Cassy Prescott

A03

Computer Vision for Artificial Intelligence 15698

Professor Anna Devarakonda

Saturday, February 8, 2025

A03 Understanding of Module 3

Introduction

This research paper focuses on the information I gained while reading module three of my Computer Vision for Artificial Intelligence class, including libraries, frameworks, various integrated development environments, code repositories, and collaboration platforms. The purpose of this reflection will be to discuss computer vision techniques of trade and why tech advancement will make life easier.

Topic

I read the Tools of the Trade presentation slide to understand the assignment:

1. I read the Tools of the Trade presentation slide to understand the assignment: Libraries and frameworks are essential to developers building efficient computer vision software.
    - Computer vision **libraries** consist of pre-written code that AI developers can use to make tasks more efficient.
    - **Frameworks** are more comprehensive in that they provide a collection of pre-built tools and libraries to accelerate development, improve accuracy, enhance collaboration, and ensure scalability.

1. Integrated Development Environments are software applications that provide tools for developers to write, test, and debug code for computer vision programs. Computer Vision IDEs include:
    - Jupyter Labs
    - Visual Studio Code (VS Code)
    - Google Colab
    - AWS SageMaker Studio Lab
    - Azure Copilot
2. A code repository is a location for developers to store and manage computer vision code and resources. **GitHub** is commonly used for code storage by many developers**. GitHub Copilot** assists developers in writing computer vision code by suggesting code.
3. Computer Vision Resources:
    - Texas Advanced Computing Center (TACC) has high-grade computing resources for large-scale computation. This includes large storage systems, advanced data analysis tools, and access to powerful infrastructure.

- Hugging Face provides cutting-edge computer vision tools to assist developers create and train custom models for image recognition, object detection, and semantic segmentation. This platform can be integrated with other tools such as TensorFlow and Pytorch.

4. AI code assistants increase productivity, reduce errors, improve learning, and enhance collaboration. Common AI assistants include:
    - Google Gemini Code – an AI driven code assistant integrated with Google Colab.
    - GitHub Copilot – An AI code completion tool developed by OpenAI and GitHub.
    - ChatGPT 4.0 – Generative AI code assistant outside of an IDE developed by OpenAI.
    - Amazon CodeWhisperer – This AI powered code assistant helps write code faster and with few mistakes by making suggestions. It integrates seamlessly with Amazon SageMaker Studio Lab and other popular IDEs.
    - Claude
    - Devin

Personal Reflection

I delved into the essential tools and techniques necessary for implementing computer vision projects. The information presented during this learning experience was not only insightful but also straightforward, making complex concepts easier to grasp. Through this process, I gained a deeper understanding of various computer vision libraries, frameworks, and integrated development environments (IDEs) that are widely used in the field today.

Although I have primarily utilized Visual Studio Code to develop my software portfolio, I had not previously explored the range of other IDEs available in the market. This has opened my eyes to new possibilities and tools that could enhance my development experience. I now recognize the importance of familiarizing myself with different environments to find the best fit for my specific projects and preferences. Overall, this experience has greatly enriched my knowledge and skills in computer vision.

Discussion on Improvement and Learning

I received this information with a great deal of excitement and genuine interest. My curiosity around AI libraries and frameworks has grown significantly, as I believe mastering them will be key to securing a job after graduation. With that goal in mind, I'm eager to explore these tools further and deepen my understanding of their applications. By the end of this semester, I hope to start working on my own computer vision projects, using the knowledge gained from this reading to explore and experiment with the other essential tools in the field. I'm excited to dive deeper into the resources and grow my skills, setting a strong foundation for my future career.

As I familiarize myself with these tools and concepts, I will find that computer vision becomes much more accessible for future projects and endeavors. This understanding will empower me to leverage the potential of computer vision technologies effectively in my work.

Conclusion

The various programs, libraries, and frameworks highlight major advancements in computer vision tools. After completing the reading, there should be an understanding of libraries, frameworks, various integrated

development environments, code repositories, and collaboration platforms. Understanding these applications will enhance one’s developing skills, making computer vision more accessible.

A solid grasp of these applications is crucial, as it will enhance my development skills and knowledge.

References

Devarakonda, Anna. "Computer Vision Libraries, Frameworks, and IDEs: Exploring Tools for Vision Development." n.d. 8 February 2025.