International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 06 | June 2019 www.irjet.net p-ISSN: 2395-0072

NEXT GENERATION SYSTEM ASSISTANT

Apoorva Namdev Patil [1], Akash Sunil Raut[2], Arkam Ayaz Sayyed[3]

[1,2,3]Student of Computer Engineering, JSPM's JSCOE, Pune, India
[3]Professor S.H. Patil, Dept. of Computer Engineering, JSPM's JSCOE, Maharashtra, India

---

Abstract - *One of the goals of Artificial intelligence (AI) is the realization of natural dialogue between humans and machines. In recent years, the dialogue systems, also known as interactive conversational systems are the fastest growing area in AI. This paper also presents an assistance system for helping elderly singletons. The proposed system assists elderly singletons in the shortest possible time to report, the report also uses SMS intimate to achieve online report. This paper also proposes a novel approach to defining and simulating a new generation of virtual personal assistants as multi-application multi-domain distributed dialogue systems. The subject of the paper is a personal assistant design. The goal of personal assistant is a daily activities list planning. The Personal assistant will assist the customer that is human operator for planning is an optimum succession of desired activity.*

Key Words: **System Assistant, Artificial Intelligence, Voice Recognition, Speech Processing, Hand free computing, Secured.**

1. INTRODUCTION

As computing technology has become more advanced and less expensive, it can be built into an increasing number of devices of all kinds. However, a large section of visually impaired people in different countries, in particular, the Indian sub-continent could not benefit much from such systems. Many device has been designed and modeled to help normal people's daily routine. Due to busy schedule many technologies has been developed which can make people to do their work easily and without time consuming. One of the technologies is virtual assistant services can help you with every possible task you have to perform provided it does not need a physical presence. The range of tasks can vary from phone call answering to scheduling appointments and file management system working on voice commands. On giving input through voice or text, the system will recognize the voice and will give the following results as per demanded. In this way, it has introduced to the virtual reality. But this technologies must not only benefit normal people but also physically challenge people which includes deaf and dumb people. Our system will not only helpful to perform daily activities of normal people but it will also help physically challenge people for communication.

1.1 Purpose

The main goal of such an agent is to reduce the user's cognitive load. It is about the possibility to design a personal assistant (PA).

1.2 Problem Statement

The system assistant will help the user for communication, to communicate information, manage their daily activities. The system assistant performs tasks like calling, messaging, calendar, etc. The subject of the paper is a personal assistant design for normal and elderly people. The goal of personal assistant is a daily activities calling, messaging. The personal assistant will assist the user (human operator) for planning an optimum succession of desired activities.

2 OPERATING ENVIRONMET

2.1 User Interface

- Login Page
- Voice input

2.2 Hardware Interface

- Android Device which can accept/support voice commands.

2.2 Software Interface

- 1OS: Android.
- Coding language: XML, JAVA, Android.
- IDE: Android 3.2 version and/or Beta.
- Android Device with Following Configuration:
- Android version Min. Lollipop.
- 2GB RAM.
- Average network connection (min. 2G)

3 SYSTEM DESIGN

The development of the system assistant as a personal assistant is done to help users to cope with information overload. The idea is a software agent that behaves as a personal assistant who collaborates with and supports the user in various ways such as hiding the complexity of difficult tasks, performing tasks on the user's behalf, and helping the user to manage his/her own activities. The overall system design consists of following:

- Data collection in the form of speech.
- Voice analysis and conversion to text.
- Generating speech from the processed text output and Data storage and processing.

In first phase, the data is collected in the form of speech and stored as an input for the next phase for processing. In second phase, the input voice is continuously processed and converted to text using STT In next phase the converted text is analyzed and processed using Java to identify the response to be taken against the Command. Finally once the response is identified, output is generated from simple text to speech conversion using TTS.

- Operates on Voice input
- Accessibility of application
- Set Password
- Interactive voice response.
- Action

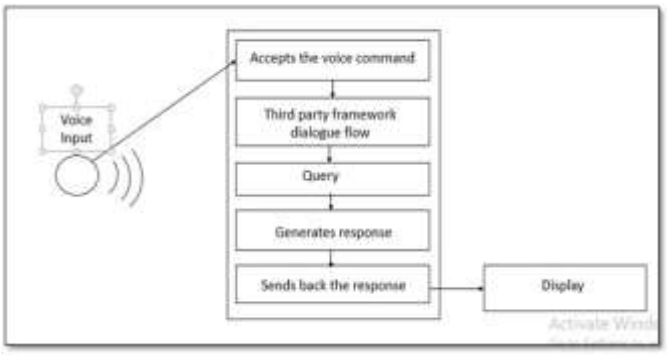

Fig -1: **System Architecture**

4 ALGORITHM

4.1 A Hidden Markov model (HMM) Algorithm

1. A hidden Markov model (HMM) is a statistical Markov model in which the system being modelled is assumed to be a Markov process with unobserved (*hidden*) states.
2. A Hidden Markov Model is a collection of states connected by transitions.
3. It begins in a designated initial state.
4. The HMM can be thought of as a black box, where the sequence of output symbols generated over time is observable, but the sequence of states visited over time is hidden from view. This is why it's called a *Hidden* Markov Model.

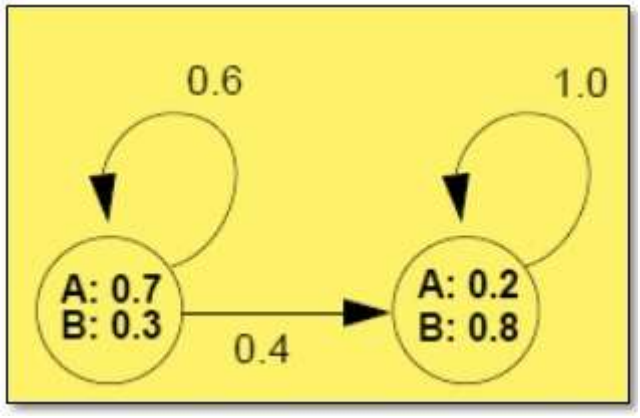

Fig -2: A simple Hidden Markov Model, with two states and two output symbols, A and B

4.2 DYNAMIC TIME WARPING (DTW)

1. The simplest way to recognize an *isolated* word sample is to compare it against a number of stored word templates and determine which the "best match" is. First, different samples of a given word will have somewhat different durations.
2. However, another problem is that the rate of speech may not be constant throughout the word; in other words, the optimal alignment between a template and the speech sample may be nonlinear. Dynamic Time Warping (DTW) is an efficient method for finding this optimal nonlinear alignment.
3. Dynamic time warping (DTW) is a well-known technique to find an optimal alignment between two given (time-dependent) sequences under certain restrictions intuitively; the sequences are warped in a nonlinear fashion to match each other.
4. Originally, DTW has been used to compare different Speech patterns in automatic speech.

5. MATHEMATICAL MODEL

The mathematical model (representation) of an *activity* is a vector with the mentioned components. Here, tsi ∈0,1440 *si t* is the stating time; Δ ∈0,1440 *i t* is the duration; *p p* =1, *n* is the number of the related place; *r*∈{0,1} models the need of related activities;

$$A_i = \begin{bmatrix} t_{si} \\ \Delta t_i \\ p \\ r \end{bmatrix}$$

The **goal list** is an unordered list of activities that the user intends to perform in a day. The mathematical model (representation) for a goal list is a set of activities (2).

$$T_{cl} = \{A_1, \ldots, A_k\}$$

The mathematical model (representation) for a *proposed list* is a set of activities in a particular order

$$L_p = \{A_j^1, A_k^2, \ldots, A_r^n\}$$

The consistencies checks are necessary conditions in order to perform the activity *i* , in the place *pj* for the imposed (by the user) time domain of the list,

$$\Psi = \begin{cases} pa_{ji} = 1 \\ t_{ai} \geq t_c(i-1) \\ t_{ai} \in (t_{oj}, t_{cj}) \\ (t_c + \Delta t_i) \in (t_{oj}, t_{cj}) \\ t_c(i) = t_c + \Delta t_i < T_{max} \end{cases}$$

where: for *paj,i* see (9); *tc* is the current time after performing the activity *Ai-1; toj* and *tcj* are the opening, respectively the closing time of place *pj* (11); Δ*ti* is the activity *i* duration; the time domain of the list is an interval between two values Δ*T* = *[Tmin , Tmax]*

The mathematical model of planning contains the concept of **Cost function.** This is a function which computes the necessary amount of time to accomplish a particular activity. In general a cost function has two components: the transportation time and the activity duration. The *cost function* mathematical model is:

$$C = wa \cdot CA + wt \cdot Cti$$

where: *CAi* is the activity *i* duration (Δ*t*); *CTi* is the transport duration from place *pj* (previous place) to place *pi*; *wai* and *wti* are the weight of activity *i* and transportation *j-i* according to the list context

$$CA = delta\ t = f(calenD, ts, event)$$

Where once again *gji(calenD,ts,conveyance,event)* is a discrete function depending on: *calenD* calendaristic date; *ts* starting time; conveyance; event;

The schedule matrix, is a matrix which associate for each place an opening and closing time

$$PT = \begin{bmatrix} p_1 & t_{o1} & t_{c1} \\ . & . & . \\ p_{n_p} & t_{on_p} & t_{cn_p} \end{bmatrix}$$

where: *toi* and *tci* is the opening, respectively.

6. SCREEN SHOTS

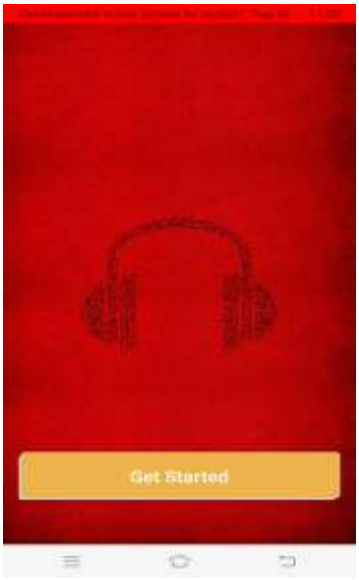

Fig 1: Flash Screen

Fig 2: User Information page

Fig 3: User Information

Fig 4: Date of Birthday

Fig 5: Welcome Page

Fig 6: Accept User Request 1

Fig 7: Small Talk

Fig 8: Set Voice Password

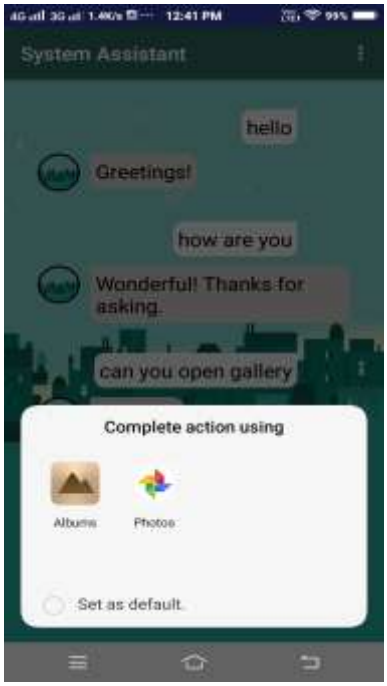

Fig 9: Performing task.

7. FUTURE SCOPE

The system assistant is designed to help all the people to perform their daily activities and also to perform some task. It is designed in such a way that it can be beneficial to physically challenged people (dumb and deaf) so that they can also communicate with each other using this application and also can various perform task.

The input is given in voice format. The system assistant works on the voice commands or text commands. The aim to add more universal language and to also have an advanced GUI along with to add task like scheduler and on voice command notes.

8. CONCLUSIONS

The system assistant is designed to help all the people to perform their daily activities and also to perform some task. It is designed in such a way that it can be beneficial to people in performing its regularly activities by voice command using this application and also can access to various application by giving voice command.

The input is given in voice format. The system assistant works on the voice commands or text commands. Tasks like calling a person, messaging a person, interactive response i.e. small talk, etc.

9. REFERENCES

[1] D. Jurafsky and J. Martin, Speech and Lunguage Processing. An Introducfion to Natural Language Processing, Comjmtational Linguistics and Speech Recognition. Prentice Hall, 2000.

[2] K. A. Kemble, An Iniroduction to Speech Recognition. Voice Systems Middleware Education - IBM Corporation, 2001,

[3]191 A. KOlzer, "Universal Dialogue Specification for Conversational Systems", Proceedings of IJCM 99 - Workshop on Knowledge and Reasoning in Practical Dialope Systems, 1999.

[4] N. Oishi and J. Schacht, "Emerging treatments for noise-induced hearing loss," Expert Opinion on Emerging Drug, vol. 16, no. 2, pp. 235-245, 2011.

[5] A. Ogoreve and B. Loncarevic, "iHLEP emergency care network," in Proceedings of the 2014 37th International Convention on Information and Communication Technology, Electronics, and Microelectronics (MIPRO'14), pp. 252-255, 2014.

[6] D. C. Das and T. Alam, "Location based emergency medical assistance system using OpenStreetMap," in Proceedings of the 3rd International Conference on Informatics, Electronics & Vision (ICIEV'14), pp. 1-5, 2014.

[7] M. Wirz, D. Roggen, and G. Troster, "User acceptance study of a mobile system for assistance during emergency situations at large-scale events,"in Proceedings of the 2010 3rd International Conference on Human- Centric Computing (HumanCom'10), pp. 1-6, 2010.

[8] D. Milward, and M. Beveride, "Ontology-Based Dialogue Systems", Proceedings of Infernational Joint Conference on Arfificial Intelligence IJCAI - 03, Acapulco, Mexico, 2003.

[I31 E. C. Paraiso, J.-P. A. Barthes and C. A. Tad& "A Speech Architecture for Personal Assistants in a Knowledge Management Context", Proceedings of ECAI – European Conference on Arfificial Intelligence, Valence - Spain, 2004.

[9]J. R. Searle, "A Taxonomy of Illocutionary Acts", Proceedings of Language. Mind und Knowledge, Vol. 7, University of Minnesota Press, 1975, pp. 344-369.

[10] L. M. Spinosa, C. 0. Quandt and M. P. Ramos, "Toward a Knowledge-based Framework to Foster Innovation in Networked Organisations", Proceedings of CSCWD 2002, Rio de Janeiro -Brazil, 2002.

[11] C. A. Tacla and J.-P. A. Bathes, "From desktop operations to lessons learned", Proceedings of The Seventh International Conference on CSCW in Design, Rio de Janeiro, 2002.

[12] S. WU, H. Ghenniwa and W. Shen, "User Model of a Personal Assistant in Collaborative Design Environments", Agents in Design, MIT, Cambridge, USA, 2002, pp. 39-54n System Sciences 2011.