EYE(i) ROBOT

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ABSTRACT

Today, smart home assistants such as Google Home and Amazon Alexa are not anything new. While undoubtedly such inventions have the potential to reduce daily burden and improve productivity of its users, one important aspect remains lacking – reliability. The unreliability and uncertainty that comes from smart home assistants is exactly why many tend to avoid them. Thus, we created EYE(i) ROBOT.

Under the hood, everything is embedded into a Raspberry Pi 4B making home automation microservices possible. The program itself is built with Mojo, a new OOP-language designed to accelerate parallelization - reducing latency when executing a task. The program takes two inputs, audio and video. The audio input will be used to take voice commands using Speech-To-Text. Then, the command is processed using a Large Language Model (LLM). Integration of an LLM greatly enhance our robot answering capabilities to any questions users may have throughout their day-to-day basis. As for the video input, we use OpenCV to recognize faces in captured input. However, to adjust the eyeball's gaze accordingly, the program will map X-Y coordinates of detected-face from the video input into corresponding X-Y servos attached to the eyeball.

With that, we present EYE(i) ROBOT, a one-eyed mini robot companion with its sole purpose to be the most reliable home assistant. To elaborate, our robot can assist users with various questions with utmost accuracy. Meanwhile, its eye can track users providing a more human-like interaction experience. For security purposes, users can monitor their homes through EYE(i) ROBOT's vision via our app. Not only that, but our robot can also automate homes just like any other home assistants available in the market.

Beyond the state-of-art capabilities of EYE(i) ROBOT, we should note that there are limitations to the use of LLM. There is a continue need for ongoing research on "hallucinations" generated by LLMs to ensure that outputs are more reliable and verifiable.

Keywords: Raspberry, Mojo, AI, Robot, LLM

Abstract must be written in English in less than 300 words. The abstract must summarise the main aspects of the project. Abstract should also contain a brief description of the project which includes (i) problem statement(s) or objective(s), (ii) innovation development, (iii) commercial potential, and (iv) brief conclusion.