

# Project Help Chatbot

<sup>1</sup>Sugandha Bhagwat, <sup>2</sup>S.S. Sridhar

**Abstract**--The growth of artificially trained machines such as chatbots are a major achievement in Computer Science. A Chatbot is a software that simulates the human behavior and carries out conversations in a human-like manner. It helps to analyze the opinions, emotions etc. that are exchanged by and between humans. Chatbots are considered to be a pseudo- human medium of interaction with a computer system or a software technology meant to make a user experience conversation with using artificial intelligence. The vast fields of Deep Learning and NLP toolkits have rendered engineers and scientists come up with creative applications of a chatbot to make life easier. This paper intends to introduce one ore unique application of chatbot which serves as a platform for the regular college students to find a perfect team for their projects. Students not only seem to face difficulty in choosing a team but also realizing the actual knowledge about the project they want to make. This chatbot gives just the right solution by matching the known skills using NLP pattern matching techniques to find the best suitable project with the required skill set. Students not only save time but also find suitable teammates with equally qualified knowledge.

In conclusion it will help to improve the efficiency of an individual as well as a team by contributing a helping hand to its members to lead them ti the success of their project.

**Key words**--Machine Learning, NLP, AI, Deep Learning

---

## I. INTRODUCTION

In the past few years artificially trained chatbots have grown at a very fast rate. Chatbots help users to interact with the backend of a machine in an efficient and user-friendly manner. Chatbots are a specially trained computer software that use artificial intelligence and machine learning algorithms to simulate human behaviour and enact human-like conversations. The chatbots use Natural Language Processing tools to analyze human conversations and extract meaningful informations and inferences from them.

The data which is present is mostly in an unstructured format which is not easy to analyze. Also it is time consuming and expensive to analyze such unstructured data. Chatbot categorizes the normal human conversations into a more organized form such that the data can be easily retrieved for further training and then present the required information in the form of natural human conversation.

Chatbots is used in various fields such as social media, brand monitoring, customer service, market research, counseling, etc. Chatbots help the users to better express and convey their views and thoughts.

In this paper we are discussing about the chatbot that helps college students interact with each other depending on the similarities in their interests and skill-sets. The students can take help of this chatbot by registering

---

<sup>1</sup>Dept. of Computer Science and Engineering, SRM Institute of Science and Technology, Chennai, India

<sup>2</sup>Professor, Dept. of Computer Science and Engineering, SRM Institute of Science and Technology, Chennai, India

their details with the chatbot by just answering some basic questions asked throughout the conversations carried out between the chatbot and the user. At the end of the questionnaire, a database is created for the user storing all the details given by the user.

This database is compared with the database of other users who have already registered with the chatbot's database. The users whose database gets the closest match to the current user's database, the members are asked to form a team. This enables the users of the chatbot to form a team with similar minded people looking for a team to work on a project.

## II. LITERATURE SURVEY

Musto. C. et al [1] has proposed a transparent recommender system which uses Linked Open Data cloud platform to make recommendations.

The black-box technique and collaborative filtering algorithms used increase the accuracy and efficiency of the system. The framework handles large dataset and also proves to be very interactive.

Piau, A. et al [2] has proposed a smart-phone application that optimizes the way older patients with cancer are monitored in real-time.

The seamless integration of the model with the health technologies available made this application model potentially feasible and precise. Although with increasing population, the acceptance of this system seems to be a major challenge.

Liao, Q. V. et al [3] surveyed on the Conversational Agents called Chatbots and their behaviour according to the environments they are applied to.

The author uses question answer technique to analyze the interaction of the chatbots with the users. The NLP toolkits used make the analysis seem to be quite accurate though major enhancements and developments can be further made.

Kucherbaev, P. et al [4] investigate upon the strategies involved in deploying Human Aided Bots to make them work in the real-time environments along with human interventions.

Even after huge amounts of training on the data acquired, the chatbots still face the limitations of less accuracy and large amounts of time used in training the large datasets.

Argal, A. et al [5] presented a chatbot that imitates a human travel agent. It is said to make predictive recommendations and inferences on the travel queries made by the user.

The factor that makes this application enhanced than other chatbots is that it is voice-enabled, though this results in huge training of datasets with NLP extensive tools and risking the accuracy of the system.

Lalwani, T. et al [6] has proposed an application of chatbots in colleges for seeking and retrieving information in a fast and efficient way by asking questions in the form of humanly conversations to enhance user interface.

The chatbot is limited to only specific purposes and needs to be more generic. Also the dataset needs to be able to work upon random unsorted data too.

Du Preez et al [7] provides an implementation of web- based voice recognition chatbot that generated responses that are user customized.

Though the voice recognition stands as an asset to the application, the huge dataset generated and trained makes this system costly and time taking followed by less accuracy.

Tvardik, N. et al [8] provides a study of the accuracy involved in using Natural Language Processing tools in the areas of healthcare and infections associated with it.

The results obtained stated that the accuracy rate was 84% whereas the sensitivity varied from 69.2% to 93.3% depending on areas of speciality.

Le, N. T. et al [9] proposed a cognitive assistant for improving the human reasoning skills and decision making capabilities of the users.

The assistant uses AIML and deep learning techniques to analyze human behaviour and generate responses accordingly. Although the dataset is less sensitive and training is slow, the model is pretty accurate and efficient.

Abdul-Kader et al [10] provides a survey on design techniques for chatbots in speech conversation systems.

The paper discusses about the new advancements in the field of chatbots and also states the differences and similarities between the various applications of a chatbot that take place in a specialized area.

Lokman, A et al [11] designs a chatbot for diabetic patients which not only intelligently responds to the patients needs and controls and maintains the diabetic parameters, but also remembers the path taken to reach the solution.

The framework has not been implemented but is considered to be of a feasible and accurate nature.

Cavedon, L. et al [12] provides implementation of an attention model called THAMBS to record the attention span and human behaviour while interacting with a robotic and artificially modelled device.

The results were believable and the model proved to be feasible with good accuracy when the users interacted attentively with the bot.

Rossen, B. et al [13] has proposed a crowd-sourcing method for developing virtual conversational agents for interacting with the users in such a way that they get a human like dialogue exchange experience while conversing with the agent.

It was found that inclusion of user speech rendered greater efficiency and accuracy along with easier interaction with the users.

Lokman, A. S. et al [14] provides a study on algorithms that provide relations between the responses generated by chatbot technology. The paper presents the technique of extension and pre-requisites to make the

Chabot converse in a more human- like tone and manner.

These two techniques are considered to be of a great importance to make the chatbot technology more accurate and humanly.

Bonarini, A. et al [15] proposes a modelling paradigm for the concepts and fuzzy models used to deploy behaviour- based robotics.

This paradigm makes the design of all the modules easy, since its primitives are expressive and enable simplicity. This design also deals with the uncertainties involved in sensing and modelling.

Nuruzzaman, M. et al [16] proposes and presents a survey of all the chatbots along with the various types and techniques used for their application.

The paper analyzes that almost 75% of the people face poor experience. The study proposes a new system with attention mechanisms using deep neural networks to tackle the problem of bad interface.

Serban, I. V. et al [17] designs a chatbot called MILABOT that is capable of carrying out small talk conversations through speech and text.

A novel reinforcement learning procedure was developed which results in increasing the efficiency of the chatbot with the course of time.

### **III. PROPOSED SYSTEM**

From the Literature Survey in the domain of chatbot done above we conclude that the field of chatbots is ever-growing and a very important for application in the currently trending technologies. We see that there were some challenges were faced in the implementations of chatbot applications such as the lack of accuracy [4] or the issue of training huge datasets within the time [7]. Limitations such as lack of human-like experience [7] and a need for the chatbots to be economically feasible created a need to develop chatbot technologies which not only are feasible in real-time but provide expected accuracy in desired time constraints.

The chatbot presented in this paper tackles the problem of huge datasets by not keeping a pre-existing dataset. Instead the chatbot trains on the data entered by the user in the form of answers to the questions asked by chatbot. Thus the data is trained in real time and very quickly. Also the need for an interactive dialog flow is satisfied in this model as the chatbot is in the form of a beautiful web application which makes the user interact with the chatbot even more.

Hence we propose to build a chatbot for helping out the students across the colleges by serving them with a platform to meet other students facing same issues in finding the right team mates for carrying out their projects.

**Algorithms:** The model uses various Machine Learning algorithms to train the model and generate the scores of each users' profile according to the choices they select. The algorithms used here are:

1) React is used for creating .js and .json project which provides the interface for our chatbot.

- 2) Neural Networks algorithms such as convolutional neural networks is used for the classification of like skilled users together based on their scores.
- 3) Luis.ai is used to train the model and build a score based on the choices entered by the user when asked the questions through the chatbot.

These algorithms form the basic structure of the chatbot. The detailed model can be analyzed through the following details.

This system is divided into various phases.

- 1) Registration Phase: The user has to register first giving the basic details as name, email id, and a password which will create an account for the user so that the user can add his/her interests and updated team details to the database making the chatbot analyze the user's needs precisely. These details are stored using Microsoft Azure Cloud database for further analysis.
- 2) Training Phase: involves a cloud based platform called Luis.ai with the help of which various classes are defined relating to the users' areas of interest. These areas each form an intent. The user gives the area of interest which is then tested against each entity and gets added to the most relevant intent. These intents get particular scores each based on the probabilistic algorithms and this score keeps increasing with each entry of the user data.

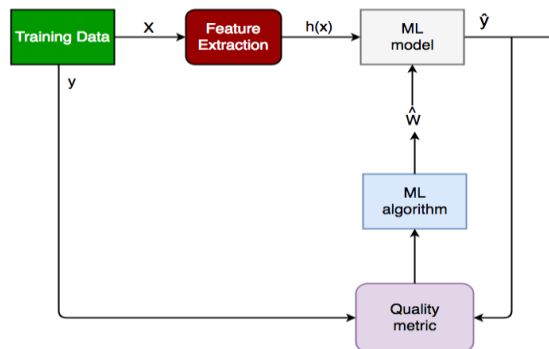


Figure 1.1

- 3) Connection Phase: Here we form a json file using the luis.py. Through that json file we can easily compare the profiles. Use the mean score obtained in this step for further processing.

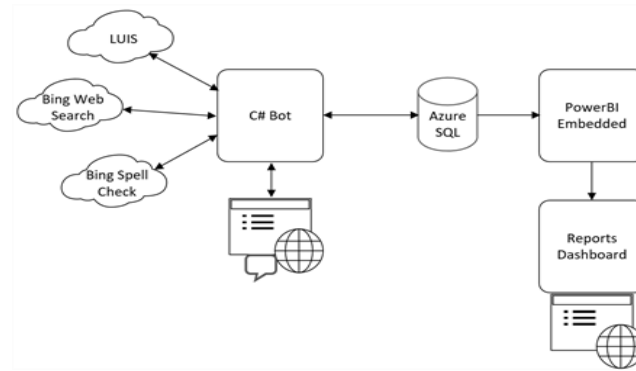


Figure 1.2

4) Interlinking Phase: Here in this step we create a main file called Backend.py. That will call Luis.py and compare\_profile.py using the data obtained it will form the team and save it to team.json.

5) Adding Web-pages: Once the user logs in there we will add a chatbot interface that will be developed in react. This chatbot will collect all the necessary data. After this the next page will show the matched team.

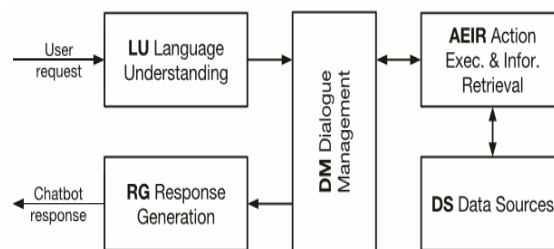


Figure 1.3

## IV. RESULTS AND INFERENCES

After thorough training of the model, it was found that the accuracy of the model increased with each epoch as the loss decreased gradually. The model works well on the test dataset as a new user inputs the information and this test data is trained against the model. The precision of the model gains a satisfactory level if the skills entered by the user are present with other users registered in the database.

The performance of the system can be analyzed on the criteria of percentage accuracy. Though the accuracy of the model tends to be approximately 92%, the accuracy can always be improved by adding new intents as skills to the database. Hence the overall implementation of the chatbot renders a good performance with considerable accuracy.

## V. CONCLUSION

The given paper gives a solution to students to carry out an easy project making process using a chatbot that analyses the specific areas of interests of a user and presents desired results in the form of related projects, similar skills and pre required knowledge about the project. The project help chatbot is a handy and easily available

tool that utilizes the concepts of Deep Learning, Artificial Intelligence and NLP to develop an algorithm for finding the perfect team mates and bring them together to help them carry of the project. It is a time saving and efficient way to make a student's life easy and to enhance the project team's capabilities.

## REFERENCES

1. Musto, C., Narducci, F., Lops, P., de Gemmis, M., & Semeraro, G. (2019). Linked open data-based explanations for transparent recommender systems. *International Journal of Human-Computer Studies*, 121, 93-107.
2. Piau, A., Crissey, R., Brechemier, D., Balardy, L., & Nourhashemi, F. (2019). A smartphone Chatbot application to optimize monitoring of older patients with cancer. *International journal of medical informatics*, 128, 18-23.
3. Liao, Q. V., Hussain, M. U., Chandar, P., Davis, M., Khazaeni, Y., Crasso, M. P., ... & Geyer, W. (2018, April). All Work and No Play?. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (p. 3). ACM.
4. Kucherbaev, P., Bozzon, A., & Houben, G. J. (2018). Human-Aided Bots. *IEEE Internet Computing*, 22(6), 36-43.
5. Argal, A., Gupta, S., Modi, A., Pandey, P., Shim, S., & Choo, C. (2018, January). Intelligent travel chatbot for predictive recommendation in echo platform. In *2018 IEEE 8th Annual Computing and Communication Workshop and Conference (CCWC)* (pp. 176-183). IEEE.
6. Lalwani, T., Bhalotia, S., Pal, A., Bisen, S., & Rathod, V. (2018). Implementation of a Chatbot System using AI and NLP. *International Journal of Innovative Research in Computer Science & Technology (IJIRCST)*.
7. du Preez, S. J., Lall, M., & Sinha, S. (2009, May). An intelligent web-based voice chat bot. In *IEEE EUROCON 2009* (pp. 386-391). IEEE.
8. Tvardik, N., Kergourlay, I., Bittar, A., Segond, F., Darmoni, S., & Metzger, M. H. (2018). Accuracy of using natural language processing methods for identifying healthcare-associated infections. *International journal of medical informatics*, 117, 96-102.
9. Le, N. T., & Wartschinski, L. (2018). A Cognitive Assistant for improving human reasoning skills. *International Journal of Human-Computer Studies*, 117, 45-54.
10. Abdul-Kader, S. A., & Woods, J. C. (2015). Survey on chatbot design techniques in speech conversation systems. *International Journal of Advanced Computer Science and Applications*, 6(7).
11. Lokman, A. S., Zain, J. M., Komputer, F. S., & Perisian, K. (2009, October). Designing a Chatbot for diabetic patients. In *International Conference on Software Engineering & Computer Systems (ICSECS'09)* (pp. 19-21).
12. Cavedon, L., Kroos, C., Herath, D., Burnham, D., Bishop, L., Leung, Y., & Stevens, C. J. (2015). "C 'Mon dude!": Users adapt their behaviour to a robotic agent with an attention model. *International Journal of Human-Computer Studies*, 80, 14-23.
13. Rossen, B., & Lok, B. (2012). A crowdsourcing method to develop virtual human conversational agents. *International Journal of Human-Computer Studies*, 70(4), 301-319.
14. Lokman, A. S., & Zain, J. M. (2010). Extension and prerequisite: An algorithm to enable relations between responses in chatbot technology. *Journal of Computer Science*, 6(10), 1212.
15. Bonarini, A., Matteucci, M., & Restelli, M. (2006). Concepts and fuzzy models for behavior-based robotics. *International Journal of Approximate Reasoning*, 41(2), 110-127.
16. Nuruzzaman, M., & Hussain, O. K. (2018, October). A Survey on Chatbot Implementation in Customer Service Industry through Deep Neural Networks. In *2018 IEEE 15th International Conference on e-Business Engineering (ICEBE)* (pp. 54-61). IEEE.
17. Serban, I. V., Sankar, C., Germain, M., Zhang, S., Lin, Z., Subramanian, S., ... & Rajeshwar, S. (2017). A deep reinforcement learning chatbot. *arXiv preprint arXiv:1709.02349*.
18. Ihedioha, Thelma Ebele, Rita Ifeoma Odo, Uwakwe Simon Onoja, Chikaodili Adaobi Nwagu, John Ikechukwu Ihedioha, and . "Hepatoprotective properties of methanol leaf extract of *Pterocarpus mildbraedii* Harms on carbon tetrachloride- induced hepatotoxicity in albino rats (*Rattus norvegicus*)." *Journal of Complementary Medicine Research* 10 (2019), 162-169. doi:10.5455/jcmr.20190716093120
19. Prasad, D.S., Kabir, Z., Dash, A.L., Das, B.C. Prevalence and risk factors for metabolic syndrome in Asian Indians: A community study from urban Eastern India(2012) *Journal of Cardiovascular Disease Research*, 3 (3), pp. 204-211. DOI: 10.4103/0975-3583.98895