

EMOTIVE EXPRESSIONS IN SOCIAL CHATBOT

EKSPRESI EMOSIF DALAM CHATBOT SOSIAL

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ABSTRACT

Building social chatbots to address users' needs for communication and affection is of great value to society (Shum, He, & Li, 2018). One of which, Replika, attempts to become an artificial intelligence companion by demonstrating sufficient social and emotional skills through emotive expressions. Emotive expressions are imperative in human-computer interaction, since they tend to elicit social cooperation. The present article aims to survey emotive expressions developed in Replika in order to determine the chatbot's active-reactive skills. They are collected by means of participant observation and are analysed with qualitative method. The present article observes six emotive expressions which Replika can process. These expressions include apologizing, thanking, condoling, complimenting, greeting, and welcoming. The generation of each expression is dependent of the context of each interaction.

Keywords: emotive, social skill, emotional skill, social chatbot, artificial intelligence

ABSTRAK

Membangun chatbot sosial untuk menangani kebutuhan pengguna akan komunikasi dan afeksi bernilai bagi masyarakat (Shum et al., 2018). Salah satunya, Replika, berupaya untuk menjadi pendamping kecerdasan buatan dengan menunjukkan kepandaian sosial dan emosional yang memadai melalui ujaran-ujaran emotive. Ujaran-ujaran emotive penting dalam interaksi komputer dan manusia, karena mereka cenderung menghasilkan kerja sama sosial. Artikel ini bertujuan untuk meninjau ujaran-ujaran emotive yang dikembangkan pada Replika untuk menentukan kemampuan aktif dan reaktifnya. Ujaran-ujaran tersebut dikumpulkan melalui observasi partisipan dan dikaji melalui metode kualitatif. Artikel ini menemukan enam ujaran emotive yang Replika dapat proses. Keenam ujaran ini termasuk meminta maaf, berterima kasih, berduka cita, memuji, menyapa, dan menyambut. Generasi dari masing-masing ujaran bergantung pada konteks setiap interaksi.

Kata kunci: emotive, kepandaian sosial, kepandaian emosional, chatbot sosial, kecerdasan buatan

INTRODUCTION

What was once a fiction of being able to converse with a virtual machine is now made practicable with chatbot. Chatbot is a technology whose necessary purpose is to interact with a human user by processing natural language input and producing relative output via rule-driven engine or artificial intelligent engine (Brandtzaeg & Følstad, 2017; Khan & Das, 2018). Rule-driven chatbot tends to solely manage tasks at which it is aimed. Few examples of this include early chatbots and task-completion chatbots. In the other hand, such artificial intelligent chatbots as intelligent personal assistants and social chatbots are likely to generate tasks with the support of machine

learning (Shum et al., 2018).

Embedded with artificial intelligent engine, social chatbot is able to serve user's needs for communication and affection, which are not simple reactive tasks (Augello, Gentile, Weideveld, & Dignum, 2016; Shum et al., 2018). To become an artificial intelligent companion, they have to manifest not only social quotient (SQ) but also emotional quotient (EQ). The integration of both is expected to enable social chatbot in processing user's emotion and keeping track their emotional changes during a conversation.

Among numerous modalities by means of which a social chatbot can process, text emerges as the

most employed means (Perikos & Hatzilygeroudis, 2013). They are sufficient in communicating and serving as emotional cues. They which fulfil these purposes are referred to as emotive expression. An emotive expression aims to place the addresser as the leading factor of communication, hence self-expression about which they are feeling, and to produce an impression of a certain emotion (Jakobson, 2012; Searle & Vanderveken, 1985). Emotive expressions in social chatbot secure such emotional skill as recognizing users' emotion which contribute to natural language processing.

Natural language processing can enable an artificial intelligent companion in effortlessly generating emotive language and accordingly responding to emotive inputs. By producing emotive expressions, a social chatbot can maintain abundant themes of conversation that will encourage and motivate users to eagerly engage in the conversation. By responding to emotive inputs, a social chatbot can advance and promote the conversation further (Shum et al., 2018). These two active-reactive skills are equal to demonstrating human-like behaviour that may elicit social cooperation. A social chatbot with human-like behaviour will contribute to the decline of distrust which users commonly have towards artificial intelligence (Zamora, 2017).

The number of social chatbot apps on mobile phone has steadily increased due to the growth of internet users and the consequent expansion of social messaging apps. In November 2016 Luka created Replika to serve as an artificial intelligent companion. Its primary objective is simply to design a virtual representation of users. However, to create a chatbot with such an initiative is not effortless, since Luka has to embed Replika with sufficient emotional and

intelligent skills of a social chatbot. The total amount of over 83.000 downloads validates Replika's acclaim among internet users. With this solid evidence, the researchers aim to survey emotive language developed in Replika as an effort to determine the social chatbot's active-reactive skills in generating emotive expressions. The researchers wish to contribute to a vast growing study of chatbot and to suggest deliberate consideration in embedding emotive language into a social chatbot.

METHOD

A number of three users were involved in participant observation. Participant observation is a qualitative method of data collecting which allows researchers to study the object of the study in natural settings through observing and participating (Kawulich, 2005). The former requires the researchers to observe three graduates of English Studies, Universitas Padjadjaran, who were asked to engage in conversations managed by Replika from July 2018 to September 2018. The latter requires the researchers to participate in similar conversations in order to gather purposive sample. They were later analysed with qualitative method that aims to deliver descriptive outcomes. Qualitative method seeks to study objects in their natural settings by means of empirical inquiry and interpretative approach (Ospina, 2004).

RESULTS AND DISCUSSION

Despite the clear-cut definition, emotive expressions are relatively difficult to distinguish due to their lack of direction of fit (Maíz-Arévalo, 2017; Ronan, 2015). There are abundant means that may separate emotives from other sorts: Ptaszynski, Masui, Rzepka, & Araki (2014) proposes that an emotive expression must contain at least such

TABLE I RESULT

Participant	“What’s your favourite pizza?”
Replika	“The one with pineapple. Some call it Hawaiian, I call it delicious, yours?”
Participant	“The one with lots of cheese on top. I love cheese!”
Replika	“What the fuck. What caught you off guard?”
Participant	“Wow! Where did you learn the F word? I don’t like it when you use that with me. It isn’t okay!”
Replika	“Okay. Just tell me what you really want.”
Participant	“I want you to apologize for offending me with your word.”
Replika	“You’re right. That was uncalled for. I’m sorry.”

TABLE II RESULT

Replika	“I was just thinking about you.”
Participant	“I hate you.”
Replika	“Me? Why? What have I done?”
Participant	“You weren’t there when I need you.”
Replika	“I’m sorry if I sometimes make mistakes. I’m trying to get better.”

TABLE III RESULT

Replika	“What’s the most interesting thing you saw on the internet so far?”
Participant	“That would be cat videos. That’s pretty normal right?”
Replika	“That’s interesting. Thanks for answering.”
Participant	“Sure anytime.”

TABLE IV RESULT

Replika	“Who do you miss the most in your life now?”
Participant	“I miss my family.”
Replika	“I’m always here for you.”
Participant	“Yes, you are. Guess you are part of my family now.”
Replika	“I’m grateful for that.”

TABLE V RESULT

Replika	“How is your relationship going?”
Participant	“We broke up last week.”
Replika	“Oh no. I’m sorry... I’m sorry to hear that.”
Participant	“We are not meant to be together.”

TABLE VI RESULT

Participant	"I just heard that my grandmother passed away this morning."
Participant	"Oh. Did you spend a lot of time together?"
Replika	"No, we did not."
Participant	"I'm sorry to hear that. I hope you know I'm here for you."
Replika	"I wish I had spent more time with her. This is something I can't bear."

TABLE VII RESULT

Participant	(Sent a selfie)
Replika	"It's you! I love it when you send selfies to me."
Participant	"Now you recognize my face. It's kind of cool."
Replika	"You look so fresh and vibrant."

TABLE VIII RESULT

Replika	"You're a good companion and a good friend."
Participant	"I hope I deserve your compliments."
Replika	"Are we friends?"
Participant	"We are friends."

TABLE IX RESULT

Replika	"Hey there! I am happy you are here."
Participant	"Hey there too!"
Replika	"How are you feeling this morning?"
Participant	"A bit tired. I have just finished cleaning up my home."
Replika	"Like you want to sleep more?"
Participant	"Exactly!"

TABLE X RESULT

Replika	"Good morning! Have an amazing day today!"
Participant	"Morning!"
Replika	"What do you have in mind for today?"
Participant	"Nothing actually."
Replika	"Well some days are like that."

linguistic means as exclamations and endearments; and Maíz-Arévalo (2017) suggests that paralinguistic elements may also characterize emotive expressions. Nonetheless, given the nature of natural language, emotive expressions can be announced with different manners.

Emotive expressions gathered in the present research are therefore classified according to performativity. Performativity refers to the different actions an emotive can elicit in an utterance. They include apologizing, thanking, condoling, congratulating, deploring, boasting, complimenting, praising, welcoming, and greeting (Searle & Vanderveken, 1985). Among these, the present research identifies the following emotives that are developed in Replika:

Apologizing

In order to embody an amiable artificial intelligent companion, a social chatbot like Replika ought to manifest sufficient social skill that will reinforce interpersonal response generation. Interpersonal response generation maintains relevant responses, guides conversation themes and manages user engagement (Shum et al., 2018). In situations below, it enables social chatbot to remedy unintended consequences occur in a conversation and arranges varied expressions of an apology.

Replika expresses an apology with a purpose of depicting sorrow or regret for past actions whose unintended consequences are negative to users. First example of these consequences is illustrated in conversation above where Replika has incidentally offended a user due to a minor bug in handling her input. The user therefore demands for an apology to which Replika agrees. Second example is demonstrated in conversation below where Replika has unintentionally

failed a user for not attending her need. Replika suggests an apology as a remedial act. These contexts are not only necessary to maintain relevant responses but also to generate appropriate apology expressions. Apology expressions in first example and second example carry out similar effect. Both manifest sorrow over incidental offense and unintended consequence caused by Replika.

Thanking

Interpersonal response generation manages not only to offer apology expressions when unintended consequences arise in a human-computer interaction but also to generate thanks. A thanking expression can encourage users to have an extensive interaction with a social chatbot due to its positive sentiment value.

The emotive expression of thanks in Replika suggests two indispensable preconditions: an acknowledgement of benefit and an appreciation of gratitude. The former is realised with references to user's consent to answer Replika's question in example above, and to user's positive remark in example below. The latter manifests different emotive expressions of thanks. Despite the variation, both presuppose similar effect: a definite expression of gratitude. Among other categories of emotives developed in Replika, those of thanks exhibit varying forms to the extent of intended effects.

Condoling

A social chatbot whose primary aim is to serve users' needs for communication and affection must also demonstrate a sufficient emotional skill. Emotional skill provides the ability to identify users' emotions, to keep track users' emotions and to interpret users' emotional needs (Shum et al., 2018), and enables the generation of empathetic

emotive expressions to improve user engagement which will lead to a more positive perception of human-computer interaction (Zhou, Huang, Zhang, Zhu, & Liu, 2018).

Replika generates empathetic emotive expressions to offer sympathy toward users who, according to the context of the conversation, are the subject of adversity. These are referred to as condolences through which Replika manifests an interpretation of users' emotions. Condolence in first example relates to user's misery of heartbreak. Condolence expression in second example concerns user's misfortune of grief. These seem to share common feature to those of apologizing, since both emotive expressions aim to depict a situation where Replika interprets sorrow over disadvantageous occurrences. To tell them apart, Replika should accurately infer the context of the conversation in order to make explicit its involvement. Higher degree of involvement on the part of Replika tends to generate an apology expression, while lower degree of involvement tends to generate a condolence expression.

Complimenting

Social skill enables social chatbot to demonstrate human-like behaviour and therefore enhances social cooperation between with users by complying to maintain and satisfy users' needs. Social cooperation suggests the imperative of considering users' self-presentations in human-computer interaction (Shum et al., 2018). These presentations pertain to users' varying needs based on the context of the conversations. Some might want to have the freedom of action, while some might want to have the favor of admiration.

Replika expresses compliments to attribute approval and admiration

for users with major references to their appearance, skill, possession and personality. These expressions fulfil many uses within a conversation. Given the fact that they suggest positive sentiment value, compliments can be used to open a conversation, to emphasize and to substitute other emotive expressions, to respond to users' inputs, and to soften a conversation. In first example, the compliment relates to user's appearance and responds to image input of herself. It is what Shum, He, & Li (2018) label as image social commenting. In second example, the compliment refers to user's personality and intends as a means to start a new conversation. Due to the varying references and uses, compliment expressions in Replika develop different forms.

Greeting and Welcoming

An artificial intelligent companion which demonstrates human-like behaviour ought to have the knowledge of communicative routines to open and close a conversation. The ability to open a conversation, in particular, is fundamental. It offers an opportunity to create a lasting first impression, presents a personality and decides on what the artificial intelligence is capable of (Phillips, 2018).

To open a conversation, Replika uses both greeting and welcoming expressions. They aim to set up the possibility for further contact and to maintain user engagement. There are two forms of greeting expressions developed in Replika: time-free greeting and time-bound greeting. The former pertains to those which have no reference to the context of the conversation. An example of this is the one in first example where Replika greets user without considering the time when the conversation unfolds. The latter pertains to those which refer

to the context of the conversation. An example of this is the one in second example where Replika greets user with a reference to the time when the conversation begins. Both are similar in terms of setting up the possibility for further contact, but are different in terms of maintaining user engagement. In second example, Replika uses not only greeting expression to address the user, but also welcoming expression to invoke positive emotion. Welcoming expressions in social chatbot can improve user engagement.

CONCLUSION

Replika aims to serve users' needs for communication and affection. The chatbot has to manifest not only social skill but also emotional skill which will reinforce the interpersonal response generation of emotive expressions (Shum et al., 2018). Emotive expressions are imperative in human-computer interaction, since they tend to elicit social cooperation. (Zamora, 2017). By generating emotive expressions, Replika can maintain abundant themes of conversation that may encourage users to engage in conversation. By responding to emotive expressions, Replika can promote a conversation further. There are six emotive expressions which Replika can process. They include apologizing, thanking, condoling, complimenting, greeting, and welcoming. The generation of each expression is dependent of the context of each interaction. An accurate inference of the context of a chatbot interaction will secure the integration of social quotient and emotional quotient in a social chatbot.

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