

A Virtual Agent as a Commensal Companion

Commensality

*the practice of sharing food and eating
together in a social group*

Ochs and Shohet, 2006

- Important social activity
- One of the most frequent and common human experiences
- Time for celebration, making business, and creation of new social bounds
- Several positive impacts of commensality were observed

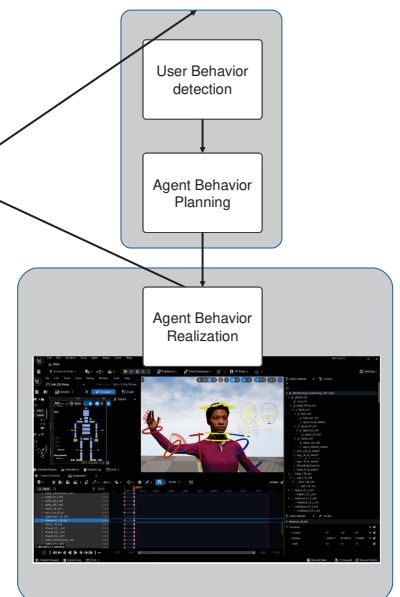
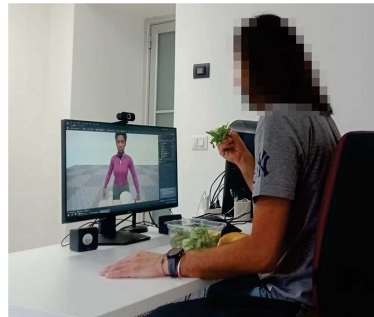


Aim

- We aim to use technology to provide users with the benefits of commensality when they are forced to eat alone
- Artificial Commensal Companion (ACC):
*autonomous and socially intelligent agent
designed to interact verbally and nonverbally with
humans during mealtime*
- Until now, social robots mainly used [1, 2, 3]

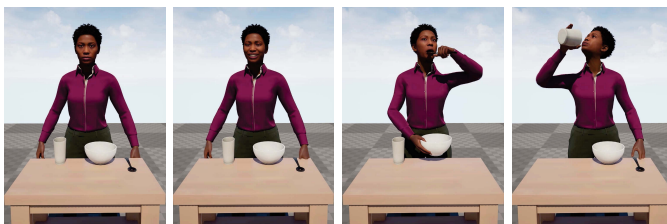
System

- Virtual agent created in Unreal Engine
- ACC capable of detecting the user activities (e.g., speaking, smiling, chewing) but cannot understand the speech
 - MediaPipe is used to extract the facial features in real-time
 - activity classification with MLP on 0.5s segments
- ACC capable of responding accordingly (e.g., asking simple questions, providing backchannel responses), and simulate eating



Evaluation

- Participants invited to eat a sandwich or salad in company of the agent
- They fill out a questionnaire composed of 7 open, 2 binary and six 5-point Likert scales



Quantitative results:

- People:
 - favor the general idea, enjoyed eating with the ACC
 - would prefer to have the company of ACC than eat alone
 - felt comfortable with the ACC, which was perceived as neither irritating nor engaging
 - would like to repeat the experience with a different ACC

Qualitative results:

- The experience was positive, weird, unusual, fun
- Need for more rich interaction and better synchronization with human
- negative remarks: agents' tendency to interrupt humans, behavior repetitiveness
- Applications include the elderly and individuals in solitude, socio-healthcare settings, and fast-food
- risks revolve around privacy, tendencies toward self-isolation, and the abandonment of social habits

[1] R. Niewiadomski, M. Bruijnes, G. Huisman, C. P. Gallagher, and M. Mancini. 2022. Social robots as eating companions. *Frontiers in Computer Science* 4 (2022).

[2] Fujii, A., Kochigami, K., Kitagawa, S., Okada, K., & Inaba, M. (2020, August). Development and evaluation of mixed reality co-eating system: Sharing the behavior of eating food with a robot could improve our dining experience. In *2020 29th IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)* (pp. 357-362). IEEE.

[3] Khot, R. A., Arza, E. S., Kurra, H., & Wang, Y. (2019, May). Fobo: Towards designing a robotic companion for solo dining. In *Extended abstracts of the 2019 CHI conference on human factors in computing systems* (pp. 1-6).