Reliable measurement and prediction of developer productivity in software development projects

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**Topic Description:** The measurement and prediction of the productivity (the amount of work performed in a unit of time) of software developers is an important management activity. However, due to various factors, it is very difficult to express this attribute reliably and consequently measure and predict it. Simpler approaches are based on lines of code, but in a more sophisticated approach the functional size of the software is considered (e.g. function points). The challenge is to tell the expected productivity of a developer in a specific context for a specific task. A related question is which technological solution to apply for a specific development task, which will provide the least required effort. These would serve the base for a reliable estimation of developer productivity and project progress monitoring.

The aim of the present research topic is to explore automatic productivity and effort estimation methods. We use machine learning methods to predict developer productivity based on a set of metrics derived from the software product and the process. The metrics used in the prediction as well as the productivity measure itself should be determined, with possible specialization to different contexts. We showed that the types of the changes (and not only their amount) have big impact on the productivity, so these factors (as weights) should be included in the prediction model. The task within the present research topic is to research on refined and more efficient prediction models, and their validation using realistic software projects.

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