

Robotics

Gestures and ‘interruptivity’ boost interaction

Life-like gestures and self-correction allow better communication with an android

Helpful androids — robots in human form — cannot yet be found in shopping malls, but researchers from NAIST are busy working to make this possible. They have programmed an android to make realistic gestures and recognize the speaker in a group of people facing it.

Robots that look like humans need to behave in a very life-like way. Otherwise, a human interacting with them will experience ‘the uncanny valley’; a feeling of revulsion experienced when an object is nearly, but not quite, like a human being — such as seeing a corpse or zombie.

“The goal of this research is to take androids beyond the ‘uncanny valley,’” says Jun Takamatsu, a robotics scientist at NAIST¹. Using motion capture film techniques, his group recorded the normal gestures of ten volunteers and these movements became the basis for the android’s gestures. “The gesture that the android should use when answering each type of question was defined and stored in a database,” explains Takamatsu.

The Actroid-SIT android they have programmed looks like a shop mannequin. ‘She’ turns to face any person who holds a microphone. As the person speaks, the

android looks at them and makes small appropriate movements, such as nods and bows. Actroid-SIT can glance to the side, turn her head and look directly at someone. She makes meaningful gestures as she answers their questions — pointing to the bathroom, for example.

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The team measured the android’s effectiveness on 1,662 people attending an exhibition, who encountered the android standing behind a roped-off barrier. When Actroid-SIT could make gestures, more than 60% of the subjects who approached her then spoke to her; a significantly greater proportion than when her gestures were disabled.

The android also sports ‘motion interruptivity’: when she fails to recognise a speaker’s remark or detects an unusual response from a person, she stops the gesture she is making and selects a different gesture and spoken response.

People at the exhibition talked to the android for significantly longer than when motion interruptivity was active.

“We are interested in service robots, which need to react to human demands appropriately,” says Takamatsu. “This research has solved the issue of generating natural gestures in real time. We believe this is a very important first step.” “There is a long way to go, but I can imagine androids like this providing information to people in shopping malls, train stations and airports.”

Reference

1. Y., Kondo, K., Takemura, J., Takamatsu, T., Ogasawara. A gesture-centric android system for multi-party human-robot interaction. *Journal of Human-Robot Interaction* 2, 133–151 (2013).



The Actroid-SIT android made by Kokoro Company Ltd and programmed by the NAIST team.