International Journal of Engineering and Advanced Technology (IJEAT)
ISSN: 2249-8958 (Online), Volume-7 Issue-5, June 2018

New Bot Technologies Need To Automated or Augmented by Artificial Intelligence

Awanit Kumar, Abdul Hamid Qureshi

Abstract: ***Chatbot's are Natural language processing system based artificial intelligence systems that we interact with via text or voice interface like Apple siri or Google voice. World are now considering how best to apply new Bot technologies to their business to provide customers services, and their way to think about which types of work can be automated or augmented by Artificial Intelligence solutions for such problems. In this paper we are going to design a Chatbot for companies which can reduce human efforts (person who communicate customer by chatting other than voice process). Chatbot, are a hot topic and many companies are hoping to develop bots to have natural conversations indistinguishable from human ones, and many are claiming to be using .Natural language processing and Deep Learning techniques are used to make this possible.***

Index Terms: Chatbot, Artificial Intelligence, Natural Language Processing, Machine Learning, Deep Learning.

I. INTRODUCTION

A Chatbot is an intelligent system. With which a User's can interact in conversation mode through written or spoken text like apple siri or Google voice. Chatbot's are one such means of technology which helps humans by helping them increase sales whilst providing great customer satisfaction and retention. Applying AI Chatbot technology makes day to day activities easier and involves fewer efforts as algorithms implementation and makes easier for machines to chats and delivers responses user accordingly.

II. GOALS OF CHATBOT

Chatbot can live in messaging platforms like WhatsApp, Facebook Messenger and serve many purposes ordering online products [1]. To produce sensible responses systems may need to incorporate both linguistic context and physical context.

Along with the image problems, the text understanding is one of the top tasks in machine learning nowadays. So it was interesting to seriously tackle one more interesting and unsolved problem.

Even machine learning power-houses like Apple, Amazon, and Google often fail miserably with their conversational interfaces as shown in the figure below [2].

Figure 1: Apple SIRI, Common Type of Fail [2].

The reason of sometime failure of such application is not proper training with data or word in dictionary or machine didn't understand human language. we can't build a chat bot to discuss the meaning of life, or a bot to help with some complex human life problems.

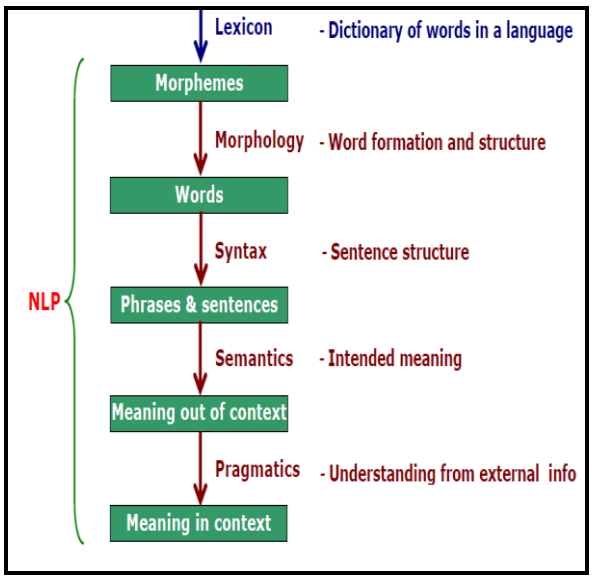

Figure 2: NLP Steps.

Manuscript published on 30 June 2018.
* Correspondence Author (s)
Awanit Kumar*, Assistant Professor, Department of Computer Science and Engineering, Modern Institute of Technology and Research Centre (MITRC) Alwar (Rajasthan) - 301001, India. Mobile: +91-89556-02345, E-mail: itsawanitkumar@gamil.com
Abdul Hamid Qureshi, Research Scholar, Department of Computer Science, Madhav University, Pindwara (Rajasthan)-307026, India. E-mail: hamidsojat@yahoo.com

A natural language engine understands and recognizes the written text and audio as same as the way humans do, but it manipulates the text in sophisticated ways, like automatically identifying words from the dataset and identifies the main topic from the dataset and extracting and tabulating the terms and conditions in a stack of human-readable contracts. Natural language processing technique focuses on human language and natural language generation on creating natural language outputs [4].

III. TRAINING CHATBOT

Training or designing a Chatbot much faster and larger scale than a human can teach a human. In comparison to Humans Customer Service Representatives (BPO's People), they are given a manual and have them read it and understand. While the AI Chatbot is fed with thousands of conversation logs and from those logs, the Chatbot is able to understand what type of question requires what type of answers [5].

IV. DESIGNING A CHATBOT

Text input is processed by a natural language word dictionary and then it passes through a function called a classifier", this classification associates an input sentence with an "intent" (a conversational intent) which produces a response [6].

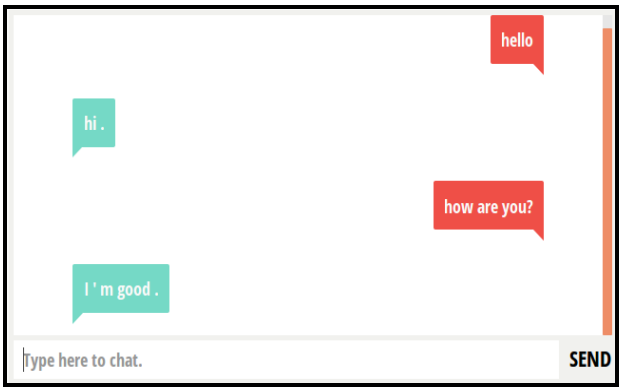

Figure 3: Chatbot Messenger Example [6].

V. ALGORITHM

For each unique input a pattern must be available to specify a response. This creates a hierarchical structure of patterns, the inspiration for the idiom.

To reduce the classifier to a more manageable machine, we can approach the work *algorithmically*, that is to say: we can build an equation for it. This is what computer scientists call a "reductionist" approach: the problem is *reduced* so that the solution is simplified [7].

A classic text classification algorithm is called "Multinomial Naive Bayes", taught in courses at Stanford and elsewhere. Here is the equation:

$$\hat{P}(t|c) = \frac{T_{ct}+1}{\sum_{t' \in V}(T_{ct'}+1)} = \frac{T_{ct}+1}{(\sum_{t' \in V} T_{ct'}) + B'}$$

Figure 4: Multinomial Naive Bayes [7].

This is a lot less complicated than it appears. Given a set of sentences, each belonging to a class, and a new input sentence, we can count the occurrence of each word in each class, account for its commonality and assign each class a *score*. Factoring for commonality is important: matching the word "it" is considerably less meaningful than a match for the word "cheese". The class with the highest score is the one most likely to belong to the input sentence [7],[8]. This is a slight oversimplification as words need to be reduced to their stems, but you get the basic idea.

A sample training set:
class: weather
"is it nice outside?"
"how is it outside?"
"is the weather nice?"
class: greeting
"how are you?"
"hello there"
"how is it going?"
Let's classify a few sample input sentences:
input: "Hi there"
term: "hi" **(no matches)**
term: "there" **(class: greeting)**
classification: **greeting** (score=1)
input: "What's it like outside?"
term: "it" **(class: weather (2), greeting)**
term: "outside **(class: weather (2))**
classification: **weather** (score=4)

Notice that the classification for "What's it like outside" found a term in another class but the term similarities to the desired class produced a higher score. By using an equation we are looking for word matches given some sample sentences for each class, and we avoid having to identify every pattern [7][9][10].

The classification score produced identifies the class with the highest term matches (accounting for commonality of words) but this has limitations. A score is not the same as a probability, a score tells us which intent is most like the sentence but not the likelihood of it being a match. Thus it is difficult to apply a threshold for which classification scores to accept or not. Having the highest score from this type of algorithm only provides a relative basis, it may still be an inherently weak classification. Also the algorithm doesn't account for what a sentence is not, it only counts what it *is* like. Many Chatbot frameworks use algorithms such as this to classify intent. Most of what's taking place is word counting against training datasets, it's "naive" but surprisingly effective.

VI. CONCLUSION

Finally, we are ready to create the most powerful and intelligent conversational model. Despite a lot of work in this area, neural dialogue systems are not ready to talk with humans in open-domain and provide them with informative/funny/helpful answers. But as for closed-domain (technical support or Q&A systems, for example) there are success stories.

Published By:
Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP)

REFERENCES

1. https://chatbotslife.com/ultimate-guide-to-leveraging-nlp-machine-learning-for-you-chatbot-531ff2dd870c
2. https://towardsdatascience.com/chatbots-vs-reality-how-to-build-an-efficient-chatbot-with-wise-usage-of-nlp-77f41949bf08
3. https://chatbotsmagazine.com/contextual-chat-bots-with-tensorflow-4391749d0077
4. https://www2.deloitte.com/insights/us/en/focus/tech-trends/2017/moving-beyond-artificial-intelligence.html
5. https://chatbotsmagazine.com/what-is-the-working-of-a-chatbot-e99e6996f51c
6. https://medium.com/@gk_/how-chat-bots-work-dfff656a35e2
7. https://blog.statsbot.co/chatbots-machine-learning-e83698b1a91e
8. https://blog.statsbot.co/text-classifier-algorithms-in-machine-learning-acc115293278
9. https://github.com/facebookresearch/InferSent
10. https://github.com/facebookresearch/fastText

AUTHOR PROFILE

Awanit Kumar, is currently working as Assistant Professor at MITRC (Modern institute of engineering and technology), Alwar Rajasthan India. And pursuing his Ph.D. from Madhav University, Abu Road, Rajasthan. India.

Abdul Hamid Qureshi is working as H.O.D in department of computer science at international school of Jeddah, Saudi Arab. And currently he's pursuing his Ph.D. in computer science from Madhav University, Abu Road, Rajasthan. India.