

## 論文内容の要旨

博士論文題目 Eliciting Emotion Improvements with Chat-based Dialogue Systems

(雑談型対話システムによる感情状態向上の誘発)

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### 要旨

Social interactions can support the treatment of emotion-related problems by aiding a person's emotional process. A number of studies have showed a consistent inclination of humans to talk about and socially share their emotional experiences, especially for an intense and/or negative emotion exposure [70]. Although we have seen encouraging progress in affective human-computer interaction, the potential benefits for users by incorporating emotion in computer interaction are not yet studied in depth. For example, emotion elicitation looks at the change of emotion in dialogue, however its application to for emotional improvements is not yet well researched. Furthermore, although there exist technologies that address clinical emotional disturbances, such as depression [23] and distress [24], there is a lack of research on emotion improvement from negative emotional exposures commonly encountered in everyday life.

The goal of this thesis is to diminish these gaps. In particular, I aim for chatbased dialogue systems with an implicit goal of eliciting emotion improvements through dialogue interactions. The concept of eliciting emotional improvements can be examined through two perspectives: *short-term* and *long-term*. Assuming positive emotional state as the goal, short-term elicitation of emotional improvement is reformulated into turn-based positive emotion elicitation. In turn, long-term emotional improvement extends elicitation scope to the entire dialogue. This thesis will be focusing on the short-term improvement elicitation task, exploring dialogue aspects contributing to a successful elicitation and modeling them in a dialogue system. In addition, potential approaches of extension into long-term emotion elicitation are investigated.

First, I study emotion processing and negative emotion recovery in human communication through corpus construction and analysis. Second, to endow dialogue systems with an attunement of emotional context in dialogue, I propose novel neural network architectures that allow a dialogue system to track emotion and incorporate this

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(論文審査結果の要旨)

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The goal of this thesis is to diminish these gaps. In particular, I aim for chat-based dialogue systems with an implicit goal of eliciting emotion improvements through dialogue interactions. The concept of eliciting emotional improvements can be examined through two perspectives: *short-term* and *long-term*. Assuming positive emotional state as the goal, short-term elicitation of emotional improvement is reformulated into turn-based positive emotion elicitation. In turn, long term emotional improvement extends elicitation scope to the entire dialogue. This thesis will be focusing on the short-term improvement elicitation task. In addition, potential approaches of extension into long-term emotion elicitation are investigated.

First, the thesis describes corpus construction and analysis. Second, to endow dialogue systems with an attunement of emotional context in dialogue, I propose novel neural network architectures. Third, novel methods to learn dialogue strategies for short-term positive emotion elicitation in chat-based dialogue systems are proposed. Lastly, the thesis presents the result of preliminary study on long-term emotion improvement elicitation.

The thesis proposed solutions to the problems which haven't been solved and series of his research resulted in three journal papers and five peer reviewed international conference papers. As a result, the thesis is sufficiently qualified as Doctoral thesis of Engineering.