Software Application for Intelligent Dialog Systems Maintenance

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Abstract – In this paper we consider the problem of functioning and adjustment of chatbots – systems which use artificial intelligence for human speech simulating and processing. We propose a structural scheme and algorithm of the chatbots' maintenance system.

Keywords – artificial intelligence, natural language processing, chatbots, dialog systems, software.

Introduction

Research in the field of artificial intelligence (AI) involves solution of problems such as automated software development, information retrieval, automated translation, document generation, organization of a natural dialogue between human users and computers.

AI has gained widespread use in chatbots [1], systems used in NLP (natural language processing), i.e. processing and imitation of human speech. Today the number of chatbots is growing exponentially, in particular, the number of chatbots on the *Facebook Messenger* platform has reached 300,000. There are other popular instant messenger platforms, e.g. *Slack.*

Chatbots are used in various fields, such as healthcare, digital economics, law, real estate, customer care and others. Depending on the industry, each chatbot will have a functionality aimed at meeting the needs of this industry. From the list of use areas, we can conclude that the incorrect operation of a chatbot can cause negative and even disastrous consequences. Thus, the question of ensuring the correct operation of chatbots is one of the most important in the process of their creation, configuration and use.

Formulation of the problem

We aim to develop a software system for maintenance of chatbots, created using the Dialogflow service [2]. We will suggest methods for chatbots checking, configuring and training as well as the structural scheme and algorithm of the system.

Proposed solution

To solve the problem we developed a structural scheme (Fig.1) and an appropriate algorithm (Fig. 2). The algorithm provides an opportunity to check the *Agent*, a system of understanding the natural language, focused on processing a specific set of user queries, according to three criteria.

The first one is to check for repetition of *User Says* (user queries) in different *Intents* (intentions-queries). The second one is checking for empty *Intents*. Third: duplication check of *User Says* within one *Intent*. Also, this algorithm allows correcting found errors in the *Agent*.

The algorithm of the chatbot maintenance system consists of the following main steps:

- connecting the *AI Agent* to our system (this agent is an autonomous AI element which is guided by certain intentions and accordingly responds to a change in their state);
- downloading the data, fetching data from the database;
- checking for empty *Intents*;
- checking for repetition of *User Says*;
- checking the correct *Intents* settings (duplication check of *User Says* in different *Intents*).

When creating the maintenance system, the object-oriented Java programming language was selected. We chosed MySQL RDBMS for storing the data on *Intents* and *User Says*.

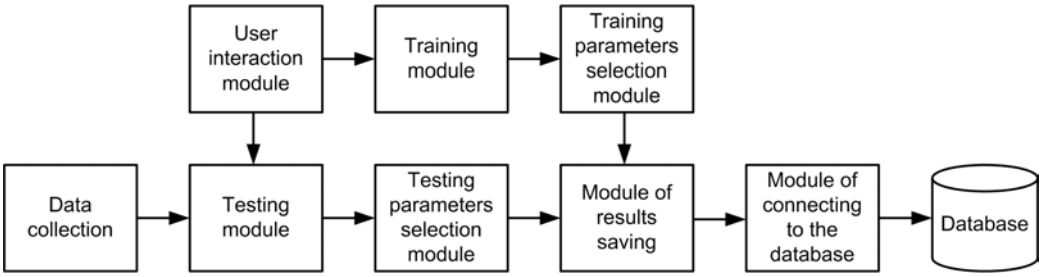

Fig.1. Structural scheme of the maintenance system.

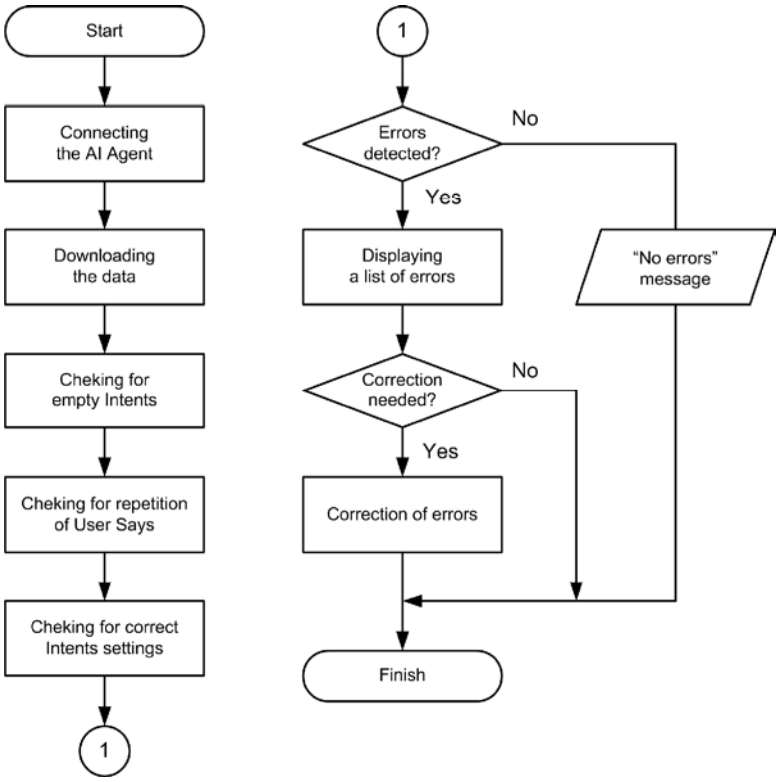

Fig. 2. Structural scheme of the maintenance system.

Conclusions

The paper proposes a way to solve an important task – ensuring the correct functioning of chatbots – intellectual means of simulation and processing of human speech. A software maintenance system for chatbots checking and setting up has been developed. In the paper the structure of the system and the algorithm of its work are presented.

References

[1] J. Hill, W. R. Ford, I. G. Farreras. "Real conversations with artificial intelligence: A comparison between human–human online conversations and human-chatbot conversations." Computers in Human Behavior, vol. 49, pp. 245-250, 2015.

[2] Dialog Flow, Dialog Flow Agents Documentation. [Online] Available: https://dialogflow.com/docs/agents [Accessed: 15 Oct. 2018].