CS449_549 HUMAN COMPUTER INTERACTION

IDENTIFY YOUR TERM PROJECT

Note: Only one of the group members should upload this file to SUCourse. Use this template.

Due date – Upload to SUCourse by December 23, Monday, **(Late submission will not be accepted)**
Grading: 4 points

Group member-1 : Elifnur Zengin, 31237, elifnur.zengin@sabanciuniv.edu

Group member-2 : Sevdenaz Yılmaz, 30300, sevdenaz.yilmaz@sabanciuniv.edu

Group member-3 : Seçil Gezer, 29145, secilgezer@sabanciuniv.edu

Group member-4 : Deren Doğan, 29561, derendogan@sabanciuniv.edu

Project Title: *Exploring Realism in On-Screen Embodied Characters: Factors & Impacts*

Abstract: *The present research analyses the credibility of embodied characters on the screen and the effects of this credibility on user perception and involvement. The research intends to examine characters of assorted realism levels to identify aspects like appearance, movement quality, and interactivity that would contribute to the successful utilization of the characters. The experiment will include user-based testing to obtain the quantitative and qualitative data concerning user preferences and perceptions. The findings will inform the development of human-like characters intended for higher engagement and usability.*

Research Questions:

1. *How does the level of realism in on-screen embodied characters affect user perception, interaction, and engagement?*
2. *What are the key factors (ex: appearance, mimics, motion, interactivity) that contribute to the perception of realism in on-screen characters?*
3. *How do varying levels of realism impact users' emotional and cognitive responses during interaction?*

Related Literature:

1. The first study in the references section introduced the uncanny valley theory and showed how close-to-realistic characters make users uneasy. It thus provides a theoretical background for comprehending user reactions to human characters.
2. The second research talked about the effects of the uncanny valley on the players' experiences in the gaming media by conducting questionnaires to have feedback from users about the importance of motion and appearance in user perception.
3. Our third reference looked at the role of motion and rendering styles in increasing or decreasing the perceptual realism of animated characters-with insights over and above the uncanny valley.
4. The fourth study indicated that moderate embodiments can serve as facilitators to human-robot interaction as far as user engagement and trust are concerned.
5. The fifth study had neuroscientific explanations on why users are likely to experience discomfort caused by near-to-realistic characters.
6. Finally, the last referenced research looked at how motion quality and rendering styles combine to affect perception with respect to human-like characters and did provide some design considerations.

Methodology*:*

- ***Participants:*** *20 participants, aged between 18-30, will be recruited through volunteer sampling. Participants will include students and young professionals familiar with on-screen characters.*
- ***Materials:*** *A selection of video clips or images featuring characters of varying realism levels (cartoonish, semi-realistic, hyper-realistic). A post-test questionnaire and a SUS scale for data collection.*

- ***Data Collection:*** *Participants will rate characters on a scale of realism, likability, and interactivity. Qualitative data will be gathered through open-ended feedback and observation of user interactions.*
- ***Participant Requirements:*** *Participants will view characters in a controlled environment (e.g., a computer lab) and complete the questionnaire after the session.*
- ***Analysis:*** *Data will be analyzed using statistical methods (e.g., ANOVA for ratings) to identify patterns and thematic analysis for qualitative feedback.*

Limitations:

1. *The lack of representation in participants can limit the generalization of finding.*
2. *Tests in a controlled environment may not resemble what users would ordinarily face.*
3. *There is potential bias with respect to the prior acquaintance of participants with characters or genres.*

References:

1) Mori, M., MacDorman, K. F., & Kageki, N. (2012). The uncanny valley [From the field]. *IEEE Robotics & Automation Magazine*, 19(2), 98-100.
2) Tinwell, A., Grimshaw, M., & Abdel Nabi, D. (2015). Effect of uncanny valley on user experience in games. *Computers in Human Behavior*, 49, 167-173.
3) McDonnell, R., Breidt, M., & Bülthoff, H. H. (2012). Render me real? Investigating the effect of motion and rendering styles on the perception of animated characters. *ACM Transactions on Graphics (TOG)*, 31(4), 91.
4) Thompson, W., Trafton, J. G., & McNamara, L. A. (2011). The role of embodiment in human-robot interaction. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 55(1), 385-389.
5) Saygin, A. P., Chaminade, T., Ishiguro, H., Driver, J., & Frith, C. (2012). The thing that should not be: Predictive coding and the uncanny valley in perceiving human and humanoid robot actions. *Social Cognitive and Affective Neuroscience*, 7(4), 413-422.
6) Walker, M., & Hodgins, J. K. (2010). Evaluating the importance of motion and appearance in the perception of human-like characters. *ACM Transactions on Graphics (TOG)*, 29(4), 127.