disillusionment, potentially stalling progress and deterring future investment. The study of hype cycles, therefore, is not merely an academic exercise but a practical tool for managing the lifecycle of technological innovations.

The current state of artificial intelligence (AI) serves as a prime example of a technology navigating through its hype cycle. AI has experienced several waves of heightened expectations followed by periods of disillusionment since its inception in the mid-20th century. Each cycle has been driven by breakthroughs in technology, such as the development of neural networks and deep learning algorithms, which have periodically reignited the public and investors' imaginations about the potential of AI. However, these periods of enthusiasm have often been followed by setbacks, as the challenges of implementing AI in practical, real-world applications become apparent (Stilgoe, 2018).

The sociological perspective offers a unique lens through which to examine hype cycles, emphasizing the social dynamics and institutional practices that contribute to the rise and fall of technological expectations. Sociologists have highlighted how hype not only reflects but also shapes technological development, influencing which projects receive funding, which research directions are pursued, and how technologies are ultimately implemented in society. This perspective underscores the importance of critically examining the social processes that underlie technological hype, moving beyond individual technologies to consider the broader socio-technical systems in which they are embedded (Joyce et al., 2021).

Moreover, the interplay between media narratives, public expectations, and technological development is critical in shaping the trajectory of AI and other emerging technologies. Media representations can amplify the perceived potential of technologies, contributing to the peak of inflated expectations, while also playing a role in the subsequent disillusionment as challenges and limitations become more apparent. Understanding this dynamic is essential for navigating the hype cycle effectively, ensuring that technologies can progress toward their plateau of productivity without being unduly hindered by unrealistic expectations or premature disillusionment (Natale & Ballatore, 2020).

How has Sociology Engaged with AI During its Past Heydays?

The intersection of sociology and artificial intelligence (AI) is not a novel area of inquiry. Historical engagement with AI by sociologists has been profound, offering critical insights into the sociotechnical dynamics of this emerging technology. Steve Woolgar's seminal work in the mid-1980s laid the groundwork for a sociological perspective on AI, challenging the prevailing dichotomies between human intelligence and machine capabilities. Woolgar argued for a sociology that goes beyond merely adopting the discourse of AI, advocating instead for an empirical investigation into the distinctions and relationships that characterize the human-machine interface. This involves scrutinizing the public pronouncements of AI proponents in relation to the day-to-day activities of AI researchers, thereby uncovering the social processes underpinning the development of AI (Woolgar, 1985).

Woolgar's call for a sociology of machines proposed a radical reevaluation of the basic axioms of sociology, particularly the assumption that human behavior is distinctively 'social' and fundamentally different from machine activity. This challenge to sociological orthodoxy invites a reconsideration of our understanding of behavior, action, and agency, urging sociologists to question why the discipline has traditionally excluded machine-like activity from its purview. The advent of AI, with its attempts to replicate or simulate human intelligence, provides a unique empirical opportunity to probe the limits of the distinction between human behavior and machine activity. Woolgar's work thus sets the stage for a broader inquiry into the social dimensions of AI, encouraging sociologists to explore how societal conceptions of intelligence and machine activity shape our understanding of technology and its implications for society.

Contemporary sociological research on AI mirrors Woolgar's early insights, extending the analysis to the complex interplay between AI technologies, societal expectations, and the media narratives that shape public perceptions of AI. Recent studies have emphasized the importance of examining the social shaping of AI in practice, highlighting how AI systems are embedded within broader sociotechnical systems that reflect and reproduce societal values, power dynamics, and inequalities (Joyce et al., 2021). This body of work builds on Woolgar's foundational arguments, employing sociological theories and methods to analyze how AI technologies are developed, implemented, and understood within specific social, cultural, and institutional contexts.

In summary, the engagement of sociology with AI, from its early days to the present, reflects a continuous effort to unpack the sociotechnical entanglements of AI technologies. By drawing on Woolgar's pioneering work and its contemporary extensions, sociologists are well-positioned to contribute critical insights into the development and societal implications of AI, challenging simplistic narratives and highlighting the complex realities of AI as a sociotechnical phenomenon.

Current Societal and Media Perspectives on AI

The contemporary societal and media landscape is saturated with discussions about artificial intelligence (AI), often painting a picture of a future radically transformed by AI technologies. This narrative is not without its merits, as AI has indeed made significant strides in various fields, from healthcare diagnostics to autonomous vehicles. However, the intensity and nature of the current discourse around AI bear the hallmarks of a hype period, characterized by inflated expectations and speculative projections about the technology's potential impact on society.

A critical examination of media reports and public discourse reveals a pattern of sensationalism and optimism that frequently overshadows the nuanced realities of AI development and implementation. For instance, headlines often tout AI's capabilities in surpassing human performance in specific tasks, such as game playing or image recognition, without acknowledging the limitations of these systems in more complex, real-world scenarios. This portrayal contributes to a public perception of AI as an omnipotent force poised to revolutionize every aspect of human life, from work to social interactions (Stilgoe, 2018).

However, a nuanced approach is necessary to distinguish between the possible and the not possible in AI. While AI technologies have indeed advanced significantly, their current capabilities are often more limited than media narratives suggest. For example, AI systems excel in tasks with clear rules and objectives but struggle with ambiguity, context, and tasks requiring common sense or ethical judgment. This discrepancy between the hype and the reality of AI underscores the importance of critically evaluating the claims made about AI's potential and the societal implications of its widespread adoption (Natale & Ballatore, 2020).

Moreover, the current hype around AI is not merely a matter of media sensationalism but is also influenced by the interests of various stakeholders, including tech companies, investors, and policymakers. These actors have a vested interest in promoting an optimistic view of AI, as it can attract investment, drive research and development, and shape policy agendas. However, this promotion often glosses over the challenges and risks associated with AI, including ethical concerns, potential job displacement, and the exacerbation of social inequalities (Joyce et al., 2021).

In conclusion, while the current societal and media perspectives on AI reflect a period of hype, it is crucial to adopt a critical and nuanced approach to understanding AI's capabilities and limitations. By examining the evidence behind the claims made about AI and considering the interests driving the hype, we can develop a more balanced and informed view of AI's potential role in society. This approach not only helps temper unrealistic expectations but also highlights the areas where AI can genuinely contribute to addressing societal challenges, guiding the development and implementation of AI technologies in a responsible and equitable manner.

AI's Impact Beyond Hype

The cyclical nature of AI's development, characterized by alternating periods of hype and disillusionment, has been a recurring theme in its history. Despite this, the impact of AI on society, particularly in the job market and societal perceptions of job value, is profound and undeniable. The current discourse surrounding AI, while echoing past enthusiasms, brings to light the enduring significance of AI in driving societal change. This conclusion draws upon the insights provided by sociological engagement with AI, emphasizing the need for a nuanced understanding of AI's potential and limitations.

The sociological perspective, as discussed in previous sections, offers a critical lens through which to view the interplay between technological innovation and societal expectations. It highlights the importance of examining the social shaping of AI in practice, recognizing that AI technologies are embedded within broader sociotechnical systems that reflect and reproduce societal values, power dynamics, and inequalities. By situating AI within this framework, we can better understand the complex realities of AI as a phenomenon that is both shaped by and shaping society (Joyce et al., 2021).

Moreover, the current hype surrounding AI, fueled by media narratives and the interests of various stakeholders, shows the need for a critical evaluation of the claims made about AI's potential. While AI technologies have indeed advanced significantly, their capabilities are often more limited than popular narratives suggest. This discrepancy between hype and reality necessitates a balanced approach to AI discourse, one that acknowledges both the potential benefits and the challenges and risks associated with AI. By doing so, we can foster a more informed and responsible development and implementation of AI technologies, ensuring that they contribute to addressing societal challenges in an equitable manner (Natale & Ballatore, 2020).

Furthermore, the impact of AI on the job market and societal perceptions of job value is a critical area of concern. While AI has the potential to automate certain tasks and processes, leading to efficiency gains and new opportunities, it also poses risks of job displacement and the exacerbation of social inequalities. The consideration of AI as a cognizant being, capable of performing tasks traditionally associated with human intelligence, raises important questions about the future of work and the value attributed to different types of labor. It is therefore essential, to engage in a societal discussion about the implications of AI for the workforce and to explore strategies for mitigating the negative impacts while maximizing the positive contributions of AI to society.

The sociological engagement with AI, by offering insights into the social shaping of technology and the dynamics of hype, provides a valuable framework for understanding and navigating the complexities of AI's development and its societal implications. As we move forward, I would implore both those who view AI with rosy glasses and its detractor to maintain a critical and nuanced perspective on AI. For a responsible utilization of this novel technology it is necessary

to recognize its potential to drive societal change; while simultaneously being mindful of its limitations and the challenges it poses.

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