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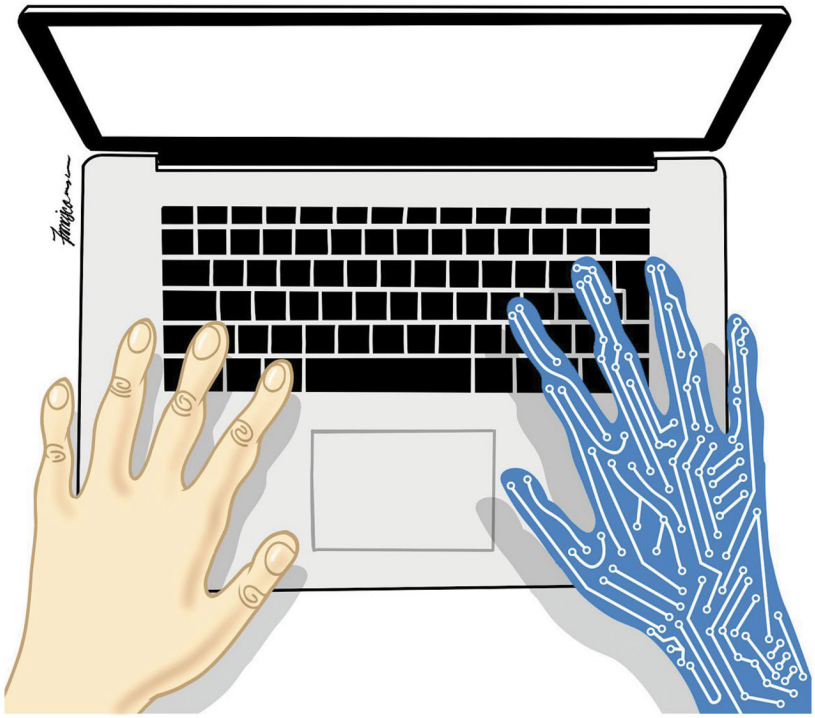

You think AI will render coding redundant? Not so fast

AI has its limitations while computer education is about a way of thinking that goes beyond code. We need to combine both for the best outcomes.

Jungpil Hahn

In a world where artificial intelligence (AI) has become central to our technological landscape, Nvidia's CEO Jensen Huang recently set the cat among the pigeons with a bold assertion. He said at the World Government Summit that it may no longer be necessary for people to learn programming or, more broadly, computer science, as AI could do the job.

Mr Huang's pronouncement has naturally stirred unease among students and parents who have invested heavily in coding education, viewing it as a crucial skillset for the future. But it also opens doors for us to discuss the evolving role of education in the age of artificial intelligence.

As someone who is an educator in the field, I accept that Mr Huang's statement carries a kernel of truth regarding the utility of AI in programming. But it oversimplifies the nature of computing education and underplays the limitations of AI.

At the heart of the controversy is the assertion that advancements in AI will enable individuals without formal training in programming or computer science to generate working programs. There is definitely merit to this argument.

AI's capabilities to understand and generate code based on user inputs are already quite impressive, and these capabilities have the potential to democratise access to programming by lowering barriers for domain specialists without formal programming training. This shift could potentially spur innovation and make it more accessible to a broader audience. However, this vision, while compelling, overlooks the intricacies of creating robust solutions to complex problems.

AI-generated programs are inherently limited by the scope of the prompts they receive from users and how specific these are. These tools may excel at addressing well-defined, narrow tasks but falter when faced with the necessity for broad, flexible thinking and anticipating multiple possible scenarios.

IT'S THE THINKING, NOT THE CODE

AI-generated programs may work flawlessly for the scenarios envisioned in the users' prompts but remain woefully inadequate for scenarios that have not been specified or anticipated. This gap underscores a fundamental misunderstanding of the essence of programming. It is not merely about generating code but about cultivating a deep, nuanced understanding of the complex problem space and the conceptual rigour required to navigate it.

Equating computing education solely with learning to write code overlooks the computing discipline's core value: computational thinking. Computational thinking extends far beyond the syntax of programming languages; it embodies a universal problem-solving methodology that is applicable across disciplines.

Computational thinking is about structuring and processing information and formulating solutions to complex problems in a systematic, logical manner. It involves breaking down complex problems into manageable parts, abstracting general principles from specific instances, and designing generalised algorithms to solve a wide array of problems.

This intellectual rigour in the approach to problem-solving is what computing education truly aims to instil. It is about training minds to systematically approach problems and devise generalised problem-solving strategies that are both effective and efficient. Such skills are invaluable, not only in the realm of technology but also in any field that requires innovation through critical thinking.

WHAT ABOUT EDUCATION?

Recognising the limitations of AI-generated programs and the broader applicability and value of computational thinking should make us rethink educational strategy in a way that embraces the complementary roles of AI and human intellectual capabilities.

In a world where technology increasingly intersects with every field of study, whether it be healthcare, finance, or the arts, the combination of computing skills with domain-specific knowledge becomes a powerful asset. An interdisciplinary approach, such as a double major or a significant commitment to both computing and a non-computing field, offers a promising path for students. Such a strategy will enable students to harness the problem-solving methodologies of computational thinking while deeply understanding the nuances of a specific domain.

A combination of computational capabilities and domain expertise will help us devise complete, robust solutions to complex problems. This approach makes graduates not only more versatile and adaptable but also better equipped to leverage AI tools effectively, using them as partners in the problem-solving process rather than as replacements for human intellect.

Mr Huang's comments may have been controversial, but they should kick-start a much-needed conversation about the future of education in an AI-enabled world. The advent of AI in programming does not mean that computing education will become obsolete; rather, it highlights the need for a curriculum that balances technical skills with the development of computational thinking capabilities.

It's important to note that the impact of AI on coding and programming roles is likely to be nuanced and varied. Entry-level coders and those primarily responsible for implementing well-defined, narrow tasks may find themselves more directly affected by AI's ability to generate functional code based on prompts. However, the limitations of AI-generated code become evident when it comes to more complex projects and these will continue to require human expertise in computational thinking and problem-solving.

As AI continues to reshape the professional landscape, the most successful individuals will be those who can seamlessly integrate computational thinking with domain-specific knowledge. Students who pursue an interdisciplinary path will find themselves equipped not just to adapt to the changes AI brings but to lead them. In doing so, they will prove that the value of education lies not in the rote learning of specific skills, but in cultivating a versatile, adaptive intellect that can navigate the complexities of a rapidly evolving world.

That is why we must seek to develop interdisciplinary programmes that promote computational thinking alongside deep subject matter expertise. We should design curricula to cultivate problem-solving skills, critical thinking and the ability to navigate complex challenges. Educators need to rope in industry partners to ensure that students get practical experience in leveraging AI tools.

By embracing the synergy between AI and human intellectual capabilities, we can unlock a future where innovation knows no bounds.

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