



Special Focus on Software Automation*

From October 11th to October 13th 2018, forty researchers from the US, the UK, Canada, Australia, Japan, Singapore and China gathered at Yanqi-Lake to attend Yanqi-Lake Meeting 2018 to discuss software automation in the big data era. Software automation refers to the process of generating software automatically based on formal or informal specifications. Software automation (e.g., program synthesis, code completion, program transformation, code recommendation, program repair, and software self-evolution) used to be a dream in computer science, which can free developers from tedious programming. Following the theme of the Yanqi-Lake Meeting, we provide a special focus on software automation, which includes one review paper, one research paper, one perspective paper, and one letter.

The review paper, which is entitled “Evaluation of model checkers by verifying message passing programs”, is on automated software verification. This paper reports an empirical study on how different model checkers perform on verifying message passing software.

The research paper is entitled “A manual inspection of Defects4J bugs and its implications for automatic program repair”. This paper investigates the potential of automated software automation via a controlled study on how humans repair software.

The perspective paper is entitled “Automated program repair: a step towards software automation”. This paper focuses on a special form of software automation — automated software repair, and discusses the achievements and challenges in this form of software automation.

The letter, which is entitled “AI-boosted software automation: learning from human pair programmers”, is on interactive software automation that can be viewed as cooperation between machine programmers and human programmers. This article argues that interactive software automation may borrow ideas from cooperation in paired programming.

Overall, the four articles provide a showcase of current research on software automation, including progress, opinions, and outlooks. We hope that the four articles may stimulate further research in this important direction.

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