Republic of the Philippines
CAVITE STATE UNIVERSITY
Don Severino de las Alas Campus
Indang, Cavite

Developing an AI-Driven Code Debugging System for Efficient Software Development~~RESEARCH PROPOSAL TITLE~~

Rationale/ Introduction

Debugging is a critical yet time-consuming aspect of software development, often requiring developers to manually identify and fix errors in their code. Traditional debugging tools provide syntax and runtime error detection but lack advanced capabilities for understanding logical flaws and suggesting meaningful corrections. With the rise of Artificial Intelligence (AI) and Natural Language Processing (NLP), AI-driven debugging systems have the potential to revolutionize software development by automatically detecting, analyzing, and resolving errors with minimal human intervention. This research aims to develop an AI-powered code debugging system that enhances software development efficiency by identifying and correcting programming errors in real time.~~<Insert content; In-text citations are needed>~~

Significance of the Study

This study is significant as it explores AI's role in improving software development processes by reducing debugging time and enhancing code quality. By developing an AI-driven debugging system, this research will contribute to the automation of software error detection, benefiting developers, software engineers, and IT companies. Additionally, it will provide insights into how machine learning and NLP can be leveraged to improve software reliability, reduce debugging costs, and streamline software development workflows. The study will also address potential challenges such as false positives, AI model limitations, and computational overhead. ~~<Insert content>~~

Scope and Limitations of the Study

This study will focus on developing and evaluating an AI-driven debugging system capable of identifying syntax, runtime, and logical errors in Python and Java code. It will assess the system's effectiveness in reducing debugging time and improving code accuracy.

Formatted: Font: Bold
Formatted: Font: (Default) Arial, Bold

Commented [1]: Put your tentative thesis title here.
Remember:
A4 size, Arial 11
Academic Writing Style (good writing style should be considered)
APA formatting (referencing and in-text citation)
Always make sure that your proposal falls under any 3 prioritized CS research tracks
Avoid plagiarism
Always make sure that your proposed study is specific and attainable.

Formatted: Font: (Default) Arial, Bold
Formatted: Centered
Formatted: Justified
Formatted: Font: (Default) Arial

Commented [2]: Yung Rationale po ay nageexplain the reason behind your proposal - why do you propose that research idea.
First paragraph: Introduce ano yung problem or yung research gap. It is something that you want to address. Not because it is called problem ay direct problem na ito. It can be the gap, weaknesses, issues, or based on recommendations from existing literature.

Second paragraph: In few sentences, describe how you'll be able to solve the research gap or isolve ang weaknesses nito.

Third paragraph: Potential impact. Dito nyo na ihighlight yung expected outcomes or benefits nito.

Fourth paragraph: Conclusion. Just a summary of this rationale and conviction na maipush ang proposal nyo. This highlights yung value ng proposal nyo to contribute sa field ng CS.

NOTE: ACADEMIC WRITING STYLE should be followed. No to ChatGPT :)

Formatted: Justified, Indent: First line: 1.27 cm
Formatted: Font: (Default) Arial

Commented [3]: Itong section na ito ay nageexplain bakit yung study ay dapat at worth gawin, at kung bakit yung magiging findings mo dito ay mahalaga at makabuluhan. May magiging impact ba ito in the future? Pwede ba itong magamit sa iba't ibang field for them to develop their own technologies, etc.

Dito rin dapat ilagay yung "possible" contribution nito sa U.N. SDG. Basahin po muna ang https://www.un.org/sustainabledevelopment/sustainable-development-goals/ bago maglagay ng content. Wag magassume dahil may focus ang bawat goal.

Dito rin ilagay po ang involvement ng proposal nyo sa CvSU Thematic Area. If one or more involved areas, okay lang po basta maijujustify nyo po sa section na ito.

Formatted: Font: (Default) Arial

However, the study will not cover AI's role in other software engineering tasks, such as automated testing or software design, nor will it analyze debugging in low-level programming languages like Assembly or C.

Objectives of the Study

This study aims to design and develop an AI-driven code debugging system that improves software development efficiency. By evaluating its accuracy, effectiveness, and usability, the research seeks to enhance debugging automation in programming. Specifically, it will:

1. Develop an AI-powered debugging system that identifies and suggests corrections for programming errors.
2. Evaluate the accuracy and efficiency of the AI-driven debugging system compared to traditional debugging tools.
3. Identify challenges and potential improvements for integrating AI debugging tools into real-world software development environments.

Expected Outputs

Expected Outputs

The research is expected to produce a functional AI-driven debugging system capable of detecting and correcting programming errors. It will provide an analysis of the system's effectiveness in improving software development efficiency and offer recommendations for optimizing AI-driven debugging techniques. Additionally, the study will explore challenges such as AI interpretability, debugging accuracy, and integration into modern Integrated Development Environments (IDEs).

Commented [5]: Imagine na yung inyong proposal po ay nagmamaterialize na. You need to identify ano yung mga features, sub-routines, or functions na maicocover po ng inyong study. If experiments, describe how the experiments will worl then ano yung possible or expected output from it.

Description of outputs (specifications, datasets, algorithms, prototypes, etc.)
Description of materials to use

Formatted: Justified, Indent: First line: 1.27 cm

References

Chen, J., & Zhou, Y. (2020). *AI-driven software debugging: Challenges and future directions*. *Journal of Software Engineering Research and Development, 8*(2), 55-71.

Gupta, D., & Kumar, R. (2021). *Automated debugging with machine learning: A review of AI-based error detection techniques. ACM Transactions on Software Engineering and Methodology, 30*(1), 1-23.

Li, X., Wang, Q., & Zhang, Y. (2019). *Using deep learning for software fault localization: A survey. IEEE Transactions on Software Engineering, 45*(6), 1128-1150.

Commented [6]: Use legit materials po. Use APA formatting