

SMART ASSISTANT HUMANOID ROBOT FOR SMART HOME ENVIRONMENT

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ABSTRACT

This paper includes the usage of an open-source reply for develop a totally free Smart Assistant Robot gave to managing a splendid home for more seasoned people. The structure is worked around a voice correspondence module considering « Mycroft AI » to talk with sensors and sagacious contraptions. It consolidates various item applications made to see faces, set up tasks, and answer express requests and sales. An embedded structure is used as a close by server to manage the splendid home and its couple of utilizations. The results present many kinds of exercises that the robot can perform to address the client's inquiries. The embraced exercises can be vocal reactions, mechanical moves and developments, programming endeavors or basically in kind of a text.

INTRODUCTION

The MQTT show has been communicated as "the show" for the Internet of Things by the open rules body, OASIS and a critical development association, IBM. It has been advanced as the lower power choice rather than HTTP and other IoT shows (Constrained Application Protocol - CoAP, Advanced Messaging Queueing Protocol - AMQP, etc), yet the very manner by which low-power is it? With a wide show of limits to move, how does MQTT act in regards to drive use, to meet different test conditions? This hypothesis expects to answer a piece of those requests. Envisioned in 1999, this show was not wanted to be the show for what we know today as the Internet of Things. It was intended to make a show that gave immaterial battery mishap and involved insignificant information move limit with respect to communicating oil pipelines over a satellite affiliation. Its goals were to be an easy to complete show that gave Quality of Service Data Delivery and to be bandwidth successful and data freethinker while staying aware of constant "meeting care" 1. It also should be lightweight and easy to do. While these stay the targets of the show, its application isn't limited to interacting oil pipelines any longer, and by and by, it is a critical driving show of IoT organizations and devices. Preceding looking at the show start to finish, it implies a lot to put it into setting and look at the end-all strategy of IoT, its transcendence, importance and impact on our current reality and later on, to understand the justification for why the shows that drive it ought to be examined with carefulness. The evidently sudden ascent of IoT has been various years truly coming to fruition, as new advancements emerged and conditions become better for further developed accessibility. The overall advancement mix, Cisco, points out the support behind the improvement of IoT progressions minimalistic ally. Since the cost and size of far off radios has generally dropped and IPv6 expanded the amount of devices that could be consigned an overall correspondence address, more contraptions began to be

conveyed with inbuilt Wi-Fi and cell remote organization. With improvements being made to battery development, contraptions are in like manner ending up being more power-useful and region pragmatist. Assumptions regarding the improvement of IoT are adequate, with basically every inventive beast bouncing onto the prevailing fashion to not miss the monstrous potential. Cisco's Internet of Things Group (IOTG) predicts that there will be more than 50 billion related devices by 2020. The American assessment and cautioning firm, Gartner, Inc. gauges that 8.4 billion related things will be involved generally speaking in 2017, up 31 percent from 2016, and will reach 20.4 billion by 2020. Hard and fast spending on endpoints and organizations associated with IoT will reach almost \$2 trillion of each 2017. With the business creating at a fast speed, there is a basic prerequisite for risk assessments and an accentuation on the security and execution of IoT contraptions. The focus in cutting edge security projects is pushing toward area and response. The rising unpredictability of the environment requires a mind boggling method for managing dealing with the security and execution of both individual contraptions as well as the structure with everything taken into account. 3 It is then fundamental to isolate IoT into its layers, to get a handle on the security and execution essentials in all of them.

PROPOSEDSYSTEM

he proposed game plan in this paper, is a singular right hand presented as a humanoid robot equipped with an embedded instinct stage as well as an organized vision structure. It has been arranged then developed to coordinate discussions, talk with individuals and splendid contraptions through voice orders, see, find and count people's appearances. The general plan of the structure is addressed by figure 1. The camera and sound devices are set for correspondence and correspondence with the clients. It can convey information even more clearly. It is more versatile than

verbal correspondence. They are more attractive and securing.

The rest of the paper is organized as follows. In section 3, we review the related work which deals and the application security. We present the proposed system in section 3. We test the proposed system method in section 4. We analysis the system result in section 5. We conclude the paper in section 6.

RELATED WORK

Jevgenijus Toldinas, Borisas Lozinskis, IoT today envisioned for making, modifying and sharing information and data. A couple of sources expect the amount of tens and hundreds billion related contraptions for the year 2020-2025. One of the most notable standard machine-to-machine application layer shows to interconnect the things and applications to the Internet of Things is Message Queuing Telemetry Transport show. Nature of organization (QoS) oversee network execution parts like inaction, bungle rate and uptime. MQTT gives three levels of QoS. Use time of IoT devices is constrained by its most essential resource - battery. This paper deals with the appraisal of energy use in moving data using lightweight MQTT show over it different QoS levels. For tests, we executed client-server plan and use MQTT disseminate/purchase in show to move data between center points.

Tom Wilson. It's been just about a long time since Eric Schmitt, Google's past CEO, extensively remarked, "If you have something that you don't keep up with that anyone ought to know, maybe you should not be doing it anyway." Despite such absence of worry toward purchaser insurance by colossal tech associations, it's taken shames including shared private data, assigned advancing, and connected control with choices for standard clients of free web or versatile applications to comprehend that their data are not persistently being managed due respect and security. Fixed the fundamental size as one. Some unique choice based on what's by and large expected letters ordinarily together report is checked tolerating the letters normally together record is even, increment the worth by one else letter set overview is odd rot the worth by one. Encryption of scrambling the letters in the code text.

Prakhar Srivastava; Mohit Bajaj. In this paper, makers have focused in on controlling of combination energy structure using IOT. There is different mix of energy and all of them are choice as opposed to each other like sun situated energy, wind energy, bio fuel, power module, etc. In any case, the need of controlling of cross variety energy system arises when it is presented for local or business reason. At this moment IOT expects a critical part in controlling structure. The essential models being trading between the two wellsprings of energy for instance sun situated and wind energy with basically no weight through a site using

ESP8266 Wi-Fi module. The data is sent somewhat through site to ESP8266 module which controls the wellsprings of energy. The conveyed data is controlled remotely using IOT. This engages client to have versatile control framework to some degree through a got web affiliation. This structure helps the client with controlling the wellsprings of energy, actually and remotely using PDA or PC. This structure is very capable, more affordable and versatile in movement.

D. Zhang, S. Lin, Y. Fu and S. Huang. To grasp the correspondence between the Web applications and the introduced systems, and to chip away at the capability of PC program and embedded structure correspondence, this paper progresses a response of building the hyper-text move show (HTTP) web server got together with transmission control show or client datagram show (TCP/UDP) connection program using Node.JS stage. This paper in like manner presents the system for building the web server on the Express edge work assisted the MongoDB data base. The correspondence progress and show between have PCs and the embedded structure are outlined as well.

R. A. Atmoko and D. Yang. Today there are various huge changes on the Industrial organization structure that we called Industry 4.0. The latest disturbance of the development completed in industry. As we presumably know strangely, we are using a steam engine to running current stuff, and a short time later we are including power which has made a colossal upset in the cutting-edge movement. Nowadays, the presence of the web advancement will make one more face of the cutting-edge organization, especially on the controlling and actually looking at action. This paper will inspiration driving the execution of web advancement for screen and control current arm robot in industry. Base on this paper is execution MQTT as the latest show on the Internet of Things applications. We make a web-based association point for really taking a look at development and controlling the mark of joint arm robot in a ROS Industrial reenactment environment. Correspondence between current arm robot proliferation and client using MQTT show give low dormancy data transmission. The typical of latency time transmission among client and robot is 0.3196 second.

**METHODOLOGIES
SYSTEM ARCHITECTURE**

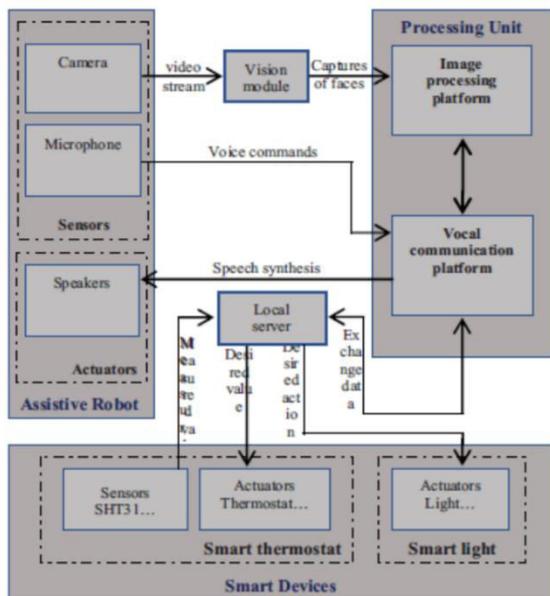


Fig. 1: Global System Architecture

The vocal communication platform is based on the natural language processing. Our personal voice assistant was developed around « Mycroft AI » open platform to communicate and respond to the user’s requests as well as to remotely control and order smart home equipment. MQTT (Message Queuing Telemetry Transport) communication protocol was selected for establishing communication between the connected devices such as managing the smart lighting, heating and cooling systems. A local server was as well conceived in order to operate as a gateway. It performs several critical functions ensuring the robot connectivity, data management, and cloud storage.

PROPOSED MODULES AND ALGORITHM

LIST OF MODULES:

- Streaming
- Vision module
- Local Server
- Vocal Communication
- Image Processing

Streaming: To address an unblemished and precise picture, the client should face agreed with the webcam position as tended to in Fig. 1. The image of the individual is gotten by webcam. Dlib has a pre-arranged dataset iBUG 300-W which has 68 bearings that intended to the embodiment of a person. The facial identifier perceives significant achievements on the substance of an individual and tracks them

Vision Module: For eye ID, we use Eye-Aspect-Ratio (EAR). It was used to see if the singular's eye is flickering or not in the video frame. Each Eye is imparted as 6 created (p1-p6), p1 is the course of the left piece of the eye and subsequently p2-p6 is found fittingly when we travel in the clockwise heading.

Local Server: The local server is the crucial part to manage data and assurance correspondence between the taking care of unit and the different astute equipment. To achieve this goal, the programming instrument « Node-RED » was chosen to comm unicate with related devices, assemble data and send orders. This gadget gives a visual stream director on the program to send alerts and control the structure's sensors and actuators. The improvement stage « Node.JS », considering the « Chrome V8 » JavaScript engine, means to transcendently manage devices' data by adding it to an ongoing informational index. Setting up the open-source instrument « Sqlite3 » offers incredible execution meaning to save the whole data. The ceaseless correspondence between the server and the different savvy equipment is spread out through the MQTT show. The designing of the local server is shown in figure 2. It is depicted by its little size, low energy usage and of server (QoS).

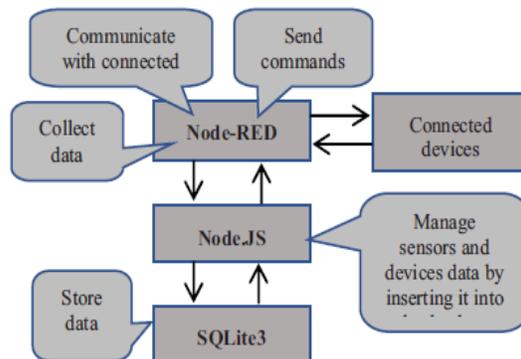


Fig. 2: Local server Operating principle

Vocal Communication

One of the principal conclusions of the robot is its ability to bestow and interface in a certifiable voice close to that of the human. The vocal correspondence stage's designing is shown in figure 3. It goes probably as a mark of connection between the client and the humanoid. To do the smart voice accomplice, an assessment was driven; and the game plan picked, which fits well with the plan of the wise house, is the usage of « Mycroft AI » open stage. The proposed vocal correspondence system was worked around Mycroft programming application. Mycroft presents an open-source programming stage that licenses specialists to add an electronic thinking (AI) voice partner to any device. Considering the python programming language,

it includes a couple of interconnected parts that direct talk obtainment, watchword affirmation and talk to message, as well as message to talk change. Each Mycroft application has a couple of capacities that give different unequivocal features. At the point when the partner hears the wake-up word followed by a requesting, it looks for the relating mastery to bring the adequate reaction. A couple of reasons were behind the decision of working with Mycroft AI. In any case, it's open and nonintrusive programming, while other notable advances, for instance, Google Home or Amazon Alexa, are in consistent contact with people's profile and individual data. Second, it guarantees an unprecedented level of wellbeing by discarding the risks of covert work. Moreover, Mycroft modules are planned to be presented locally on an embedded structure, which offers the possibility working in disengaged mode.

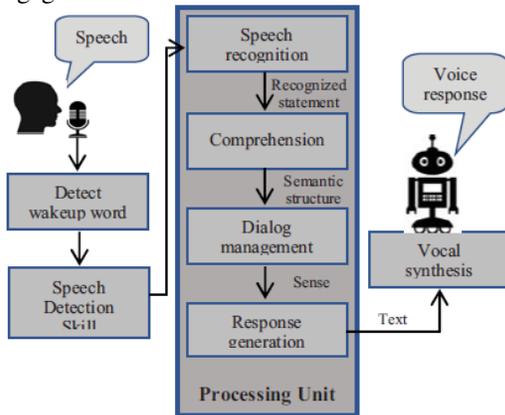


Fig. 3: Vocal Platform Architecture

Image Processing

The ability to see people and find their appearances structures one of the basic humanoid capacities. The vision structure mounted on the robot grants it to be more splendid and better seen by its ongoing situation. Its general working is point by point in figure 4

The image taking care of stage uses python and the OpenCV library. A couple of significant learning computations were done for the face revelation and affirmation process.

Thusly, all crucial courses of action were made to ensure the correspondence between the vocal and the vision systems. This grants us to demand that our robot perceive, count or find people's appearances through voice orders. The gathering of steps for the action of the vision system is organized in the estimation in figure 5. The vision system takes in input, a voice request to ship off the video move through the camera. Along these lines, the made application search reliably for faces in the got pictures. The course of action record « haarcascade_frontalface_default.xml » grants a viable and fast disclosure all through the refined tests. At the

point when a face is recognized, the image is changed over totally to the dull scale to remove the matching bearing vectors (X, Y, W, H). This cycle makes it possible to see people's appearances, resolve the robot-individual distance or to incorporate the amount of faces before the robot.

RESULT

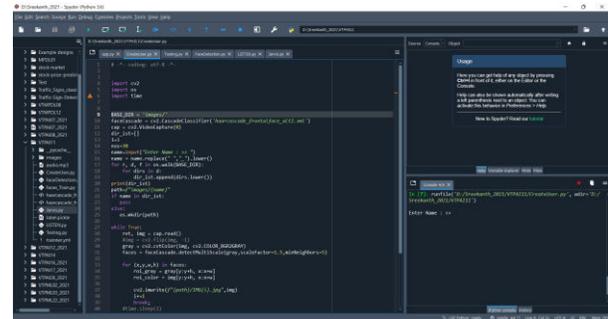


Fig 4. Spider Page

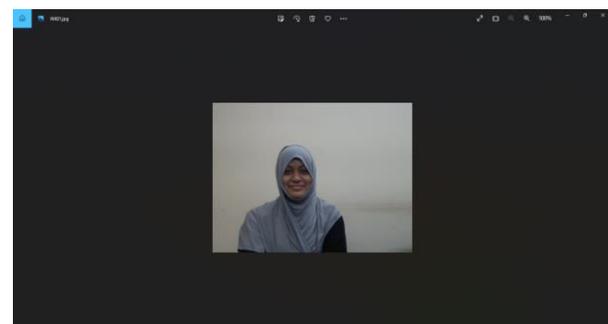


Fig 5. Input Data Page

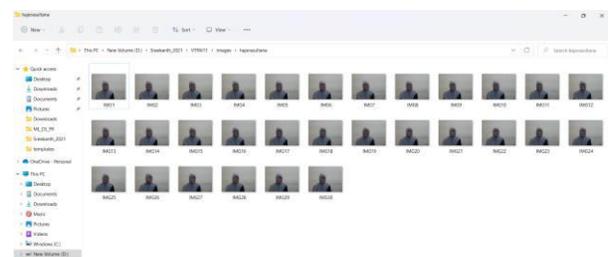


Fig 7. Spiting Images Page

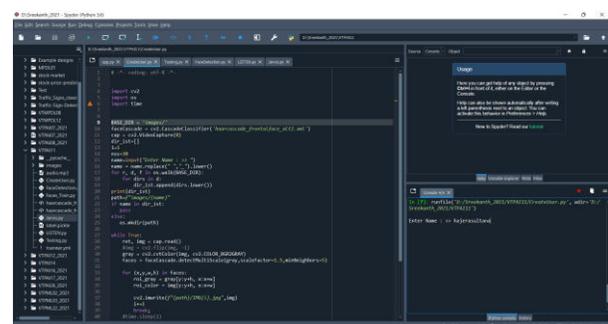


Fig 8. Output Page

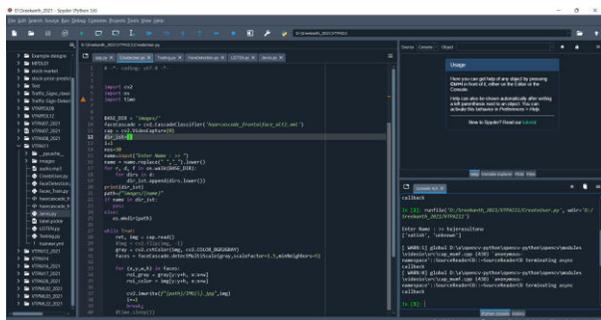


Fig 9. Output Text Page

CONCLUSION AND FUTURE ENHANCEMENT

In this paper, we presented a model of a Humanoid robot, planned to assist more established people in a clever with homing environment. Considering an open source plan, the totally autonomous wise robot, can interface with individuals too likewise with home contraptions. The item stage consolidates various applications did to see faces, set up tasks, and answer express requests and sales. The whole exercises made by the robot can be in sort of vocal reactions, mechanical moves and developments, programming endeavors or simply texts.

Future work the cultivated results show the way that astute teammates can be used to control devices and machines in our homes and show many kinds of knowledge that the robot can perform to address the client's solicitations.

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