Cognitive Code Analyzer

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October 2021

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Chapter 1 Abstract

Source code is the building block of any form of software and maintaining efficiency and readability of source code is crucial for the long-term maintainability and usability of any software product. And it is the responsibility of software engineering teams to maintain consistent standards for their source code. The most common approach used by software teams to maintain source code readability and identify bugs is through source code review. Source code review is a process in which when an engineer finishes a project component, functionality, or module, before the developed functionality is released the source code changes in the newly developed functionality are reviewed by another software engineer who is typically more experienced. Although code review was proven to be an effective method for maintaining code consistency, one of the biggest problems in source code review is the amount of time spent by engineers to review code. Maintaining consistent efficiency of source code is an even tougher task because there is no single metric to measure the efficiency of source code. And even metrics like time complexity do not have an algorithmically straightforward method of evaluation from source code.

In this work we propose a “Hydranet” inspired deep learning based model architecture which can effectively learn the underlying patterns in the structure of source code code through it’s syntactic and semantic representations and use the learned representations to perform two primary downstream tasks : generating source code review and predicting time complexity.