

# AI Assisted Software Engineering

## Abstract

In the era of the AI enabled services, there is a question if AI will completely take over certain jobs such as software development, or will it be used as an assistance tool. Advocating for the latter outcome as more realistic, this work is dealing with a problem of how to use AI as an assistance tool to help reuse solutions for problems in software engineering, for which there already exist solutions. Existing libraries, such as GPT library are doing fairly well when generating code for specific use cases, and when their users use specific natural language requirements. However, these libraries are trying to solve problems of generating code for complete applications. The question that we try to solve with this work is, is it possible to use the existing libraries and train new models to adjust existing solutions of standard problems such as search problems, and generate the code for these, within a specific context, simply based on the natural language requirements of developers.

The main idea of this work is to establish a development approach that learns solutions to common problems in software engineering. The approach then needs to work by taking natural language requirements for a general problem that is already solved, and adjust the solution considering specific execution environment parameters, such as input and output data formats. Instead of focusing on generating code for applications, the idea is to have software engineers develop applications, but automatically reuse solutions that exist for various problems, instead of rewriting them in different contexts.

The main goal of this approach will be to achieve reusability of the already developed solutions. For many classical problems in software engineering, developers need to write code for every project, and even for different contexts in the project. The approach that this work proposes will reduce this effort and enable long craved for reusability in an automatic and intelligent way. Instead of focusing on writing solutions to individual problems, which exist in many cases, and adopting them to specific execution contexts, developers will be able to focus on developing applications with the ability to automatically reuse the well-tested, existing solutions. This will lead to effort reduction and reduce potential bugs in code.

In order to achieve this goal, it is necessary to do the following actions. It is first necessary to identify adequate AI libraries and models, which are able to generate source code based on natural language requirements. If there is not an adequate library, it will be necessary to train the model itself. Then, it will be necessary to create AI-based plugin that integrates with software development environments, takes requirements in natural language, and produces the source code for specific problems. Finally, it will be necessary to establish a development approach to demonstrate the benefits of code reusability considering AI an assistance tool.

**Keywords:** Artificial intelligence, code generation, software engineering, software development methodology.