



MAMABOT: A SYSTEM BASED ON ML AND NLP FOR SUPPORTING WOMEN AND FAMILIES DURING PREGNANCY

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ABSTRACT:

Artificial intelligence is transforming healthcare with a profound paradigm shift impacting diagnostic techniques, drug discovery, health analytics, interventions and much more. In this paper we focus on exploiting AI-based Pregbot systems, mainly based on machine learning algorithms and Natural Language Processing, to understand and respond to needs of patients and their families. In particular, we describe an application scenario for an AI-Pregbot delivering support to pregnant women, mothers, and families with young children, by giving them help and instructions in relevant situations.

Keywords: *AI, pregbot, Drug, diagnostic.*

INTRODUCTION

Introduction This work gives a general introduction to Pregbots by explaining what they are, what they can be used for and how to develop them. No previous domain-specific knowledge is required.

Lately as of writing topics around Pregbots have received increasing attention from media and also numerous investments from different actors in the industry. At the same time not many potential users know about the existence of Pregbots or about areas in which Pregbots could be helpful assistance. The topic is equally unknown to developers.

While the term Pregbot is commonly used in media, the meaning mostly remains ambiguous. There is a need for further explanation of what Pregbots are and further analysis to identify well suited applications for

Pregbots. Additionally to spreading knowledge about the potentials of Pregbots and their use cases, more developers should be enabled to create new, innovative Pregbots.

The lack of knowledge can be solved by providing answers to the questions of what Pregbots are, what benefits they bring and how to create them. An appropriate definition of Pregbots can be given by analyzing the fundamental meaning of the term Pregbot and by exploring past and current applications. Use cases of Pregbots can be identified in existing products. Market trends and attributes of media and technology can be analyzed to find new potential scenarios for the usage of Pregbots. Development is best explained by creating a real Pregbot and by using it to present the general principles of the development process.



Explaining what Pregbots are, demystifying what to use them for and presenting how to create them, will help more people to be able to use and create Pregbots, and thereby, accelerate the development of the Pregbot ecosystem. Innovation in technology and the creation of new solutions can help automating and simplifying more tasks, which gives people the opportunity 1 to focus on more interesting issues and accomplish more things. Pregbots have the potential to simplify and automate many existing tasks and thereby accelerate the overall technological progress.

The structure of this work follows the three main questions. To begin with, terminology is defined and applications are explored to form a definition and understanding of what Pregbots are. Afterwards use cases of Pregbots are identified not only through the collection of existing examples, but also through the exploration of future potentials by analyzing attributes of the relevant technologies.

The second half of the work is a case study for the development of a Pregbot. The presented example guides through the process of designing user interactions for a Pregbot, and additionally explains architectural decisions and technological choices, which provide a basis for other developers to build on when creating new Pregbots in the future.

LITERATURE SURVEY

TITLE 1: A Pregbot for Perinatal Women's and Partners' Obstetric and Mental Health Care: Development and Usability Evaluation Study

**AUTHOR: Kyungmi Chung ,
Orcid Image ; Hee Young Cho
Orcid Image ; Jin Young Park ,
Orcid Image**

The objectives of this study are to develop and evaluate a user-friendly question-and-answer (Q&A) knowledge database-based Pregbot (Dr. Joy) for perinatal women's and their partners' obstetric and mental health care by applying a text-mining technique and implementing contextual usability testing (UT), respectively, thus determining whether this medical Pregbot built on mobile instant messenger (KakaoTalk) can provide its male and female users with good user experience. Methods: Two men aged 38 and 40 years and 13 women aged 27 to 43 years in pregnancy preparation or different pregnancy stages were enrolled. All participants completed the 7-day-long UT, during which they were given the daily tasks of asking Dr. Joy at least 3 questions at any time and place and then giving the Pregbot either positive or negative feedback with emoji, using at least one feature of the Pregbot, and finally, sending a facilitator all screenshots for the history of the day's use via KakaoTalk before midnight. One day after the UT completion, all participants were asked to fill out a questionnaire on the evaluation of usability, perceived benefits and risks, intention to seek and



share health information on the Pregbot, and strengths and weaknesses of its use, as well as demographic characteristics.

TITLE 2: Artificial Intelligence in Pregnancy: A Scoping Review

AUTHOR M. C. Romero-Ternero ;Andreea Madalina Oprescu ;Gloria Miró Amarante

Artificial Intelligence has been widely applied to a majority of research areas, including health and medicine. Certain complications or disorders that can appear during pregnancy can endanger the life of both mother and fetus. There is enough scientific literature to support the idea that emotional aspects can be a relevant risk factor in pregnancy (such as anxiety, stress or depression, for instance). This paper presents a scoping review of the scientific literature from the past 12 years (2008-2020) to identify which methodologies, techniques, algorithms and frameworks are used in Artificial Intelligence and Affective Computing for pregnancy health and well-being. The methodology proposed by Arksey and O'Malley, in conjunction with PRISMA-ScR framework has been used to create this review. Despite the relevance that emotional status can have as a risk factor during pregnancy, one of the main findings of this study is that there is still not a significant amount of literature on automatic analysis of emotion. Health enhancement and well-being for pregnant women can be achieved with artificial intelligence or affective computing based devices,

hence future work on this topic is strongly suggested.

TITLE 3: A Comparative Study of Medical Pregbots

AUTHOR: Jitendra Chaudhary, Vaibhav Joshi, Atharv Khare, Rahul Gawali, Asmita Manna

In this era of digitization, Pregbots are slowly becoming the first point of contact for customers with almost all business organizations, especially for real estate sector, education sector and medical sector. Pregbots in the medical sector are expected to replace the human operators for appointment set up, patient management, sending reminders and perform the operation of a medical assistant. However, the available medical Pregbots are not yet able to perform all the duties of a compounder. In this paper, a comparison of various available medical Pregbots along with their pros and cons is presented. A multilingual Pregbot called 'HEALTHBOT' is also proposed. This Pregbot will interact with patients in English and Marathi, will note down their symptoms and pathological test reports, prescribe the patients with further medical tests and suggest them basic medications, diets, and lifestyle changes. The prescriptions produced by the Pregbot will be checked by the respective medical practitioner for further investigation. In short, this HEALTHBOT would be highly useful for the medical practitioners as



personal assistant and not only that it would save valuable time for both the parties and reduce the medical treatment gap.

EXISTING SYSTEM

Pregbots receive increasing attention from media and industry, but at the same time it is not yet well known what Pregbots really are, what they can be used for and how to create them. The goal of this work is to answer these three questions by analyzing existing platforms, products and technologies, and additionally developing an exemplary Pregbot. Explaining what Pregbots are, demystifying what to use them for and showing how to create them will help more people to be able to use and create Pregbots and thereby accelerate the development of the Pregbot ecosystem. Starting by defining fundamental terms, the first half of the work focuses on showing available platforms, products and technologies, while the second half guides through the development of an exemplary Pregbot, including user interaction design and software architecture.

PROPOSED SYSTEM

This is an automated chat robot design to answer users frequently asked questions, earlier natural language processing techniques were using to design this robots but its accuracy of giving correct answer was less and now due to Deep Learning algorithms accuracy of giving correct answer increase, so here using python deep learning project we are building

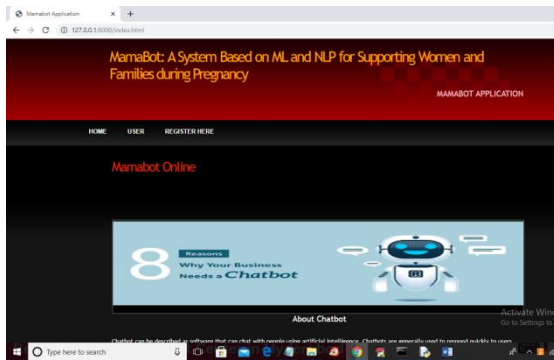
PREGBOT application to answer users questions.

To implement this technique first we train deep learning models with the train data (all possible question's answers) and whenever users give any question then application will apply this test question on train model to predict exact answer for given question.

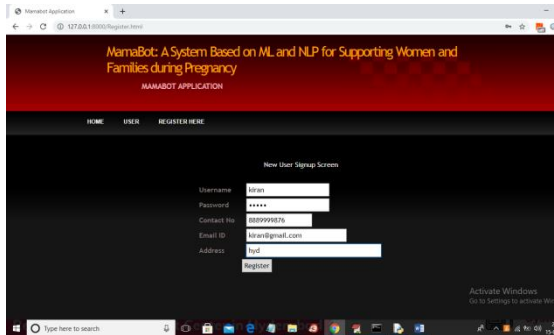
Earlier companies were hiring humans to answer user's queries but by using this application we can answer user's question without using any man power. Chabot can be described as software that can chat with people using artificial intelligence. Chabot's are generally used to respond quickly to users. Chabot's, a common name for automated conversational interfaces, present a new way for individuals to interact with computer systems. Traditionally, to get a question answered by a software program involves using a search engine, or filling out a form. A Chabot allows a user to simply ask questions in the same manner that they would address a human. There are many well-known voice-based chatbots currently available in the market: Google Assistant, Alexa and Siri. Chabot's are currently being adopted at a high rate on computer chat platforms.

To implement this project we are using python deep learning neural networks and NLTK (natural Language Processing API) to process train and test text data.

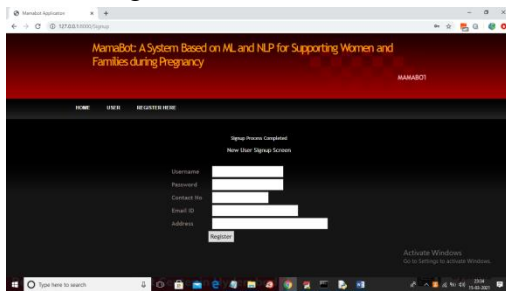
METHODOLOGY



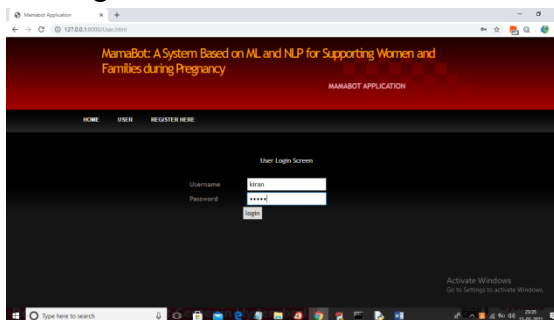
In above screen click on 'Register Here' link to get below signup page



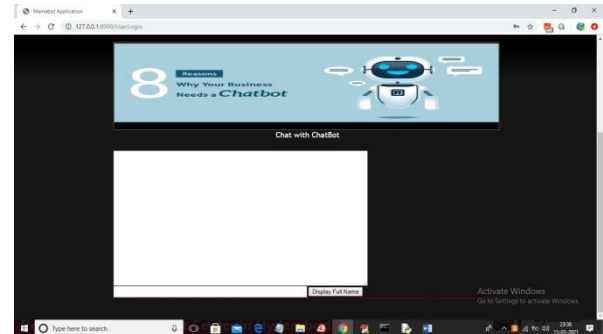
In above screen user can enter some signup details and then press 'Register' button to get below screen



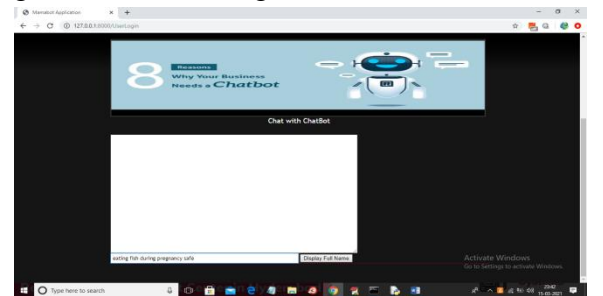
In above screen user signup process completed and now user can login by clicking on 'User' link



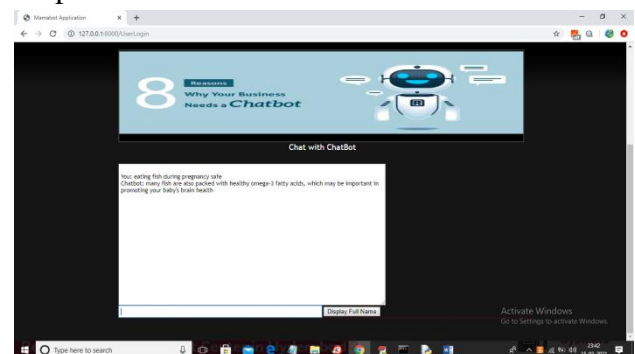
In above screen user is login and after successful login will get below page



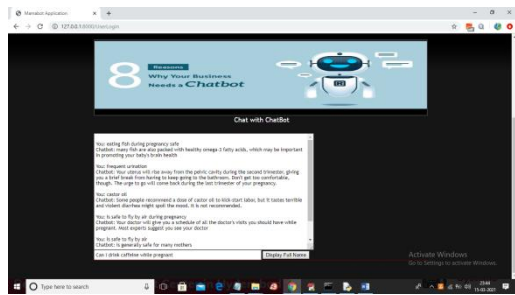
In above screen user can enter any query and then click on 'Display Full Name' button to get answer from MAMABOT and if question not available in MAMABOT train model then user will get SORRY message



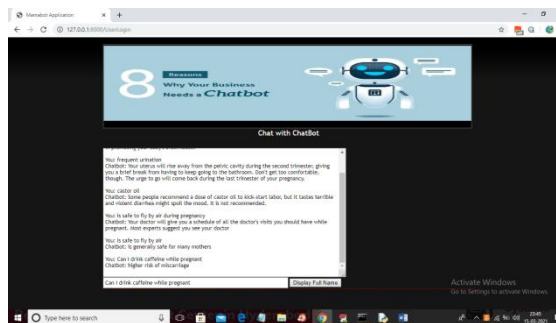
In above screen user type some question and then press button to get below output



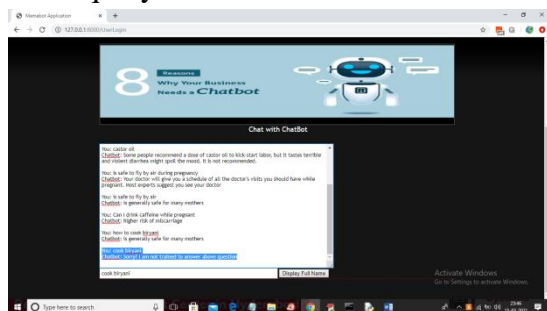
In above screen we got some answer from MAMABOT and try some other questions as



In above screen I ask some question and MAMABOT answer it well



You can ask all questions available in dataset/question.json file and now give some query out of train model



In above screen I ask question as ‘cook biryani’ and bot answer as SORRY

CONCLUSION

Pregbots can offer a lot of benefits in the mHealth domain both for healthcare providers and patients without having to download and install an app. All they have to do is chat with the bot to get relevant answers to their queries. Pregbots cannot replace humans but they can provide an interesting channel to support patients in delivering useful information and services through a simple conversation delivering

personalized care while cutting down wait time. If well-designed and implemented, Pregbots can increase users’ engagement and self-empowerment, by providing a better experience and save costs for the healthcare system (by reducing the number of unnecessary consultations). There are still several challenges in using Pregbots (e.g. conversations generally cannot be very complex and require increasing resources when expanding the Pregbot domain focus). Moreover, synonyms, hypernyms and hyponyms which are NLP and ontology challenges are among the complex limitations that most Pregbots suffer today. Other challenges are related to the privacy and security of the data collected. Pregbots indeed have to adhere to regulatory rules to avoid the exposure of patient information. In this paper we have presented an AI-based Pregbot useful to support and help pregnant women, mothers and families with young children about any doubts or problems that may incur during the pregnancy/childhood. The prototype needs further testing under real conditions, but its current status suggests that deployment will be straightforward. In general, we have found that as the intents grow, the use of similar words in different contexts can lead to a 7% reduction in the accuracy of the system in identifying the specific intent.

5.2 FUTURE ENHANCEMENT:

In the future, we will perform a quantitative evaluation of such effect.



Moreover, we plan to widen and improve this research by: extending the number of intents for testing and training purposes; enriching the medical knowledge by means of specialized medical staff providing official and authoritative information; adopting more advanced techniques to deal with the context change; performing a test on the field on real patients.

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