We invite students from various disciplines to participate in a unique project that redefines the boundaries of human-machine interaction. The aim is to program the humanoid robot Pepper to play a key role in bridging communicative barriers between the hearing and the deaf community, thus fostering social inclusion and enhancing communication technologies.

Problem definition
The core issue addressed by this project is the communicative divide between individuals with and without hearing impairments. The absence of a common language platform hampers seamless communication, leading to social and educational exclusion. By leveraging Pepper to translate spoken language into sign language and vice versa, we aim to mitigate these barriers, fostering a more inclusive environment.

Description
The primary challenge is developing and implementing algorithms that enable Pepper to translate spoken language into sign language in real time, and vice versa. This involves not only the technical aspects of speech and gesture recognition but also a deep understanding of the nuances and grammatical structures of both languages to ensure accurate and contextually relevant translations.

Key questions
- How can we accurately translate spoken language to sign language and vice versa in real-time?
- What are the best practices for implementing speech and gesture recognition in humanoid robots?
- How can Large language Models (LLMs) be integrated to enhance the quality of translation and adapt to specific communicative contexts?
- In what ways can Pepper be utilized as an educational tool in teaching environments to benefit both hearing and deaf students?
- How can we reduce latency in the real-time processing pipeline while working with limited resources?

Links
Chair for Human-Centered Technologies for Learning
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Skills
Proficiency in programming and algorithm development.
- Knowledge of speech and gesture recognition technologies.
- Understanding of linguistic nuances and grammatical structures of both spoken and sign languages.
- Creativity and problem-solving abilities.
- Teamwork and interdisciplinary collaboration skills.

Partner
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