Perception of a virtual 3D character waving at different speeds

CP3_group1
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Abstract

Waving is a gesture that is used daily. It could be used in the purpose as a greeting between people or in the purpose of asking for help. A waving gesture have the ability to radiate different feelings. Exactly which feeling is of course affected by different factors, like speed. A user test was conducted were a character in HoloLens were waving in three different speeds; slow, normal and fast. Results showed that there is a connection between perceived feelings from the waving gesture depending on the speed of the waving.

Background

AR technology can be used to evolve the user's perception, not only in gaming and social networks but also in healthcare and education. Bodily gestures can be useful in making conclusions about unspoken intentions. When designing virtual characters, the ability to recognize emotions of body movements is important. Through changes in the speed of a movement, emotions are often easier to detect. [1]

In a previous study, Amaya et al. [2] defined the difference between the expressed emotion in an animated character compared to the natural human motion, with two components, speed and spatial amplitude. Another study claims that human observers read body language with ease and the perceptual sensitivity cannot be understood from the study of sensory mechanisms alone. Instead, the visual perception of human actions is deeply constrained by motor, social, and emotional mechanisms. [3]

Goal

The aim of this study is to investigate how people perceive waving gestures from a virtual 3D character, Hologram in AR at different speeds. Could the speed of the wave affect the users' perception of the waving?

%	Speed 1	Speed 2	Speed 3
Happy	10	20	0
Neutral	40	30	20
Sad	50	50	80
Stressed	20	60	90
Neutral	0	10	0
Calm	80	30	10
Excited	10	20	30
Neutral	10	10	30
Unexcited	80	70	40
Friendly	80	60	10
Neutral	10	20	10
Hostile	10	20	80
Afraid	20	40	80
Neutral	20	20	10
Safe	60	40	10

Percentage of participants' perception at different speeds.

Method

A user test was conducted using a hologram created in Unity and a questionnaire for collecting data about each speed and perceived feeling. We used different premade assets found in the Unity Asset Store, they had to be tweaked together in order to work though. The assets consisted of one female humanoid[4] and two gestures: an idling gesture [5] and a waving gesture[6]. The interaction with the hologram was enabled with a pair of HoloLens glasses. There were three differents speeds on the waving gesture; 1 = slow speed, 2 = normal speed and 3 = fast speed. The questionnaire was initiated with some personal questions, and then for each speed the participant answered questions about how they perceived the waving. The data could be obtained through the scale that existed for each question. The amount of people and the percentage of people for each feeling at each question were obtained and analysed. The participants in the study consisted of a total of 10 students.

Result

	People	Procent
Very	2	20
Neutral	2	20
Not at all	6	60

Amount of people and percentage for the question "How realistic did it feel?"

The result is presented in these charts and the conclusion of it below. For More detalis about the result please talk to us!

Conclusion

Since we could not retrieve any valid data it is hard to claim any conclusion out of our analyses but perhaps this study could act as guideline for future research. Even though we couldn't retrieve any valid data our result showed that there is a connection between perceived feelings from the waving gesture depending on the speed of the waving. By increasing the speed of the waving emotions do change. With a greater participation this data might be valid for future research.

References

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3. Maggie Shiffrar. 2012. The visual perception of dynamic body language. *Embodied Communication in Humans and Machines*: 95–110. https://doi.org/10.1093/acprof:oso/9780199231751. 003.0005