In this section, we feature reports from conferences, symposia, workshops, and similar events, focusing on discussions where the boundaries of HCI and UX are being challenged and where debate is lively and ongoing.

What Is Worth Knowing in a Digital and AI-Enabled World?

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There is a disquieting question in the air: What remains for us humans when AI can seemingly do everything important that humans do, only better? Which knowledge and competence is worth having?

Current technical progress in generative AI, as well as in other areas of computing technology, such as robotics, challenges us to discuss such questions. They're designed to provoke: One can argue that there is intrinsic value in knowledge. Humans always have the choice to do and learn whatever they want, independent of what AI can accomplish. Besides, before panicking, we might remember that it hasn't yet been established that AI is able, or will ever be able, to do everything important that humans can.

A more nuanced version of the initial question is: What do we humans have to know and be able to do in order to have a job in a digital and AI-enabled world? For HCI research and practice, this leads us to the design-oriented question: *Which knowledge and capabilities can modern AI complement and help build?*

Panelists at the 2025 ACM Mensch und Computer conference engaged in a lively debate moderated by Viktoria Pammer-Schindler, one of this article's coauthors. The participants represented the HCI field and application domains of modern AI. In this article, we share the substantial agreement that was developed and became apparent during the panel.

QUALIFIED PROFESSIONALS WILL BENEFIT FROM AI ASSISTANTS

Most humans are not good at or interested in highly repetitive tasks, whereas *AI has endless patience*. Repetitive tasks that can be done well by computational systems are good candidates for automation. Digital vocabulary learning apps and systems that train pronunciation illustrate this well: Repetition is necessary for humans to learn—both to train memory (vocabulary learning) and to train (fine) motor skills (pronunciation). The role of giving feedback, however, is needlessly repetitive for a fully trained teacher in the domain and could be taken over by an automated system, under the assumption that it can give correct feedback.

Even highly skilled professionals in production, medicine, or education cannot know everything in their domain. Computation based on methods from information retrieval and AI can help *find and provide complementary information*, which can then be evaluated for quality and appropriateness to the context by a qualified professional (e.g., finding the most recent evidence of the effectiveness of medication in specific medical cases).

In many environments, the *complexity of the problem and the size of the possible solution space are huge*. Therefore, computational methods are better suited for finding solution options, which then again need to be evaluated for quality and appropriateness by a qualified professional. An example environment is modern industrial production: Loading data from multiple sources, homogenizing data, and finding suitable parameter combinations are classical tasks for computational and AI-based approaches. In real-time monitoring this necessitates high-speed pattern recognition, constant awareness, and live synthesis of complex data. This is where the strengths of computational and AI-based systems come together.

Basic understanding of how AI works will (have to) become general knowledge.

Professionals also cannot be everywhere at once, while software is easy to duplicate. AI-based tools *can extend professionals' reach in environments where one-on-one human supervision is not possible or effective*. An example is teaching in a classroom with 20 or more students, some of whom may require special assistance. Language-based AI provides the potential to facilitate special reading assistance by providing simpler explanations or translations that surpass the capacity—and in the case of translations, capability—of a single teacher.

In all realistic visions, computational systems complement and assist qualified professionals, who are needed to attend to context and decide on action, taking AI's output into account but also contributing their own unique experience and expertise.

Challenges for HCI research and practice are to concretize salient characteristics of human activity and technological capability that indicate the appropriateness of automation, assistive technology, and technology as a tool, and consequently develop interaction design patterns for respectively different human-computer division of labor [1]. What are key design goals: productivity, learning, and competence, a pleasurable user

experience, task satisfaction or well-being [2,3]? How can these goals be considered for people with very diverse capabilities, backgrounds, and values?

AI LITERACY HELPS ASSESSMENT OF EFFECTIVE AND APPROPRIATE AI USAGE

Basic understanding of how AI works will (have to) become general knowledge. It's already happening. This process helps us understand which systems are useful in which ways in a task. Examples are understanding that contemporary large language model–based systems are quite good at explaining natural phenomena in simple words but nonetheless incapable of performing simple calculations. We might say this isn't surprising, since, for example, we're also not asking our calculators to explain how a rainbow works. The concept of AI literacy encompasses understanding the basics of how AI works, the capability to evaluate the suitability of AI for a given task, and the competence to envision possible uses of AI, and to assess potential longer-term consequences [4]. Such AI literacy will be required in many, if not most, professional domains.

In addition, AI literacy will need to become a much more ubiquitous kind of knowledge, if we consider that children from a very young age will increasingly observe AI in their environment, whether in the form of robot vacuum cleaners (not very intelligent), face-based authentication (using methods from AI), and voice-based assistants (arguably conforming to the prevalent understanding of what "an AI" is).

Key challenges in HCI design are for interactive technologies to clearly communicate what they are and their ways of thinking, in general and in concrete, in order to facilitate fundamental situated AI literacy, such as identifying an AI, its capabilities, and limitations [4].

KNOWLEDGE IS POWER

Domain knowledge will continue to be important, even with widely available AI-based tools. Those who are knowledgeable and can use these tools will be better off and more efficient than those who cannot. This is true at individual, organizational, and societal levels.



IMAGE BY IRA EVVA / SHUTTERSTOCK.COM

Returning to the above example of modern production, in which computational and AI-based methods assist professionals, a *key challenge for HCI design* is to provide user interfaces that allow professionals to focus on using their domain knowledge to understand, assess, and further process computational output. These interfaces should at the same time communicate relevant information about the underlying computational and AI-based methods, which will be necessary for professionals to understand the inherent limitations of a system's output. For instance, most industrial robots today are primarily designed for programmers, not for the frontline process experts in manufacturing. Creating "no-code" industrial robots is a way forward that will lead to the continued value of engineering domain knowledge.

"IT" IS A TOOL AND NOT HUMAN

It will be hard but important to maintain operative and continued awareness that AI is a tool and to not anthropomorphize "it," especially when it's made to look and feel human (e.g., chatbots) [5]. The difficulty is not so much about being rationally aware that an AI is a software program and fundamentally different in many ways from humans, but to be continuously, subconsciously, and emotionally aware of this difference and acting on it.

This will be an important *challenge for HCI and interface design* research and practice, as well as for all of us as users of technology.

LIMITS OF THE SHARED UNDERSTANDING

Both our discussion at the panel and its representation here are limited by time, word count, and our expertise. Two core limitations that we set in order to focus the discussion were, first, emphasizing overarching and realistic potential rather than focusing on risks and challenges. The realistic potential was grounded in the panelists' practical and research experience. Second, in many parts of the discussion, "AI" as a term stood in for different types of AI-based systems, such as generative AI, machine-learning based prediction, or even traditional computing.

Overall, while the panelists and authors are aware of AI risks and challenges, we hope that the discussion and its synthesis here help shape the emerging understanding of modern AI's potential and scope in relation to human experience and expertise.

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References

1. Simkute, A. et al. Ironies of generative AI: Understanding and mitigating productivity loss in human-AI interaction. *International Journal of Human–Computer Interaction 41*, 5 (2025), 2898–2919; https://bit.ly/4xvGKNr
2. Pammer-Schindler, V., Liut, M., and Ley, T. What if (everyday) technologies were designed for learning? Towards "support for learning" as a design goal for every(day) technology. *Proc. of the Extended Abstracts of the CHI Conference on Human Factors in Computing Systems.* ACM, 2025, Article 595, 1–7; https://bit.ly/4dGAtHJ
3. Ren, X., Silpasuwanchai, C., and Cahill, J. Human-engaged computing: The future of human–computer interaction. *CCF Transactions on Pervasive Computing and Interaction 1* (2019), 47–68; https://bit.ly/4cPxnku
4. Long, D. and Magerko, B. What is AI literacy? Competencies and design considerations. *Proc. of the 2020 CHI Conference on Human Factors in Computing Systems.* ACM, 2020, 1–16; https://bit.ly/4htrwUv
5. Seth, A. K. Conscious artificial intelligence and biological naturalism. *Behavioral and Brain Sciences.* Cambridge University Press, 2025, 1–42; https://bit.ly/4AewpIj

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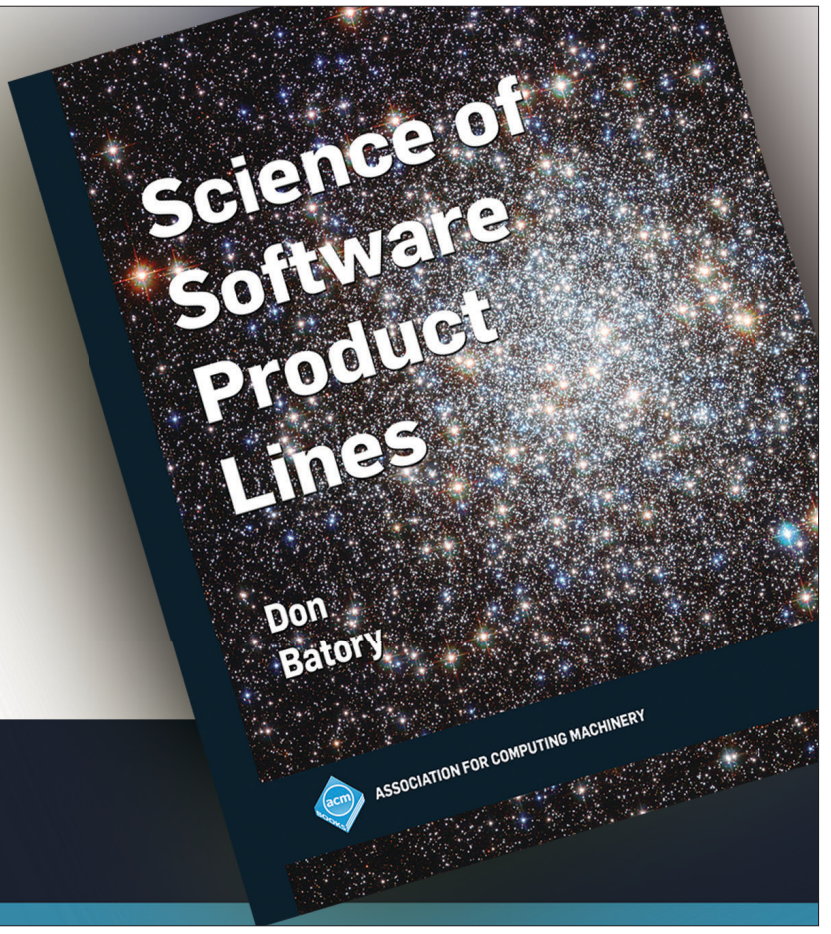
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