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Customer Background

Purdue Polytechnic Institute, the project's sponsor, provides the Capstone Lab as a platform to develop and test ChatGPT-based AI tools, enhancing knowledge retention and training with advanced 3D printing technologies

Problem Statement

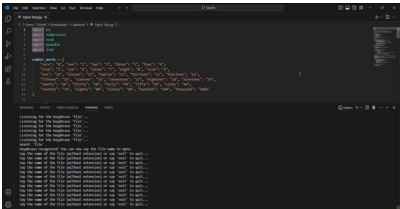
The project addresses a crucial challenge of retaining and passing on essential technical knowledge as experienced employees approach retirement or exit the company. The AI model will assist users in navigating technical processes and enhancing their understanding of the processes.

Requirements

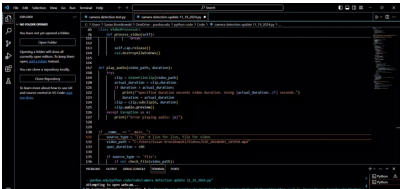
Requirements	Metric
Knowledge Repository	Vuzix Blade
User Friendly	Existing Technology
Large Language Model	WMatrix
Learning Assistant	AI - Chatbot
Cost	~\$2000

The project requirements focused on building an efficient knowledge retention system. Key components included Vuzix Blade smart glasses, WMatrix for data processing, and an AI chatbot for real-time support, all within a \$2000 budget. These elements ensured technical and cost-effective solutions.

Experimentation and Concepts



Voice Recognition Code



Object Recognition Code

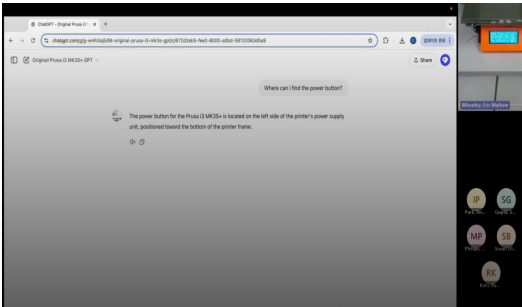


The Vuzix Blade Glasses are augmented reality smart glasses that enhance learning by displaying information in the user's view. In this project, the glasses recorded training videos, provided real-time guidance, and supported knowledge retention for 3D printer operations. Integrated with ChatGPT, they enabled users to follow instructions, troubleshoot, and receive support.

Final Design

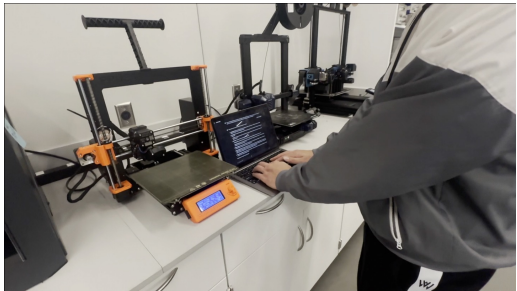
The final design integrates Vuzix Blade smart glasses, an AI-powered chatbot, and WMatrix to create an efficient knowledge retention system. The glasses enable hands-free learning and real-time guidance, while the chatbot provides tailored support and troubleshooting.

WMatrix processes complex data into user-friendly insights, ensuring accessibility for all users. This system is designed to streamline training processes, reduce knowledge gaps, and improve operational efficiency.



Word	Frequency	Relative Frequency	Concordance
obj	128	5.60	Concordance
endobj	127	5.56	Concordance
/outgstate	55	2.41	Concordance
/mediabox[55	2.41	Concordance
/contents	55	2.41	Concordance
/r/group	55	2.41	Concordance
/tabs/s/structparents	55	2.41	Concordance
/font	52	2.28	Concordance
_o_612_792	51	2.23	Concordance
/t	49	2.14	Concordance
4/dest[49	2.14	Concordance
/r/xyz	49	2.14	Concordance
/structparent	49	2.14	Concordance
r	47	2.06	Concordance
stream	10	0.44	Concordance
j	10	0.44	Concordance
0	9	0.39	Concordance
ez+gn	9	0.39	Concordance
=a	9	0.39	Concordance
x	8	0.35	Concordance
87_0	8	0.35	Concordance
p	7	0.31	Concordance
/	7	0.31	Concordance
a	7	0.31	Concordance
38_0	7	0.31	Concordance

Testing



Prototype testing was conducted using our AI-trained model for the Prusa i3 3D printer to evaluate its effectiveness in guiding users and troubleshooting. The Vuzix Blade 2 was also tested, but its limited battery life prevented full testing. Despite these challenges, the AI model was successfully tested on desktop devices.

Feedback:

Users suggested improvements to make the responses more focused and directly aligned with their specific inquiries.

Result:

The AI models were refined to deliver concise, context-specific responses, ensuring they align closely with user needs.

