Emotive Gestural Expressions for Assistive Home Humanoid Robots: Simulation Test

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Introduction: A home assistive system, utilizing the Internet of Robotic Things, requires an interactive robot capable of autonomously understanding and engaging with the residential environment. This robot should express emotions through voice, movements, and expressions to pass a sensation that it is more than a mere machine and create an interaction more related between a human and a living assistant [1], and enhance the human-machine interaction experience, making it more friendly, enjoyable, and engaging [2], being even more useful and careful with elderly and people with disabilities. The article outlines a method for implementing these gestures to express a humanoid image authentically.

Materials and Methods: A Pepper robot by Aldebaran was simulated on CoppeliaSim and linked to the software Choregraphe through a Python script, being able to send gestural expressions to the simulated robot using the Choregraphe software. The structuring of the program's communication can be seen in Figure 1.

Results: Pepper can act with a library of gestural moods, dances, and poses. The library contains positive, negative, and neutral gestural communication, making the interaction human-machine more friendly and authentic. Figure 2 shows an example of a thinking gesture.

Discussion/Conclusion: These gestural commands can be linked to a Large Language Model and make every response linked to a gestural expression, making robot answers more emotional. This system can be also used on other humanoid robot models, and other gestural libraries can be found in open-source repositories, making the expressions even more complex.

Figure 1: Program's communication	Figure 2:Pepper thinking gestural
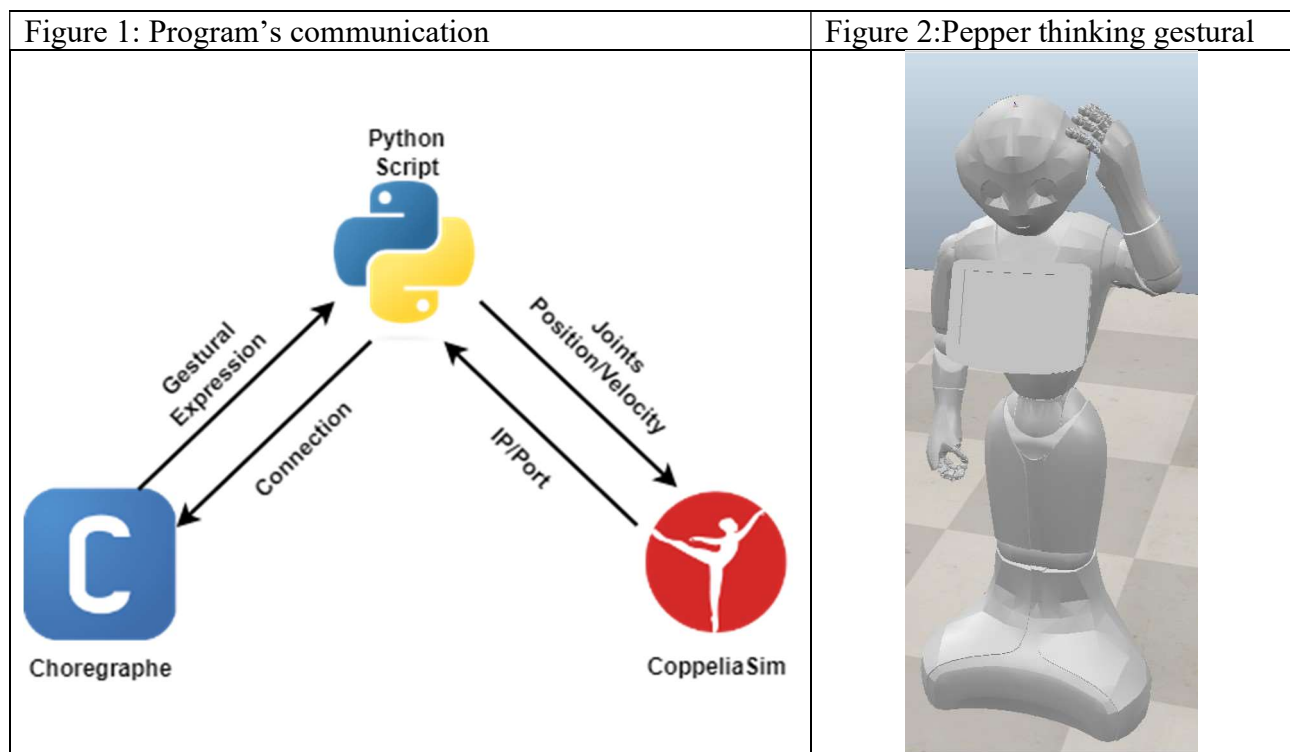
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