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# Dora: Digital Office Reception Assistant

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***Abstract:*** *DORA is an innovative project aimed at mod-ernizing the role of a traditional receptionist using artificialintelligence. With its array of features, including text-to-speech capabilities, voice-enabled response, and an alcohol detection function, DORA proves to be a valuable tool, especially foreducational institutions. By leveraging natural language pro-cessing, DORA can efficiently handle incoming phone callsby identifying the purpose and redirecting them accordingly.Additionally, it warmly greets visitors and connects them to the appropriate department or individual. Furthermore, DORA ex- cels in providing answers to frequently asked questions, assisting with appointments, admission bookings, and other administrativetasks. Notably, the alcohol detection capability of DORA ensuresan alcohol-free campus and fosters a healthy environment. Withits impressive functionality, DORA significantly enhances collegereception services, saving time and improving overall efficiency.*

***Keywords:*** *personal assistant, text to speech, call attending, face recognition, alcohol detection.*

## I.INTRODUCTION

Artificial intelligence (AI) has made remarkable advance- ments in recent years, particularly in the realm of interactive conversational systems.It focus on enabling natural dialogue between humans and machines.AI has given rise to virtual as- sistants like Microsoft's Cortana, Apple's Siri, Amazon Alexa, Google Assistant, and Facebook, which have become integral parts of our daily lives. These systems have transformed how we interact with technology, making tasks easier and more efficient. Building upon this progress, we are proud to unveil our latest innovation in the field of AI: Dora, the office receptionist robot. Dora represents a significant leap forwardin the integration of AI and robotics, with a specific focuson addressing the critical issue of teenage alcohol abuse. Alcohol abuse among teenagers continues to be a pressing concern, with detrimental consequences for both individuals and society as a whole. Despite the dangers and negative outcomes associated with drug and alcohol experimentation, some adolescents still perceive it as a rite of passage, influ- enced by societal factors and peer pressure. Recognizing the urgent need for effective prevention and intervention strategies, we have developed Dora as a proactive solution to mitigatethe risk of teenage drug addiction. Dora is not an ordinary receptionist. Equipped with state-of-the-art AI technology, shehas the ability to engage in natural, human-like dialogue and provide visitors with detailed information about our organiza- tion through speech output. But her capabilities go far beyond that. With a sophisticated combination of computer systems and high-definition cameras, Dora can detect and greet guests as they arrive at our college, guiding them to their desired location if needed. However, what truly sets Dora apart is her unique alcohol detection capabilities. Utilizing advanced algorithms and machine learning techniques, Dora can identify symptoms of intoxication in guests. By analyzing subtle cues. she can accurately determine if someone has consumed al- cohol. The importance of this feature cannot be overstated. Promptly detecting signs of alcohol usage allows Dora toplay a vital role in ensuring the safety and well-being of our guests. In the event that intoxication is detected, Dora swiftly notifies the appropriate authorities, enabling them to intervene and provide the necessary support and assistance. By taking immediate action, we can prevent potential accidents, safe- guard individuals, and minimize the risk of further substance abuse. We recognize that substance abuse among teenagers isa multifaceted issue that requires a comprehensive approach. While Dora contributes to the prevention of alcohol-related incidents we are committed to working in collaboration with educators, parents, and community organizations to implement effective prevention and intervention strategies. By combining Dora's technological capabilities with educational initiatives, counseling services, and community outreach we aim to ad- dress the root causes of teenage alcohol abuse and promote healthier choices among our youth. Dora, our receptionist robot, represents a significant step forward in the integration of AI and robotics for social good. By harnessing the power of advanced technology, we strive to create a safer environment for teenagers empowering them to make informed decisions and navigate the challenges they face during their formative years. Together, let us stand at the forefront of innovation and drive positive change in the fight against teenage substance abuse.

## II.RELATED WORKS

A. Huddar, C. Bysani, C. Suchak, U. D. Kolekar and K. Upadhyaya, 2020 et,al.,[1]proposed a Chatbot is an AI software program that conducts conversations via auditory or textual methods, simulating human behavior and commonly used for customer services or information acquisition, now growing in usage across sectors such as banking, entertain- ment, news, and medicine, and in this project, a chatbot is being developed to solve college FAQ queries that are user- friendly and accessible from anywhere.

Y. Li and Y. Zhang,2020 et.,al.,[2] proposed an Applying computer vision technology that involves continuous innovation and the development of various technologies, such asartificial intelligence and image processing. The basic conceptof computer vision technology is to study the cognitive ability of the computer which can replace the human brain and eye to produce high-quality images for processing. The working prin- ciple of computer vision technology involves image collection, processing, and intelligent identification to extract valuable information content.

W. Khaewratana, E. S. Veinott and S. M. Ramkumar et, al.,[3] "Development of a Generalized Voice-Controlled Human-Robot Interface: One Automatic Speech Recognition System for All Robots," 2020 3rd International Conference on Control and Robots (ICCR), Tokyo, Japan, 2020, pp. 38-42, doi: 10.1109/ICCR51572.2020.9344123.

Y. Tang, J. Pino, C. Wang, X. Ma and D. Genze,2021 - 2021 et.,al.,[4] The proposed approach in this study is to usea denoising autoencoder task jointly trained with the ASR task with monolingual data while a machine translation task is co-trained with ST task with parallel data, which can effectively reduce word error rate. Different design choices for the joint training system are also carefully studied, including strategies to share the text and speech encoders and comparing the joint training system with models initialized from pre-trained components.

S. Kumari, Z. Naikwadi, A. Akole and P. Darshankar, 2020 et.,al.,[5] In this study users use graphical user in- terfaces (GUI) to give commands to the computer. In caseof conversational interfaces the user can communicate with computer in their natural language instead of giving command or using GUI. For this to be possible, there is use of natural language processing (NLP) so that the computer will be ableto understand the meaning of the input given by the user and perform the task accordingly.

Z. -B. Chen and Y. Liu, 2020, et.,al.,[6] In this study emerging technologies such as cloud computing, big data, AI, and the Internet of Things are transforming the traditional hotel industry into smart hotels. AI technology is advancing face recognition, integrating management and service for guests through face recognition in smart hotels

V. Këpuska and G. Bohouta, 2018 et.,al.,[7] This approach is to designing the next-generation of virtual personal assistants includes gesture recognition, image/video recognition, speech recognition, vast dialogue and conversational knowl- edge bases, and a general knowledge base.Added components to the original structure of general dialogue systems to create a multimodal dialogue system, such as an ASR Model, Gesture Model, Graph Model, Interaction Model, User Model, Input Model, Output Model, Inference Engine, Cloud Servers, and Knowledge Base.

C. Yun, J. Ahn and Y. -H. Kim, 2013 et.,al.,[8] These robots make programming more interesting by allowing the resultsof programs to be expressed as robot behaviors. Visual pro- gramming languages (VPLs) have been combined with robots to make learning easier, as they consist of boxes and linesthat are easier to understand than other textual languages.This paper proposes using the open-source computer vision library, OpenCV, to implement computer vision techniques for an edutainment robot system.

S. Park, H. Lee, D. Hanson and P. Y. Oh, 2018 et.,al.,[9] This paper focuses on the arm motion generation, specifically the inverse kinematics (IK) of Sophia-Hubo's right arm using the Levenberg-Marquardt method with robust damping, torque control for handshaking, and generating joint motion trajectory using a combination of 5th polynomial functions for making gestures. The paper presents the IK simulation and torquecontrol scheme and joint motion trajectory generation.

C. Lauretti, F. Cordella, E. Guglielmelli and L. Zollo, 2017 et.,al.,[10] A new approach to movement planning and imitation learning is represented by Learning by Demonstration (LbD), where the human subject is observed during the task execution and the robotic systems replicate the learned move- ment. Therefore, LbD approach based on Dynamic Movement Primitives (DMP) seems to be very suitable for planning ADLmovements in assistive robotics and robot-aided rehabilitation.The main objective of this work is to resort to the LbD methodbased on DMP and proposed for improving motion planning strategies in rehabilitation and assistive robotics.

P. Dubey, K. Pal, B. Champaty and D. N. Tibarewala, 2014 et.,al.,[11] This technology can benefit differently-abled individuals and aid in rehabilitation, offering hands-free opera- tion and increased independence. Examples include controlling robotic arms and wheelchairs with voice commands. A cost- effective voice-activated system was developed to controla quadbot rehabilitation aid, with two modules for signal acquisition and servo motor control, wirelessly communicating via Xbee protocol for simplified user control.

B. D. Etter, M. R. Duck and R. L. Seaman, 1990 et.,al.,[12] In a preliminary study, a six-degree-of-freedom RTX SCAM robot with a two-finger end-effector was controlled by voice and optoelectronic sensors to aid physically disabled individuals. A vocabulary of 20 phonetically dissimilar voice commands was developed, including a command to initiate automated grasping, and an optoelectronic sensor array was developed for automatic symmetric grasping of nearby objects, eliminating the need for cumbersome keyboard-based or voice-directed robot grasping.

M. R, M. D and R. P,2020 et.,al.,[13] Images of studentsare captured and analyzed using techniques such as brightness evaluation and feature extraction to identify and record attendance. Facial recognition algorithms such as Eigen face and PCA are used for this purpose. The system requires training with student ID card photos and a camera placed near the classroom entrance.The camera is placed near the classroom entrance, and the input is fed through data to the control system provided with the camera. Various processes like Eigen face, PCA, and LDA hybrid algorithm are being used to identify and record attendance.

A. Banerjee, S. B. Amreen Saba, S. Rana and S. Chakraborty,2020 et.,al.,[14] This paper discusses the impor- tance of text-to-speech (TTS) technology and how end-to-end text-to-speech (E2E-TTS) models have improved the sound quality and naturalness of synthesized speech. The challenge of synthesizing expressive speech is addressed, and the use of condition vectors to control the expressive TTS model is explained. The difficulty of deploying E2E-TTS models in real-world applications due to database issues is discussed, and speaker adaptation and emotion transplantation techniques are proposed as solutions.

M. B. chandu and K. Ganapathy, 2020 et.,al.,[15] The paper discusses the importance of text-to-speech (TTS) technology and how end-to-end text-to-speech (E2E-TTS) models have improved synthesized speech quality and naturalness, addressing the challenge of synthesizing expressive speech andproposing solutions for real-world deployment issues, includ- ing speaker adaptation and emotion transplantation techniques, and presenting an effective emotion transplantation technique that preserves expressiveness characteristics during adaptation,which is evaluated through objective and subjective experiment.

## III.PROPOSOD SYSTEM

DORA is a sophisticated system that relies on a laptop or computer as its central component. Once the power supply is turned on the program code is executed, initiating the system'soperation. Input is acquired through the connected microphoneand camera. The microphone captures speech signals, while the camera captures visual signals. To process and analyze these inputs, the system compares them to the data stored in its database. This comparison allows the AI Receptionist to understand and interpret the information provided by the user. The output components of the system include a speaker and a display which deliver audio and visual outputs, respectively. To process the speech signals received from the microphone, the AI Receptionist employs Natural Language Processing (NLP) techniques. This enables the system to understand and extract meaning from the spoken words. The display, on the other hand, is responsible for presenting visual signals enhancing the interaction between the receptionist and the client. Further- more, DORA utilizes Convolutional Neural Networks (CNN) to examine whether a person has consumed alcohol. This functionality enables the system to detect alcohol consumptionbased on visual cues. If such behavior is identified, it saves the relevant details in an Excel sheet and promptly sends the information to the responsible authorities. By incorporating a display into the system, the communication between the recep-tionist and the client is made more effective. The visual outputs presented on the display enhance the interaction by provid- ing additional information, instructions, or feedback. DORA combines various components, such as the laptop/computer system, microphone, camera, speaker, display, NLP, and CNN,to create an advanced and efficient receptionist system that canunderstand and respond to user input, detect alcohol consump-tion, and facilitate effective communication. fig2 shows the graphical representation of the whole project as a flowchart.

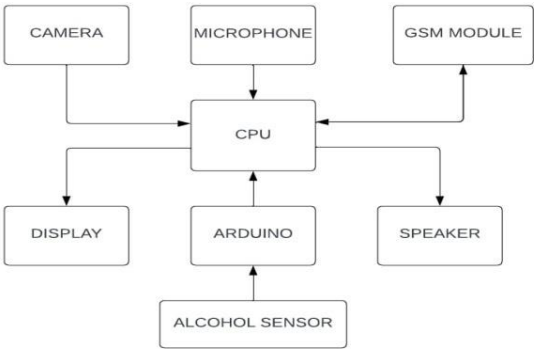


*Fig. 1. block diagram*

## IV.EXPERIMENT

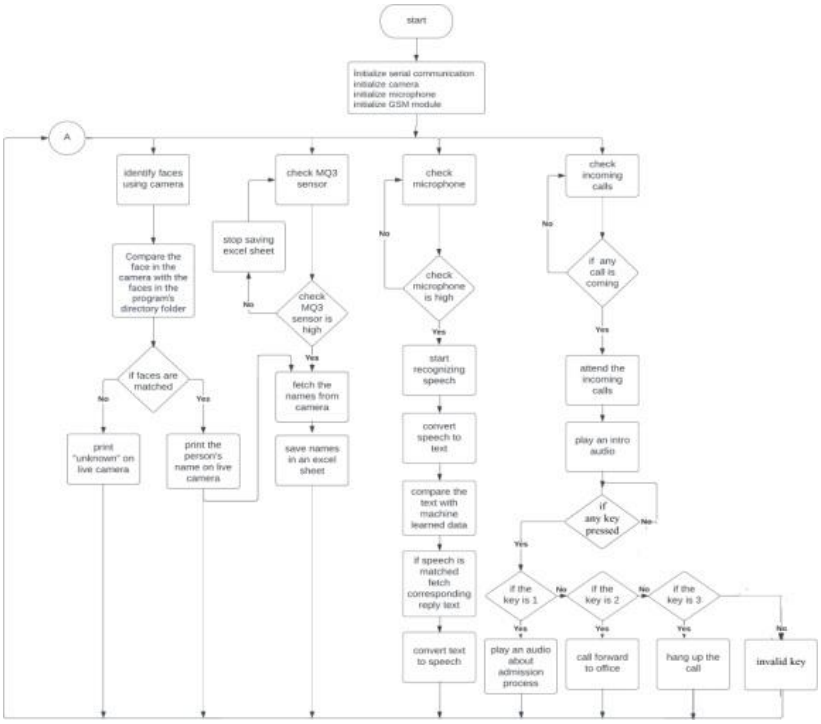


*Fig. 2. Flowchart*

we conducted experiments in our college based on the application of face recognition ,speech recognition, alcohol detection, call attending and selected 10 college students .In the case of face recognition, we selected sample photos of 10 students and trained the data by extracting features such as eyes, nose, etc. We associated names with these features. For experimental purposes, when a student stands in front of the camera, their face is captured, and the features are extracted. These features are then compared with the previously trained data to identify the person, displaying their name on the screen.If the face is unknown, it is labeled as ”unknown.”In this experiment, the correct identification rate was 90percentage.

While 10percentage of the attempts failed. These failures were primarily caused by changes in facial features, such as modifications, accessories, and instances of misidentifying someone as a match. Another feature included in the projectis the attending feature, which utilizes a GSM module. When an incoming call is received, the system automatically answers the call and plays an introductory audio message. This message provides instructions for the caller to press specific keys to obtain details or information.If the caller presses key 1, an audio related to admission is played, providing relevant information on the topic. If the caller's query is not resolved or they wish to connect to the office directly, theycan press key 2, and the call is forwarded to the office. In this particular feature, the system achieves a 100 percentage accuracy rate.Furthermore, if key 3 is pressed, the call is immediately disconnected. Dora has another feature known as alcohol detection, which utilizes an MQ3 alcohol sensor. In this experiment, the presence of alcohol is checked using a sanitizer. When the sensor detects the presence of alcohol,it identifies the person in front of the camera and stores their details in an Excel sheet. However, this feature has an accuracy rate of 20percentage due to its limited coverage area. It may encounter failures or false readings when individuals consume substances similar to alcohol. Next, there is the speech recognition feature, which involves communication through a microphone. In this experiment, a set of 10 students were selected, and the system was trained using existing data. Based on the questions asked, the system provides replies.For instance, if asked, ”Where is the college?” it replies with ”Vallivattom, Thrissur.” However, this feature has an accuracy rate of less than 50percentage due to network issues. It occasionally provides incorrect responses as well.

| FEATURE | TEST ATTEMPTS | POSITIVE RESPONSE | NEGATIVE RESPONSE | | ACCURACY |
|---|---|---|---|---|---|
| | | | False positive | False Negative | in% |
| Speech Recognition | 10 | 5 | 3 | 2 | 50 |
| Attending phone calls | 10 | 10 | - | - | 100 |
| Face Recognition | 10 | 9 | 1 | 0 | 90 |
| Alcohol detection | 10 | 2 | 5 | 3 | 20 |

*Table1: Experiment Results*

## V.RESULT AND DISCUSSION

### A. Speech Recognition

Speech recognition in DORA gives ability to gives input through microphone of system, such as voice commands (e.g. ”What is the name of college”)

### B. Voice Commands

1) Manual Mode: In manual mode user will have to interact with DORA for every voice command. User will input a command to the system and gives reply. Again if the user wants to ask new question he should again press the voice command button.
2) Auto Mode: Auto mode is like a real conversation UI. When auto mode is on user can have a back-to-back conversation with DORA like he is talking to a real human be-ing.DORA uses Text-to-speech to answer the question throughspeakers.

### C. Face recognition

The project involves employing CNN (Convolutional Neural Network) technology for face recog- nition. After capturing the face through a camera, the system utilizes CNN-based face recognition techniques to identify theperson. The person's name is then displayed on the screenas the result of the recognition process. This integration of CNN technology enables accurate and efficient identification of individuals based on their facial features.

D. Automated Call Response System DORA is a comprehen- sive feature included in the project that acts as an Interactive Voice Response System (IVRS) for call attending. When a call is received, the AI Receptionist utilizes advanced artificial intelligence techniques to answer user queries based on the data stored in the database. If the AI Receptionist is unable to resolve the queries, it politely seeks the user's permissionto transfer the call to the appropriate office or department.This streamlined and intelligent call attending system enhances customer service by providing automated assistance while ensuring that complex or specific queries are handled by the relevant personnel.

E. Integrated Alcohol Detection and Face Recognition Sys- tem Project incorporates an alcohol detection feature alongside its primary functions. Equipped with an alcohol sensor, the receptionist is capable of detecting individuals who may be under the

influence of alcohol. Upon detection, the system employs face recognition technology to identify the person. The relevant data, including the person's identification and alcohol detection status, is then stored in an Excel sheet. Furthermore, the system automatically sends this information to the higher authority, ensuring appropriate action can be taken as necessary. This integrated solution enhances security and assists in maintaining a safe and responsible environment.

## VI.CONCLUSION

DORA Digital office reception Assistant is an innovative project designed to revolutionize traditional receptionist services. It combines cutting-edge technologies such as face detection, natural language processing, alcohol detection, and GSM communication to create an efficient and intelligent reception assistant. The primary components of DORA include a camera, microphone, laptop, GSM module, speaker, display, Arduino, and an alcohol sensor. The camera, serving as the robotic eye, employs face detection to identify individuals approaching the reception area. The microphone captures natural language spoken by visitors and converts it into text for further processing. The replies given by DORA are generated based on the information stored in the database. One unique feature of DORA is its ability to detect alcohol through an alcohol sensor. If alcohol is detected on a person's breath, it triggers a face recognition process and provides relevant information to higher authorities. This functionality can be crucial in maintaining security and ensuring a safe environment. Additionally, DORA can attend phone calls using the GSM module, functioning similarly to an interactive voice response system (IVRS). Visitors can ask queries verbally or type them, and DORA will provide appropriate responses. This enables a seamless and efficient communication experience for users. The advantages of implementing DORA are numerous. It can effectively attend phone calls and eliminate the need for a human receptionist, providing 24-hour service without requiring a salary. By incorporating alcohol detection, it enhances security measures and ensures the safety of visitors. DORA also creates a humanoid appearance, making it more approachable and user-friendly. Its lightweight and portable design enable easy transportation, and the implementation process is relatively simple and cost-effective. Overall, DORA's project aims to provide a comprehensive and intelligent reception assistant solution by leveraging modern technologies. It combines hardware components with program-oriented software, offering a range of advantages such as enhanced functionality, improved security, cost savings, and ease of use.

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