

JARVIS

Group 11

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Problem Statement

While solutions exist today for voice based interaction with mobile devices, there is currently nothing on the market that features passive listening, human-like interaction with the user's smartphone. Our project JARVIS aims to provide a mobile, easy-to-access, voice-controlled assistant that equips users with navigation directions, music, digital communication, and reminders of appointments or other daily tasks without interrupting their daily workflow by requiring interaction with their smartphone.

Background Information

Similar Platforms

Existing virtual voice assistants like Amazon's Alexa, Apple's Siri, and Microsoft's Cortana are powerful but they each have their limitations to convenience. In particular, Alexa is rather unwieldy and is usually plugged in; Siri requires the user to have the phone in front of them; and Cortana has had accuracy issues as well as privacy concerns.

Solutions to limitations

JARVIS overcomes the aforementioned shortcomings because it is portable, passively listening, and a standalone system. It works by integrating existing pieces of technology; the audio input and output are enabled by earphones with an in-line microphone, the power can be supplied using a portable battery pack, and the processing will be efficiently handled by a (compact) Raspberry Pi. Creating a personal assistant using these well-established technologies has the added benefit of providing users with many options to customize and upgrade the hardware that interacts with the Raspberry Pi. We can create a more secure way of storing personal information. With these components combined, whenever the user wants to use the system, he or she only need to speak the command and JARVIS will handle the rest.

Audience

Individuals who will likely find the most use from JARVIS would be those who frequently interact with their smartphones for simple tasks. Examples of this are people who frequently need to: travel between places, frequently exchange text messages, and use their phone to stay on schedule.

Requirements

Functional

1. As a developer, I would like to know whether someone is walking, biking, or in a car using GPS or accelerometer data.
2. As a developer, I would like to store online usernames and passwords securely.
3. As a developer, I would like to get the GPS location of JARVIS at any given point in time.

4. As a user, I would like to know someone's name given a picture of their face.
5. As a developer, I would like to take photos with JARVIS and save to disk or export to social media.
6. As a user, I would like to know the quickest route to get to somewhere.
7. As a user, I would like to know the weather and how I should prepare.
8. As a user, I would like to play music from a locally-stored library.
9. As a user, I would like to stream music from Spotify or other streaming services.
10. As a user I would like to choose between multiple different music streaming platforms.
11. As a user, I need JARVIS to notify me when I lose a GPS or Wi-Fi signal so I can adjust to my loss of connection.
12. As a developer, I would like to use artificial intelligence to predict user habits and time commitments (e.g., class and work).
13. As a user, I would like JARVIS to (optionally) have a sense of humor (if time allows)
14. As a developer, I would like to be able to query Google for answers to user questions.
15. As a developer, I would like to be able to provide the user with social media updates.
16. As a user, I would like to be able to use JARVIS with most speaker systems.
17. As a developer, I would like JARVIS to use voice recognition to process commands.
18. As a user, I would like to be able to control the device without reaching into my pocket or bag.
19. As a user, I would like to know if I am running late to an appointment.
20. As a developer, I would like to service the user with as much as possible without an internet connection.
21. As a user, I would like JARVIS to be largely unnoticeable to others.
22. As a user, I would like JARVIS to give me statistics about my day (e.g. walking distance, frequented spots).
23. As a developer I would like to use the statistics gathered in (22) to predict user behavior. (If time allows)
24. As a user, I would like JARVIS to understand a wide range of command structures.
25. As a user, I would like to be able to silence JARVIS whenever I want to.
26. As a user, I would like to resume JARVIS whenever I want to from a silent state.
27. As a developer, I would like to know if a user is wearing JARVIS earbuds using ultrasonic frequencies (if time allows).
28. As a user, I would like to only have to charge JARVIS once a day.

Non-functional

1. We must be able to run the Raspberry Pi for at least 5 hours without recharging.
2. JARVIS must be able to interface with Google Calendar to determine a user's schedule.
3. We must use a sufficient encryption scheme to protect cached social media, email and online passwords to ensure user privacy.
4. We must be able to connect to the internet using mobile data.
5. We must be able to provide notifications with a frequency and in a way that doesn't annoy users.
6. JARVIS must be comfortable for the user to wear.
7. We must be able to query Mycroft's STT API as quickly as possible.

8. We must allow time for the computations and image upload that takes place when using the facebook facial recognition algorithm. To do so would require informing the user of an estimated time to complete.