

Verbal and Nonverbal Greetings as a Unit of Social Interaction between Human and Robot

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Abstract This investigation considers verbal and nonverbal greetings as a unit of social interaction between human and robot. The social interaction process is divided into three stages: initiation, continuation, and termination. In this research, we explore each stage of social interaction in the context of sharing greetings. The greeting process continues or ends depending on the level of interest expressed by the user. The challenge of this research is to explore efficient verbal or nonverbal greeting expressions in each stage in order to design social human-robot interaction.

Keywords Verbal Greetings · Nonverbal Greetings · Initiation · Continuation · Termination · Interest · Boredom

1 Introduction

Greetings act as a starting point for interaction among people. They are particularly important for service industry employees to build trust and rapport with customers [7]. Greetings are also the first step in human-robot interaction [4]. In particular, socially assistive robots engaged in reception or healthcare need to make appropriate expressions during the greeting process in order to effectively provide services to humans. In this regard, the purpose of this research is to investigate greeting expressions and processes, and apply them to social human-robot interaction.

2 Greeting Expressions

Humans use various communication cues in daily conversations. These communication cues are divided into two categories: verbal and nonverbal expressions. When starting or ending a greeting, we use direct words or behaviors, such as facial expressions, gestures, and distance adjustments [3, 5]. When a person and a robot share greetings, they can also use both verbal and nonverbal cues.

3 Greeting Processes

Greetings are a rudimentary interaction between humans. However, they are composed of complicated and subtle steps, requiring specific behaviors or verbal expressions at each step [5]. Social interaction generally proceeds in the order of initiation, continuation, and termination [1, 6]. Given that greetings are a unit of social interaction, we can classify the greeting process by these three steps.

4 Level of Interest

Greeting expressions at each stage can be assigned on the basis of level of interest. Human beings continue to perceive and express interest or boredom [3]. A conversation begins when at least two people express interest, while a conversation ends when at least one person expresses boredom [2]. In order for the conversation to continue, more than one person should share interest [3].

5 Conclusions

In our study, greetings were considered as a signal to initiate each step of social human-robot interaction. The challenge of this research was to explore effective verbal or nonverbal greetings triggering each interaction stage by applying verbal and nonverbal social cues to robots (See Table 1).

Table 1. Verbal and Nonverbal Greetings in the Social Interaction Process [4-5].

	Verbal Greetings	Nonverbal Greetings
Initiation (Interest)	Call out Add to conversation Ask questions	Establish eye contact Smile Move closer
Continuation (Interest)	Make long utterances Ask personal questions Agree with other	Nod head Laugh Touch other
Termination (Boredom)	Make short utterances Give closed-ended responses End conversation	Look away Turn away Move away Yawn

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