

Human-Robot Interaction with Non-Linguistic Utterance Sounds

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This project explores the role of non-linguistic utterances (NLUs), sounds not associated with spoken language, to communicate emotion for human-robot interaction (HRI) research. Specifically, we are investigating how robots can convey emotions through NLUs along continuous dimensions of valence (positivity/negativity) and energy (intensity). The sounds are generated with a python script using many different musical parameters such as tempo, mode, articulation, and chord selections to reflect various emotional states. In the human subjects study, a Nao V6 humanoid robot produces musically expressive, randomly generated sounds lasting 7 to 11 seconds, which are triggered by identifying unique visual patterns (Naomarks) on cubes when presented by participants. Participants are first trained with four practice sounds, then interact with the robot in four rounds of nine trials each (36 total), rating the perceived emotion of the robot after each sound using the Self-Assessment Manikin (SAM) scale. We plan to conduct experiments in the future. This study aims to contribute to our understanding of cross-cultural and accessibility communication using sounds instead of common language.