Error Analysis in Embodied Conversational Agents

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Embodied Conversational Agents are good at communicating through facial expressions.

But what if they show errors such as saying "Interesting!" while showing a bored face?
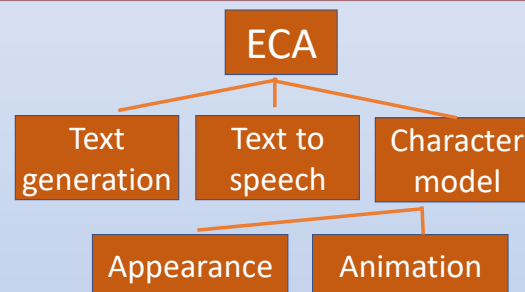
Background

Embodies Conversational Agents (ECAs) are computer-generated characters graphically represented with a body in a virtual environment. They extend text-based chatbots to enable face-to-face communication with human users. In this review, we will focus on works that analyzes how errors in speech and animation affect users' perception of the agent.

Literature: ECA Errors

Conversational Errors: errors in the content of the agent's speech:
- No response
- Wrong answer
- Repetition
- Incoherence
- Interruption

Some make the agent *more* likable by human users, some *less*.[1]

ECA
- Text generation
- Text to speech
- Character model
  - Appearance
  - Animation

Yin: That sounds interesting!

ECA work in progress built for this project

Animation Errors: unnatural or unexpected movement of different parts of the body (face, eye, lip, hand, etc.). Different animation errors affect users' perception differently. Disease-like animations, for example, are the least preferred by human users.[2] Studies show that face animation errors are more noticeable than other animation (e.g. finger),[2] though the latter may still alter the perceived emotion.[3]

Proposed Work

We will study the mismatch between chatbot-generated text and the corresponding animation expressed by the ECA. We will develop an ECA model that combines neural net based chatbot (ParlAI[4]), 3D character (Unreal Engine), text-to-speech frameworks. We will design different scenarios of mismatch errors and conduct experiments via crowdsourcing.

References:

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[2] Hodgins, Jessica, Sophie Jörg, Carol O'Sullivan, Sang Il Park, and Moshe Mahler (2010)."The saliency of anomalies in animated human characters". In:ACM Transactions onApplied Perception (TAP)7.4, pp. 1–14
[3] Jörg, Sophie, Jessica Hodgins, and Carol O'Sullivan (2010). "The perception of fingermotions". In:Proceedings of the 7th Symposium on Applied Perception in Graphics andVisualization, pp. 129–133
[4] Miller, Alexander H, Will Feng, Adam Fisch, Jiasen Lu, Dhruv Batra, Antoine Bordes, DeviParikh, and Jason Weston (2017). "Parlai: A dialog research software platform". In:arXivpreprint arXiv:1705.06476

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