Future of Software Engineering (Short Summary)

Possibilities

AI can answer questions in professional, technical, and general fields. This can be in the form of an inline editor, such as GitHub Copilot. It can especially help developers write better, more usable code, potentially improving productivity by 2 to 3 times, according to media reports. AI is also very useful for identifying bugs, handling common errors, and finding good test cases. This is particularly helpful in languages that don't have garbage collection and are prone to pointer errors and memory leaks.
AI's vast knowledge of algorithms and data structures can assist in developing robust architectures and fast algorithms that translate well across various programming languages. It can also support learning in computer science, as developers are no longer required to memorize these concepts or research them as needed. This includes learning multiple frameworks or languages, which can be time-consuming and costly for the average developer.
By improving the productivity of developers, AI can help reduce costs in software products and even reduce salary expenses, as fewer people may be needed to complete projects. It can also aid in managing large software projects, where code styles can vary among developers—a challenge AI does not face. This does not include highly task-specific AI, which, for example, has already outperformed humans in image recognition tasks, such as classification.

Risks

There are also risks associated with AI-generated content and solutions. The statistical functionality of large language models (LLMs) is to predict the next word. LLMs also rely on a limited pool of training data, which can lead to the AI providing general answers to specific questions, especially when the user does not provide sufficient context. There is no clear path to finding new data sources that could alleviate this problem. Another potential issue is the risk of feedback loops in AI-generated content, which could further diminish the quality of AI responses. The more there is a push for fast implementation of AI, the higher the likelihood of errors slipping through and the quality of results being subpar. This highlights that there is a human component involved in the risks of using AI tools. Many users of AI do not fully understand how or why AI and LLMs work. The general use of AI without much thought about the underlying topics or the answers provided can quickly lead to a loss of critical thinking and learning ability. AI raises fundamental questions about human knowledge and learning, particularly about where it is necessary. There is a point at which certain knowledge is better attained through manual learning rather than being passively fed answers by AI.How humanity will address this issue in the future remains to be seen.
Furthermore, this approach to using AI can lead to mass misinformation if the AI relies on false information in its training data. Since the training data is not fact-checked by professionals, errors and misinformation can easily become part of AI models. Humans and even AI tools may struggle to reliably discern between genuine human-generated content and AI-generated content. In the context of the Turing Test, this could become a problem in the future. These concerns raise many philosophical, ethical, and societal issues that need to be addressed.