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Investigation of artificial intelligence techniques and their use in the software development process

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Abstract

In computer science, artificial intelligence or machine intelligence is the intelligence that comes from any machine (not man). Reference books in the field of artificial intelligence consider this science to be the knowledge of the study of intelligent agents, which is defined as: "Any device that has the ability to understand the environment and activity with the maximum chance of success." In general, the term artificial intelligence is used to describe machines or computers that perform well the cognitive activities associated with the human mind. Important cognitive activities include "learning" and "problem solving". Although Artificial Intelligence (AI) has become a buzzword for self-organizing IT applications, its relevance to software engineering has hardly been analyzed systematically. This study combines a systematic review of previous research in the field and five qualitative interviews with software developers who use or want to use AI tools in their daily work routines, to assess the status of development, future development potentials and equally the risks of AI application to software engineering. The study classifies the insights in the software development life cycle. The analysis results that major achievements and future potentials of AI are a) the automation of lengthy routine jobs in software development and testing using algorithms, e.g. for debugging and documentation, b) the structured analysis of big data pools to discover patterns and novel information clusters and c) the systematic evaluation of these data in neural networks. AI thus contributes to speed up development processes, realize development cost reductions and efficiency gains. AI to date depends on man-made structures and is mainly reproductive, but the automation of software engineering routines entails a major advantage: Human developers multiply their creative potential when using AI tools effectively.

Keywords: Software Engineering, Artificial Intelligence Techniques, Software Development Process.