Summary of “Using Pre-Trained Models to Boost Code Review Automation”

Title: Using Pre-Trained Models to Boost Code Review Automation

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Approach and Motivation

This research enhances code review automation by utilising a pre-trained Text-to-Text Transfer Transformer (T5) model. It addresses limitations of earlier approaches that relied on code abstraction, thus simplifying code review scenarios and limiting their applicability. By using a SentencePiece tokenizer, the new approach processes raw source code, thereby handling more complex review scenarios involving the introduction of new identifiers or literals. The study leverages a large dataset, combining source code with technical English from resources like Stack Overflow and CodeSearchNet, to train the T5 model in a more comprehensive code review context.

Aim and Novelty

The tool aims to automate code review tasks in more realistic scenarios than previously possible. It assists in implementing changes recommended during code reviews and in providing feedback to developers before the review. This novel approach is significant in its ability to handle diverse and challenging code transformations typically encountered in real-world code reviews. Notably, it can process changes involving new identifiers and literals, a substantial advancement over prior models.

Validation Method

The tool's efficacy was tested using a significantly larger and more challenging dataset than those used in previous studies. Its performance was compared with baseline models across different tasks such as recommending code changes and generating comments. The T5 model's superior performance was evident in its ability to make perfect predictions, as assessed through metrics like BLEU and CodeBLEU. Notably, the model demonstrated a strong correlation between the model's confidence level and the prediction quality, suggesting its potential for practical application in code review automation.