Carnegie Mellon University Africa

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Culturally-Sensitive Social Robotics for Africa

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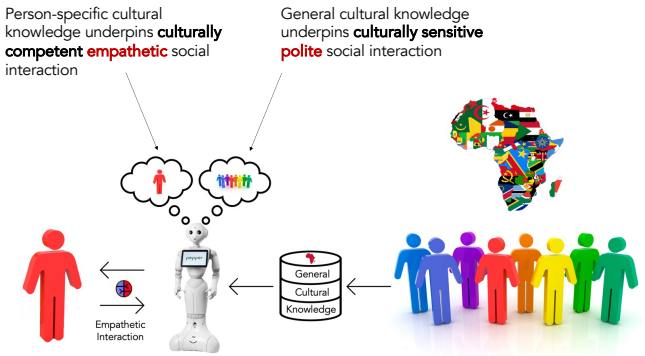
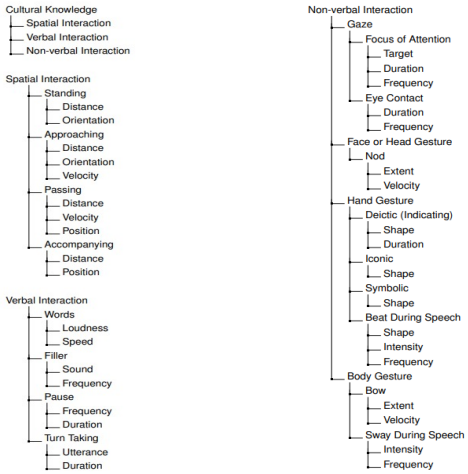
CSSR for Africa
www.cssr4africa.org

Research Goals

The CSSR4Africa project is working to equip social robots with the ability to interact sensitively and politely with people in Africa using spatial, non-verbal, and verbal modes of communication.



Cultural Knowledge Ontology

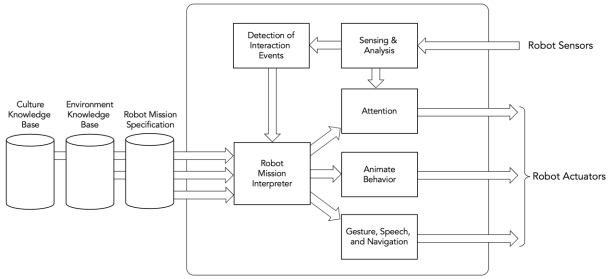


The Pepper Social Robot

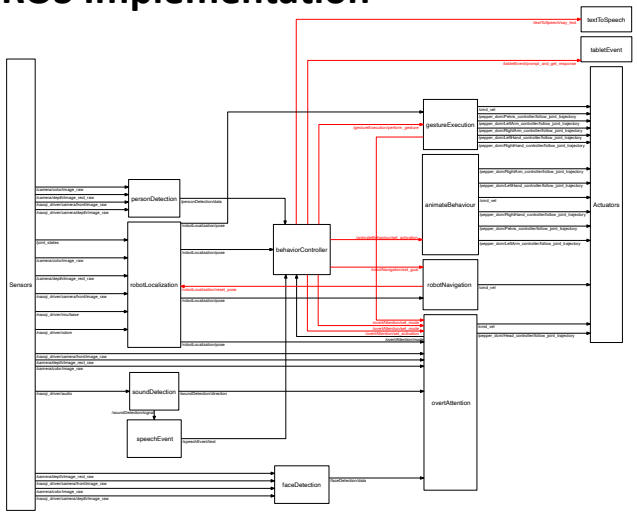
Example Cultural Knowledge

No.	Socio-cultural Norm or Trait
1	All interactions should begin with a courteous greeting.
5	To show respect, one should bow slightly and lower gaze when greeting someone older.
8	One should use an open palm of the hand to point to people and objects.
10	One should not use the left hand to point to anything.
19	One should not make persistent eye contact with an older person.
21	To show respect, one should shake hands with the right hand and use the left arm to support the right forearm when doing so.
23	One should not walk between two or more people who are conversing; it is considered rude to do so.
25	Behaviours should focus on fostering social connections and relationships; they should not be purely functional.

System Architecture



ROS Implementation



Publications

A. Akinade, D. Barros, and D. Vernon, "Biological Motion Aids Gestural Communication by Humanoid Social Robots", International Journal of Humanoid Robotics, Vol. 22, No. 2, 2025.

A. Akinade, D. Barros, M. Danso, Y. Haile, E. Birhan, B. Shimelis Girma, C. Osano, P. Ranchod, M. Richard, B. Rosman, I. Jimoh, T. Taye Tefferi, D. Vernon, "Culturally Sensitive Social Robotics for Africa", Proceedings of the 2nd International Workshop on Cultural Robotics: Diversified Sustainable Practices, IEEE/ACM HRI 2025, Springer LNAI, 2025.

D. Vernon, "An African Perspective on Culturally Competent Social Robotics: Why DEI Matters in HRI", IEEE Robotics and Automation Magazine, Vol. 31, No. 4, pp. 170-200, 2024.

A. Akinade, Y. Haile, N. Mutangana C. Tucker, and D. Vernon, "Culturally Competent Social Robots Target Inclusion in Africa", Science Robotics, 2023.

P. Zantou and D. Vernon, "Culturally-Sensitive Human-Robot Interaction: A Case Study with the Pepper Humanoid Robot", Proc. IEEE Africon, Nairobi, Kenya, 2023.

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