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Coding Companion Using Artificial Intelligence

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ABSTRACT: Coding Companion is an AI-powered web application that leverages the Machine Learning language model to assist developers with their coding tasks. The application allows users to input code snippets or describe their coding problems in natural language, and language model generates relevant suggestions and solutions in real-time. By utilizing Tesseract.js, Coding Companion can provide a more seamless and user-friendly experience for developers. Instead of manually typing in their code, users can simply upload an image, making the process faster and more efficient.

KEYWORDS: Interface, Interactive, Natural language processing, Code engine, Debugging, Code generation, Real-time, AI Model

I. INTRODUCTION

Modern computing has changed how people communicate and learn. The transmission of news, messages, and ideas is instant. Anyone's voice can be heard, and thoughts can be shared and learned, with a visual feed. In fact, access to digital learning technologies such as the Internet is so fundamental to daily life that their disruption is only going to lead to significant economic and social disruptions. Digital learning has become increasingly important over the past few years, especially considering the COVID-19 pandemic. With schools and universities closed, students and educators have had to rely on digital tools and online learning platforms to continue with their education. But while the technology to distribute our ideas has grown in leaps and bounds, the terminals have remained largely the same. So here, an advanced interface, a web application for software developers and learners who need a one-stop solution for all their coding problems has been proposed. Beginners who step into the world of coding need a computer, coding software or tools, learning resources, patience, a supportive community, and a friendly user interface to make the process of learning interactive and interesting. The existing systems still have a few stumbling blocks like usage of long-established techniques of search, and yet giving only the related website links and the user is required to skim and consume the needed information.

II. RELATED WORK

The concept of online virtual assistants for helping with coding was previously explored by [1] TabNine was developed by a startup company called Codota, which was founded in 2015 by Dror Weiss and Eran Yahav. Codota's goal is to make programming more efficient and enjoyable by using artificial intelligence to provide code suggestions and analysis. [2] CodeBERT was developed by a team of researchers from Microsoft Research Asia, Peking University, and Huawei Noah's Ark Lab, CodeBERT was trained on a large corpus of code and natural language data, allowing it to generate code from natural language descriptions

[3] Kite was developed by a team of software developers and data scientists from Kite.com. The team included Adam Smith, Ian Webster, and Vadim Markovtsev. The purpose of Kite is to provide an AI-powered autocomplete plugin for Python and JavaScript code editors. [4] IntelliCode was developed by Microsoft as a feature of Visual Studio. The team behind IntelliCode included software developers and machine learning experts. IntelliCode uses machine learning models to provide intelligent suggestions for code completions, refactorings, and other improvements to code

III. METHODOLOGY

Collect a large amount of programming code and natural language data. The code can be sourced from open-source projects, while the natural language data can be collected from various sources such as forums, blogs, and documentation. The collected data would need to be pre-processed before it can be used for training the machine learning models. Once the data has been pre-processed, the next step is to train the machine learning models. This would involve using algorithms such as deep neural networks to train the models to recognize patterns in the data and make predictions.

After the coding companion has been developed, it would need to be tested and evaluated to ensure that it is accurate and efficient.

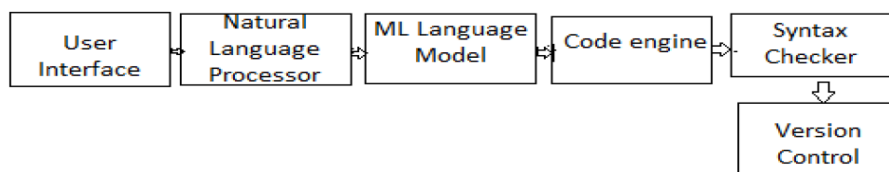


Fig 1.1 Block Diagram

IV. EXPERIMENTAL RESULTS

Here are some of the experimental results of Coding companion. Here, the user has asked for a code snippet in their required language and the coding companion has provided an error free program as requested.(as shown in Fig 2.1 Simple command). Here the coding companion acts a code converter, between the languages of C and Java. The code snippet is given as input and output is the converted code in another language. This is possible with many other programming languages. (as shown in Fig 2.2 Code Conversion)

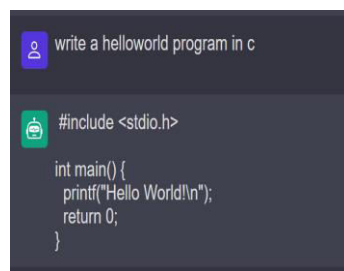


Fig 2.1 Creating simple codesnippet

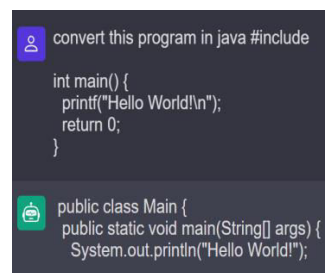


Fig 2.2 Code conversion



Fig 2.3 Image-to-Text conversion

The Image-to-Text conversion option makes coding companion even more exciting and versatile. The user can upload a picture of code snippet of any language and its textual form will be available in the click of a button. The interface can also be used for debugging the same.

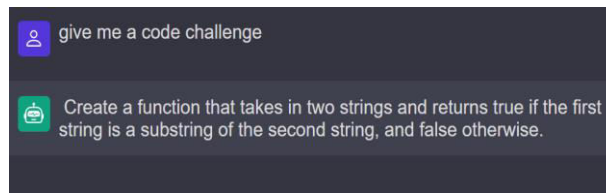


Fig 2.4 Questionnaire

The Coding companion is capable of providing the user with hackathon kind of coding questions to solve as exercises and practice. The answers for the same will be provided so that the user can verify their work

```

debug <5tdin.h>
hellowor1d( n)(
printf("Hello world 2 'd\n", n);
)
main() (
n : n
while(n<fi) (
hellnwor1d(n);
n++; )
0}
)
    
```

Fig 2.5 Code with error

```

#include <stdio.h>

void helloworld(int n) {
printf("Hello world %d\n", n);
}

int main() {
int n = 0;

while (n < 5) {
helloworld(n);
n++;
}

return 0;
}
    
```

Fig 2.6 Debugged Code

Coding companion one of the very few web interfaces that provide one of the most sought after functionalities – Debugging. The user can type in a code in the chat section and the application returns the error-free code, with proper indentation in seconds.

V. CONCLUSION

Coding companion one of the very few web interfaces that provide one of the most sought after functionalities – Debugging. The user can type in a code in the chat section and the application returns the error-free code, with proper indentation in seconds.

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