

The autonomous learning intelligent platform based on BOT FRAMEWORK

LAKSHMI SHREE MS

Final Year Mtech, Cambridge institution of technology Bangalore

Abstract—In this paper it proposes the method to establish the autonomous learning intelligent platform based on BOT FRAMEWORK, by researching and developing the intelligent chatting robot based on BOT FRAMEWORK and comprehensively utilizing the new generation of information technology such as cloud computing and mobile internet etc, to establish an autonomous learning intelligent platform supporting the voice chat, to effectively inspire student's interest on study and greatly improve their autonomous learning effect accordingly.

Keywords- VOT FRAMEWORK intelligent chatting robot autonomous learning intelligent platform

I. INTRODUCTION

Currently the intelligent chatting robot was used more and more widely, besides the basic function of intelligent reply, it also has the extensive functions such as online customer service, entertainment and education etc. The BOT FRAMEWORK released by Microsoft company did provide the simple and easy-to-use platform for developing the personalized intelligent chatting robot. By utilizing such platform and combining the technologies of cloud computing and mobile internet, it can establish an autonomous learning platform. With such platform, it may effectively inspire student's interest on study and greatly improve their autonomous learning effect accordingly.

II. THE COMPOSITION AND STRUCTURE OF THE AUTONOMOUS LEARNING INTELLIGENT PLATFORM BASED ON BOT FRAMEWORK

The autonomous learning intelligent platform based on BOT FRAMEWORK consists of intelligent terminal, data acquisition module, intelligent robot and cloud platform, as per shown in figure 1.

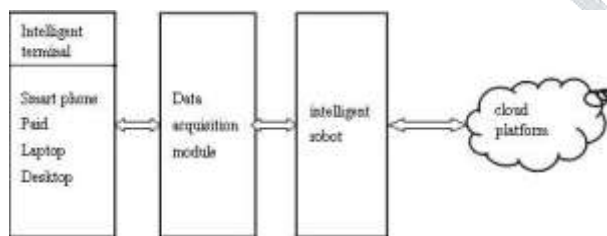


Figure 1. The composition and structure of the autonomous learning intelligent platform based on BOT FRAMEWORK

A. Intelligent terminal.

The so called intelligent terminal refers to those intelligent device with the function to process the audio, picture and text etc, such as smart phone, Paid, laptop and desktop etc, the user could interact with the intelligent chatting robot through intelligent terminal.

B. Data acquisition module

The data acquisition module can make the de-noising process on the collected information, to gain the effective input of information. The data acquisition module shall be the interface and bridge for the communication between the intelligent terminal and intelligent robot.

C. Intelligent robot

The intelligent chatting robot based on BOT FRAMEWORK can support several human-computer interaction modes in text, voice and picture etc, it shall be the core module of the system. By using such robot in the autonomous learning intelligent platform of the advanced vocational school, it can provide the convenience for the student with online questioning, communication and collaboration, searching the resources outside and inside the website, to realize the effective autonomous learning accordingly. The intelligent chatting robot can answer the student's questions in various styles, including the text input, microphone input, recorded audio file and picture etc. For simple question, it can directly return the text and audio, the complex question can be solved through downloading relative resources from local database or cloud end, it also have the expandable autonomous learning model with human-computer interaction.

D. Cloud platform

The cloud platform provides the service based on the "cloud", to supply the intelligent robot with the needed resources. Cloud computing is a type of Internet-based computing that provides shared computer processing resources and data to computers and other devices on demand. It is a model for enabling ubiquitous, on-demand access to a shared pool of configurable computing resources (e.g., computer networks, servers, storage, applications and services), which can be rapidly provisioned and released with minimal management effort. Cloud computing and storage solutions provide users and enterprises with various capabilities to store and process their data in third-party data centers that may be located far from the user—ranging in distance from across a city to across the world. Cloud computing relies on sharing of resources to achieve

coherence and economy of scale, similar to a utility (like the electricity grid) over an electricity network.

III. KEY TECHNOLOGIES

A. Supporting the data acquisition technology under the noisy environment.

In order to assure the recognition ability of intelligent robot, it may need the de-noising process on the inputted information, that is the data acquisition function under the noisy environment. Such technology firstly has the function of pattern recognition, it should recognize whether the input information was the text, voice or picture, then to treat these information with de-noising process, enable them meeting the recognition requirement of intelligent robot.

B. speech recognition technology

The speech recognition technology refers to such high technology that enable the robot converting the speech signal into corresponding text or command through recognition and understanding process. The speech recognition technology mainly contain the two aspects of natural language understanding and natural language formation.

1) natural language understanding

The target of natural language understanding shall be to generate such kind of semantic representation form for the chatting task. Generally the function of natural language understanding function inside the chatting robot system shall include the technologies of user intention recognition, user emotion recognition, anaphora resolution, ellipsis recovering, reply confirmation and reject judgments etc.

2) natural language formation

The natural language formation usually generate the user-oriented natural language feedback autonomously according to the non-language information generated from the dialogue management part. In recent years, the dialogue generation on the chatting robot system mainly involve two kinds of technologies in search strategy and formation strategy.

C. cloud platform

The cloud platform shall be based on cloud computation. Such platform shall put the developed application and service into the "cloud" for operation and provide the service accordingly; or use the service provided from the "cloud", including the Software-as-a-Service - SaaS, Platform-as-a-Service - PaaS and Infrastructure-as-a-Service - IaaS.

1) Platform as a service (PaaS)

PaaS vendors offer a development environment to application developers. The provider typically develops toolkit and standards for development and channels for distribution and payment. In the PaaS models, cloud providers deliver a computing platform, typically including operating system, programming-language execution environment, database, and web server. Application developers can develop and run their software solutions on a cloud platform without the cost and complexity of buying and managing the underlying hardware and software layers. With some PaaS offers like Microsoft Azure and Google

App Engine, the underlying computer and storage resources scale automatically to match application demand so that the cloud user does not have to allocate resources manually. The latter has also been proposed by an architecture aiming to facilitate real-time in cloud environments.

2) Software as a service (SaaS)

In the software as a service (SaaS) model, users gain access to application software and databases. Cloud providers manage the infrastructure and platforms that run the applications. SaaS is sometimes referred to as "on-demand software" and is usually priced on a pay-per-use basis or using a subscription fee. In the SaaS model, cloud providers install and operate application software in the cloud and cloud users access the software from cloud clients. Cloud users do not manage the cloud infrastructure and platform where the application runs. This eliminates the need to install and run the application on the cloud user's own computers, which simplifies maintenance and support. Cloud applications differ from other applications in their scalability—which can be achieved by cloning tasks onto multiple virtual machines at run-time to meet changing work demand.

3) Infrastructure as a service (IaaS)

According to the Internet Engineering Task Force (IETF), the most basic cloud-service model is that of providers offering computing infrastructure – virtual machines and other resources – as a service to subscribers. Infrastructure as a service (IaaS) refers to online services that abstract the user from the details of infrastructure like physical computing resources, location, data partitioning, scaling, security, backup etc. A hypervisor, such as Xen, Oracle VirtualBox, Oracle VM, KVM, VMware ESX/ESXi, or Hyper-V, runs the virtual machines as guests. Pools of hypervisors within the cloud operational system can support large numbers of virtual machines and the ability to scale services up and down according to customers' varying requirements. Linux containers run in isolated partitions of a single Linux kernel running directly on the physical hardware. Linux cgroups and namespaces are the underlying Linux kernel technologies used to isolate, secure and manage the containers. Containerisation offers higher performance than virtualization, because there is no hypervisor overhead.

IV. THE DEVELOPMENT TREND OF INTELLIGENT CHATTING ROBOT

The intelligent chatting robot is such a program to simulate human dialogue through natural language. It usually operate on the specific software platform, such as the PC platform or the device platform at the mobile end, but the humanoid hardware mechanical body shall not be the necessary carrier device. The development trend of intelligent robot shall be:

A. The stronger and stronger ability in self-learning and self-upgrading.

The self-learning and self-upgrading should be the important indicator to represent the intelligence of the

chatting robot. After accomplishing the self-learning according to the designer's data structure and algorithm and possessing the knowledge screening ability to the certain degree, the self-upgrading ability shall become the next generation of robot with more intelligence.

B. Supporting voice chat

In comparison with text chat, the voice chat shall have the natural advantages in fast speed, quick response and convenience etc, now it has become the standard configuration for the intelligent chatting robot. Among the many announcements here at Microsoft's Build developer conference in San Francisco, the company spent a significant amount of time with a concept it called "conversation as platform," which it believes will introduce human language and machine intelligence as the next computing interface. Cortana lies at the heart of this expansive initiative, but it will require artificial intelligence and machine learning, and the use of bots that can appear in your everyday computing experiences, especially where your conversations happen.

C. Supporting daily affair treatment

Today the simplicity shall not fulfill the demand of people on the intelligent chatting robot, and people started to ask the intelligent chatting robot having more and more functions such as weather inquiry, agenda remind, traffic navigation, online translation etc. Currently these functions have been realized on many kinds of intelligent chatting robots.

D. The higher and higher personalized (customized) requirement

Along with the improvement on the requirement of intelligent chatting robot, to develop the intelligent chatting robot for fulfilling the user's personalized (customized) requirements has been set on the agenda increasingly. In March 2016, Microsoft specially released the BOT FRAMEWORK at the annual Build conference, it's the tool (platform) that exclusively designed for developing the intelligent robot. This tool can understand the natural language and analyze the picture etc, initially it released 22 API that can be integrated into the application. The user can utilize these API to develop the personalized intelligent chatting robot.

V. CONCLUSION

In order to better support the interactivity and real-time response ability of the autonomous learning platform, in this paper it proposes the establishing method of the autonomous learning intelligent platform based on BOT FRAMEWORK. Through researching and developing the intelligent chatting robot based on BOT FRAMEWORK and comprehensively utilizing the new generation of information technology such as cloud computing and mobile internet etc, to establish an autonomous learning intelligent platform supporting the voice chat. In comparison with text chat, voice chat, it has the characteristics of fast input speed, large information capacity, quick response and convenience etc, with the quite good interactivity and real-time response ability, and it can

better improve the learner's study interest and efficiency in the autonomous learning intelligent platform accordingly.

ACKNOWLEDGEMENTS

This paper was financially supported by the fund :2017 Henan science and technology research plan .

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