Big data Analytics

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This paper discusses the need for rigorous modelings of AI progress, addressing the lack of formal analysis and consensus on the nature, pace, and drivers of AI progress. It highlights the importance of well-developed models to support the development of plausible future scenarios, aid in long-term policy analysis, and robust decision-making. The paper contributes to this research program by suggesting ways to account for the relationship between hardware speed increases and algorithmic improvements, the role of human inputs, and the relationships between different sub-fields of AI, encompasses a wide spectrum of viewpoints on issues ranging from intelligence explosion to technological unemployment, AI progress rigorously, considering the interplay between hardware advancements, algorithmic enhancements, human inputs, and various sub-fields within AI.. It also outlines methods for tailoring AI progress models to generate insights on the specific issue of technological unemployment and proposes future research directions.

Contemporary discussions on AI highlight the strides made in research and anticipate further advancements. However, the characterisation of AI progress, its driving forces, and future trajectory lacks formal analysis, leading to substantial discrepancies in opinions. This paper aims to critique and refine implicit models of AI progress to facilitate informed policy decisions.
By leveraging established methodologies from other technological domains, it seeks to develop robust models for AI progress analysis.
While a comprehensive literature theorising AI progress is lacking, several relevant domains offer valuable insights. Evaluation literature presents diverse methods for assessing AI intelligence, while forecasting literature explores predictions of AI progress, albeit with a focus on human-level AI benchmarks. Additionally, AI risk literature delves into long-term risks associated with advanced AI systems, and natural intelligence literature provides parallels for understanding AI progress. Technological roadmapping literature offers insights into methodological approaches for modelling AI progress.

This section proposes avenues for advancing AI progress modelling by integrating insights from diverse literatures. It explores different levels and units of analysis, the relationship between hardware and software progress, the role of human inputs in AI performance, and the diversity of AI sub-fields. Emphasising the importance of context-specific analysis, it advocates for a nuanced understanding of AI progress and its implications for various domains.
Recent advancements in artificial intelligence have been closely tied to improvements in computer hardware, particularly in areas like deep learning. The exponential growth in computing power, coupled with the development of specialised technologies like graphics processing units, has significantly accelerated progress in various AI domains. However, understanding the intricate relationship between hardware and software progress is essential for modelings and extrapolating future AI advancements.

Rigorous modelings of AI progress is essential for understanding its complexities and implications. By addressing hardware-software interactions, human input, sub-field relationships, and economic impacts, researchers can develop more nuanced models to anticipate and guide AI advancements responsibly.