AI can take over key management roles in scientific research, shows study

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New research from ESMT Berlin shows how AI can manage human participants in large-scale research projects, taking over functions such as task allocation, coordination, and motivation.

Researchers Maximilian Koehler, Ph.D. candidate at ESMT, and Henry Sauermann, professor of strategy at ESMT, explore the role of AI, not as a "worker" performing specific research tasks such as data collection and analysis, but as a "manager" of human workers performing such tasks. Algorithmic management (AM) suggests a significant shift in the way research projects are conducted and can enable projects to operate at larger scale and efficiency.

With the complexity and scope of scientific research rapidly increasing, the study, published in *Research Policy*, illustrates that AI can not only replicate but also potentially surpass human managers by leveraging its instantaneous, comprehensive, and interactive capabilities.

Investigating algorithmic management in crowd and citizen science, Koehler and Sauermann discuss examples of how AI effectively performs five important managerial functions: task division and allocation, direction, coordination, motivation, and supporting learning.

The researchers investigated projects through online documents; by interviewing organizers, AI developers, and project participants; and by joining some projects as participants. This allowed the researchers to identify projects that use algorithmic management, to understand how AI performs management functions, and to explore when AM might be more effective.

The growing number of use cases suggests that the adoption of AM could be a critical factor in improving research productivity. "The capabilities of artificial intelligence have reached a point where AI can now significantly enhance the scope and efficiency of scientific research by managing complex, large-scale projects," states Koehler.

In a quantitative comparison with a broader sample of projects, the study also reveals that AM-enabled projects are often larger than projects that

do not use AM and are associated with platforms that provide access to shared AI tools. This suggests that AM may enable projects to scale but also requires technical infrastructures that stand-alone projects may find difficult to develop.

These patterns point towards changing sources of competitive advantage in research and may have important implications for research funders, digital research platforms, and larger research organizations such as universities or corporate R&D labs.

Although AI can take over important management functions, this does not mean that principal investigators or human managers will become obsolete. Sauermann notes, "If AI can take over some of the more algorithmic and mundane functions of management, human leaders could shift their attention to more strategic and social tasks such as identifying high-value research targets, raising funding, or building an effective organizational culture."

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