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**Hybrid DefectPro: A CNN-RFC Approach for Software Defect
Prediction in Angular Projects**

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ABSTRACT

In recent years, the field of software development has seen a rapid increase in complexity, with more intricate software systems being developed to meet the demands of an increasingly digital world. The Angular framework is one such system that has gained significant popularity among developers due to its flexibility and scalability. However, as the complexity of these systems increases, so does the likelihood of encountering defects in the code.

The impact of software defects can be severe, ranging from system downtime and data loss to reputational damage and financial loss. As a result, detecting and mitigating software defects early in the development process is critical to ensuring the quality and reliability of the software product. Machine learning techniques have shown promise in identifying software defects before they cause significant problems. This project aims to implement a defect prediction system for Angular projects using a hybrid model that combines the strengths of Convolutional Neural Networks (CNN) and Random Forest Classifier (RFC) algorithms.

The CNN algorithm can effectively extract features from the source code, while the RFC algorithm can classify these features into either defective or non-defect classes. By combining these two algorithms, the system can leverage the strengths of both and improve the overall prediction accuracy. The proposed system will be evaluated on a dataset of Angular projects, with the performance of the system being measured against existing defect prediction approaches. The project will also seek to optimize the parameters and settings of the hybrid model, identify potential areas for improvement, and provide insights into the effectiveness of the hybrid model in identifying defects at an early stage of the development lifecycle.

The successful implementation of this software defect prediction system has the potential to significantly enhance the quality, reliability, and efficiency of software development. By identifying defects early in the development process, developers can take corrective action before they cause significant problems, resulting in a more robust and reliable software product.

Keywords: Machine Learning, Convolutional Neural Network (CNN), Random Forest Classifier (RFC), Hybrid, Angular