Casey Patrick Jacky

Slide 1: Jacky Casey Patrick

Good morning. I am Jacky, Patrick, Casey. Today, we are going to present our fyp project blueprint. Before entering the main course to introduce our “product”, we would like to share some problems we have observed that bring us the idea of this “product”.

Slide 2: Casey

First of all, we have realized that students got diverse problems and questions about their school lives. However, they always ask the inappropriate individuals for answers. Take me as an example, I have asked a professor about the application of CEF. Turns out, the professor actually doesn’t know the answer to this question. In this scenario, we have discovered that inconvenience is brought to different stakeholders. Moreover, the absence of online support after office hour. Urgent inquiry from students cannot be handled.

Slide 3: Patrick

As an Engineering student, seeing these situations. We would like to solve the real-life problems with our knowledge. Thus, our goal to successfully provide a solution to the institution and students through software application.

Slide 4: Casey

There are two major objectives that our “product” can achieve. First, provide a 24/7 online platform for student’s inquiry. Second, provide valid and meaningful information back to students. With the application of our “product”, the frequency that students need to ask a real person and the rate of asking the inappropriate individuals are reduced. Hence, the current inquiry issues can be improved. Our “product” can reduce teachers and staffs’ unnecessary workload.

Slide 5: Casey

Now, we would like to introduce our state-of-the-art “product”: Spacebot.

Slide 6: Jacky

So what is Spacebot? It is an AI chatbot. It simulates conversations with a user in natural language through messaging applications. Indeed, the mechanism behind is a Question Answering system leveraging Natural Language Processing (NLP). In addition, it is a platform to provide real-time interaction for HKUSPACE students.

Slide 7: Jacky

Our Spacebot aims to cover the following areas. We hope to implement a chatbot that can perform interaction with student and provide valid and useful response regarding “School facilities and services”, “Non-jupas application”, “Scholarship and financial support”, “Online platform issues”, and also “School administration affairs”. According to the response data, this scope may further extend.

Slide 8: Patrick

As a chatbot, how can a machine understand the questions from a human? Natural Language Processing (NLP) is the key. So, here comes the second question: What is NLP? Taking this question “What is the weather tdy” as an example. In general, a machine cannot identify questions, sentences and even the meaning of the words from human.

Slide 9: Patrick

To let a machine understands this question. Specific keywords, grammar, syntax, sentence structures and patterns are created by human, all these elements are combined in sections to form a sentence. Thus, a database of sentences is created. The role of the machine is to match the sentence structures of the users’ input. Matching the question example with the database, the machine divides this sentence structure into three sections. First, the machine recognizes this is a question through the “wh” keywords. Then, the keyword “the weather” implies the information user asking for. At last, “today” is the keyword to represent the time of information.

Slide 10: Patrick

Indeed, it is believed that there can be numerous and various sentence structures and natural language data in terms of processing and analyzing.

Slide 11: Patrick

In short, NLP categorize the messages through identifying the keywords in the sentence and categorizing into different sentence structures. Through processing and analyzing, the chatbot is able to perform interaction with users. If sufficient conditions meet, the chatbot can further provide appropriate and valid response. Else, the chatbot may ask for extra information from the user for clarification.

Slide 12: Casey

How do we implement this project? We utilize Python, Pipenv, Ngrok, Olami and Telegram.

Slide 13: Casey

We have picked Python as our development language because it contains machine learning algorithms in the library. More importantly, our group members are familiar with this language. Besides, we use Pipenv as a dependency manager for the Python projects.

Slide 14: Casey

Ngrok is used as a localhost webhook development tool for our testing purpose. Since we do not have a real server or cloud server at the moment. Also, we choose Olami as our AI software development tool to customize the NLP modules. As it is a decent GUI to implement grammar and create sentence syntax. In addition, there is also built-in open source module to handle Chinese syntax. Lastly, Telegram is chosen to deploy our Spacebot. With the aid of Botfather API (a chatbot manager provided by telegram), we don’t need to build a chatbot from scratch and no need to design the UI on our own.

Slide 15-16: Jacky

The details of our schedule are shown in the following two slides. In short to summarize, we have started the research and drafted a project plan in Sep. Then, we have implemented a test server and deployed a chatbot prototype in Oct. We are going to finish our first NLP module in Nov and begin the module testing. From Dec on to Mar, we aim to complete all the additional functions, NLP modules and ready for demonstration. Due to time limit, you may refer to these slides again after the presentation.

Slide 17-18: Jacky

The following two slides have shown our division of work. We aim to distribute the work evenly. Due to time limit, you may refer to these slides again after the presentation.

Slide 19: Casey

At the moment, we don’t need to purchase any resources. However, we may need to rent a real server or a cloud server such as Amazon cloud for chatbot deployment in the future.

Slide 20: Casey

Now, we would like to go through some problems that we encountered during testing, we found that the issues mainly came from Olami. There may be intermittent response from the Spacebot with respect to the complexity of the modules. As we cannot better Olami NLP server, we can only put our effort on generalizing the keywords into the same pattern to reduce sentence structures duplication in NLP database. Since there is no GUI to import our customized keywords to database for data validation, it is not so user friendly. But we are able to import them by sending programmable request to the NLP server.

Slide 21: Patrick

For the prospect of this project, we hope to take our traditional chatbot to the level of Machine Learning. We look forward to discovering some useful patterns through analysis of the collected data. In addition to train our chatbot through Machine Learning algorithms with this data to achieve AI.

Slide 22: “demo”

Now, we would like to do a short demo to show our progress. Please give us a sec to open the telegram.

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1. /start (will be handled in short)
2. Greeting (hi, hello, bye)
3. Tell me the contact of (KEC/Kowloon east campus/IEC/island east campus/fortress tower centre/ fortress tower center)
4. Where is (library/lib/libra/common room/”k”大com/”vm2”細com/com rm/study room/discussion room/computer lab)?
5. Which floor is (…)

\*\*\*Demo: long term & short term, various questions type/ sentence structure

Punctuations are considered as skipper in Olami and they are not considered in processing, therefore, users are not necessary to add a “?”. The chatbot recognize it’s a question from the “wh” keywords.

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So we have reached the telegram platform. First thing, we have to search our Spacebbot. Type the tag name “fypspacebot” and you can see our chatbot. Click the start button, and then we can start communicating with the bot. Now, you can see a response that the bot doesn’t understand what I mean. It is because of the “/start” input message. It is actually a bug as we haven’t implemented a module to handle this kind of preset protocol. This bot can perform appropriate greetings.

We would like to show our progress of the school facilities module. You may ask “tell me the contact of Kowloon east campus”. It provides valid and correct information in response. Not only does it recognize formal term wording, but it also recognizes short term. Like “tell me the contact of kec”. It also gives the appropriate response. Besides, we may also ask “where is the common room”. It also replies with correct information. In addition, this bot can also understand some Chinese wordings. Like “where is 大com”. It also understands. Or you can change the way to ask this question, “which floor is com rm”. It also knows.

We aim to make our Spacebot more AI. We are working on implementing more modules and more user friendly function like “user guideline panel” in short. And this is what our Spacebot is capable of at the moment. Our presentation ends here, thank you. If you have any questions, we would love to discuss.