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IoT Based Movie Recommendation System Using Raspberry Pi

Mrunal Ghorpade¹, Gautami Jagtap², Nupur Bhagwat³, Payal Takawale⁴

¹MMCOE Computer Savitribai Phule Pune University

²MMCOE Computer Savitribai Phule Pune University

³MMCOE Computer Savitribai Phule Pune University

⁴MMCOE Computer Savitribai Phule Pune University

¹mrunalghorpade.comp@mmcoe.edu.in; ²jagtapgautami.comp@mmcoe.edu.in;

³bhagwatnupur.comp@mmcoe.edu.in; ⁴takwalepayal.comp@mmcoe.edu.in

Abstract— Nowadays, much attention is paid to smart applications that act as intelligent assistants to users. Such applications can understand context, adapt to a situation, and deliver their services in a proactive style. A particular case is personal assistant or recommender systems, which support the users in their decision-making and other different activities. The Intelligent Personal Assistant (IPA) enables users to give input by natural language dialogue through a microphone and performs the assigned task. The IPA makes use of a microphone and a speaker. The user interface to the IPA is the voice of the client. The IPA is implemented using a raspberry pi platform and includes a special algorithm creating Intelligence artificially.

Keywords— Raspberry pi, Naive Bayes, IOT, TTS, STT, Bluemix, Node Red, Watson Services.

I. INTRODUCTION

The intelligent agent:

The intelligent agent has the ability to talk in natural language with user to convey information. This agent identifies the user's personal information which can help in determining the user's choice of entertainment. In the wake of the digital age, the personal assistant can retrieve information like movie show times, movie screening locations and so on.

Importance of reviews from social media:

The social media offers a new creative way of sharing opinions about the movies that are created so enormously. There are certain categories in the online reviews: reviews by critics, reviews by general audience, etc. Although there is huge and diverse information, a little analysing helps in making a decision. Various algorithms can be used in mining this information.

IoT awakening:

In the advent of recent technologies, IoT is by far the most wide spreading development. It provides the users all over the world with an access to the services based at remote locations. IoT can thus help us obtaining services on the go.

II. PROJECT DESCRIPTION AND SCOPE

The basic aim of the project is to recommend movies according to the user’s current mood. The present mood of a particular user is the primary input for the system. This input is accepted from a web based system program. This program forwards it to the TTS engine on our space on the IBM Bluemix™. A through survey was made on the mood based movie selection of around 400 people. This survey was used as the basic data for our core component based on Naive Bayes classification. Naive Bayes classifier helped in classifying a specific movie genre based on the specific mood habits of people from different age groups. The result is updated by the classifier and forwarded to the selection module. Which selects movies from our genre based csv files and updates it to the TTS engine on the Raspberry Pi. The raspberry pi then produces a speech output.

Currently with the IOT architecture, we have our recommender system but in future, any sort of IOT speech input based application can be added up to this framework.

III. ARCHITECTURE AND ARCHITECTURAL PARADIGMS

A. Architecture Diagram

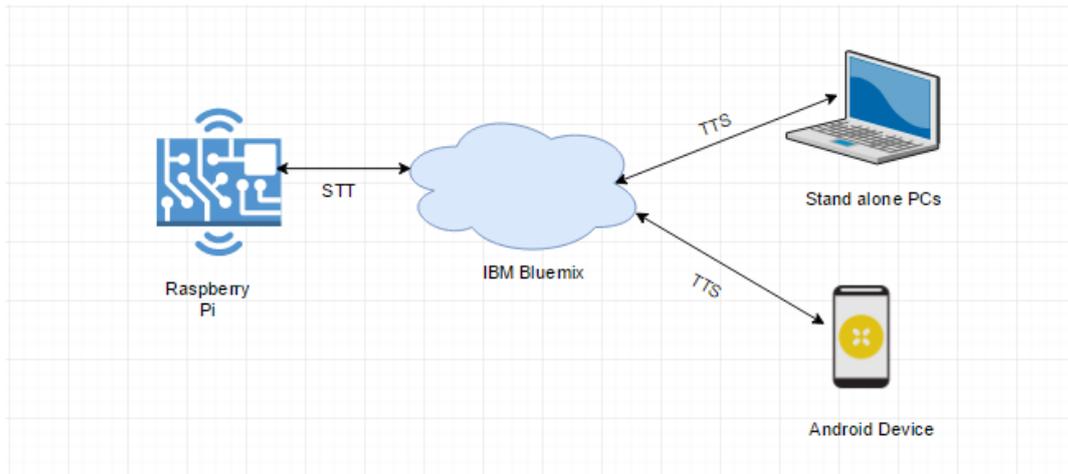


Fig. 1. Architecture Overview

The above diagram shows a high-level view of the architecture. As the project is IoT-Based, the interaction of the devices and the raspberry pi embedded board takes place through a cloud facility.

B. Architectural overview

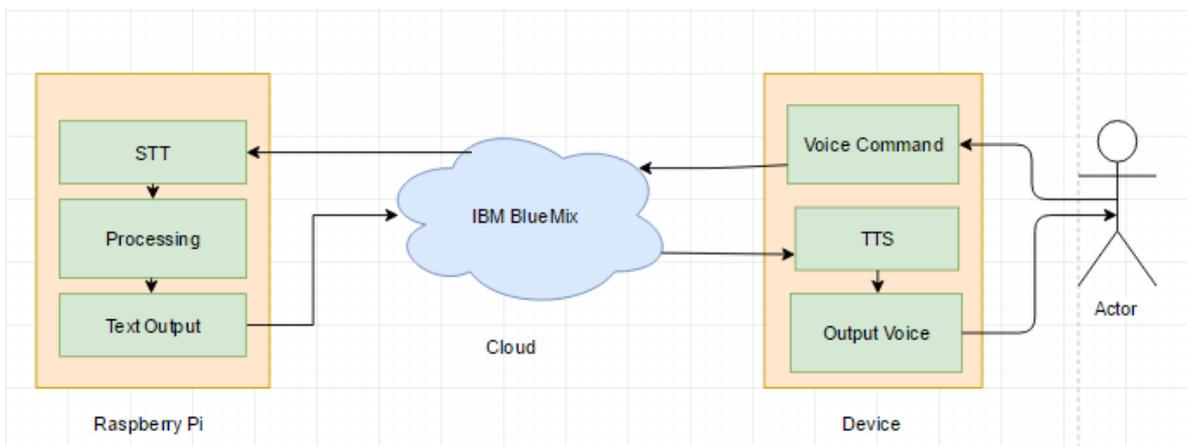


Fig. 2. Architecture Details

The above diagram shows the detailed internal structure of the architecture. The user gives a voice input to the portable device like a cell phone. This input is transferred to the pi via the cloud. The raspberry pi is responsible for the Speech-to-text recognition of the voice query. Once the query is obtained, it is fed to the movie module. The output of the movie module is a recommendation of a movie name in text format. This output is then sent back to the enquiring device. The device converts the text output back to speech using TTS module. Thus, the user gets a voice output recommendation.

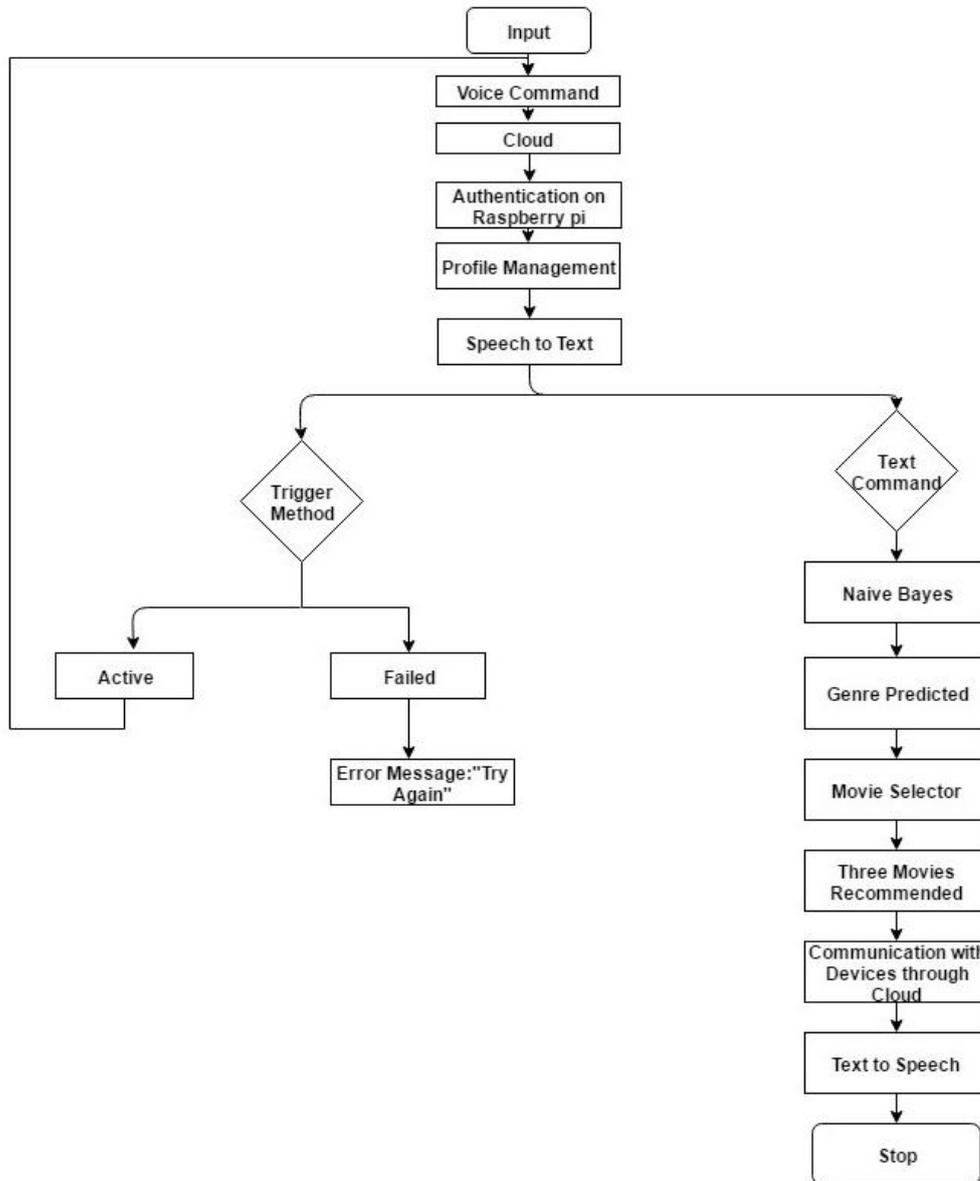


Fig. 3.Flow Diagram

The above diagram depicts the detailed flow of the model. The voice input received from to user is transferred to the raspberry pi. On the pi, it is converted into text format. The movie recommendation is based on Naïve Bayes algorithm. Based on the genre provided, the movie selector selects random 3 movies which are rendered as output. This output is given back in voice format.

Working of the Naïve Bayes for recommendation:

The Naïve Bayes is primarily a classifier. This classifier makes use of different probability statistics to predict the most likely phenomenon. The Naïve Bayes classifier uses supervised learning and helps us classify a particular users profile for a specific movie title. A training data set is used for text classification and the basic theorem applied is Bayes theorem.

$$P(X|Y) = P(Y|X).P(X) / P(Y)$$

Where,

$P(X)$, $P(Y)$ = Prior Probability

$P(Y|X)$ = Conditional Probability

$P(X|Y)$ = Posterior Probability

The system uses profiles previously created. A few fields in the profiles are name, gender, age and other basic information. E.g.: Favorite actor, favorite genre, etc. The algorithm first takes a user's name as input. The second input is the mood of the user. Based on the mood, the Naïve Bayes predicts a genre of movies. Algorithm first calculates prior probability and based on the conditions it calculates conditional probability and by using basic formula of naïve Bayes algorithm it then calculates posterior probability which is output i.e. genre. A csv format file contains movie and genre mapping then the genre classified set of movies is used. Out of this set, three random movies are selected.

CONCLUSIONS

The movie recommendation provided by the system include three movies which are selected on the basis of a particular user's age group as the age factor is very important in selecting what movies one watches. The second factor taken into consideration is the mood of the user. Here, the mood is taken into consideration dynamically when the user requests for a recommendation. Primarily, four user profiles with their age are saved in the profile part of the program. And whenever one of those users invokes the program with their name and mood, their relative information is acquired and forwarded to the Data mining classifier which outputs the movie genre. Further movie genre is forwarded to the selection module which gives voice output of top three movies according to the user specifications.

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REFERENCES

- [1] "A.T.O.M (Artificial Intelligence Talking Omnipresent Machine)" International Journal of Innovative and Emerging Research in Engineering Volume 3, Special Issue 1, ICSTSD 2016
- [2] "Designing Personal Assistant Software for Task Management using Semantic Web Technologies and Knowledge Databases" Working Paper CISL 2013-11 Purushotham Botla
- [3] "A Case Study in Engineering a Knowledge Base for an Intelligent Personal Assistant". Vinay K. Chaudhri Adam Cheyer Richard Guili Bill Jarrold Karen L. Myers John Niekrasz Volume 3, Special Issue 1, ICSTSD 2016
- [4] "An Intelligent Personal Assistant for Task and Time Management" Karen Myers, Pauline Berry, Jim Blythe, Ken Conley, Melinda Gervasio, Deborah McGuinness, David Morley, Avi Pfeffer, Martha Pollack, and Milind Tambe AI Magazine Volume 28 Number 2 (2007)
- [5] "A Sandeep Kumar, Medha Sharma "Convergence of Artificial intelligence, Emotional Intelligence, Neural network and Evolutionary Computing" March 2012, pp 141-145.
- User Model Of Personal Assistant In Collaborative Design Environment", Weiming Shen Shumin Wu, 2002.
- [6] "Sentimental Analysis of Movie Review: A Study on Feature Selection Classification Algorithms", Sanjeev Ahuja, Tirath

Sahu, 2016.

[7] "Analysis User Ratings For Classifying Online Movie Data Using Various Classifiers To Generate Recommendations", Jyoti, Dr. Sanjeev Dhawan, Dr. Kulvinder Singh, 2015.

[8] "A Data Mining Approach to Analysis and Prediction of Movie Ratings", M. Saraee, S.White, J.Eccleston, 2004

[9] "An Improved Sentiment Analysis of Online Movie Reviews Based On Clustering For Box-Office Prediction", Nagamma P., Nisha K.K., 2015

[10] "Genre Specific Aspect Based Sentiment Analysis of Movie Reviews", Viraj Parkhe, Bhaskar Biswas, 2015

[11]"IoT Based Urban Climate Monitoring Using Raspberry Pi", Rohini Shete, Sushma Agrawal 44

[12] "A Ontology and Parser Dependencies Approach for Spoken Dialogue System", Mohammed Side Yakut, Roger Nkambou