

Universal Hand Gesture Interaction Vocabulary for Cross-Cultural Users: Challenges and Approaches

GESTURES ARE POWERFUL

Why are hand gesture interactions unsatisfactory?

- Commands with inconsistent meanings
- Lack of standardization in commands and vocabularies
- Inadequacy of interchanged commands between domains
- Discourage widespread use and decrease consumer confidence in the technology
- Potential for misinterpretations and offenses
- Negative user experiences
- Overlooking cultural significance

The vocabulary must be suitable for users worldwide who interact by sharing the same system or space

Hand gesture interactions are everywhere

Gestures have been explored for interactive systems to build interfaces that allow the user to perform interactions more naturally

Establishing a common, **shared hand gesture vocabulary** that fosters **global standardization** for new multiexperience products and systems is essential. This will enhance engagement, understanding, and inclusivity among users from **diverse cultural backgrounds**.

GESTURES ARE CULTURALLY SENSITIVE

GESTURES ARE COMPLEX

GESTURES ARE MEANINGFUL

Challenges and Approaches for Vocabulary Design

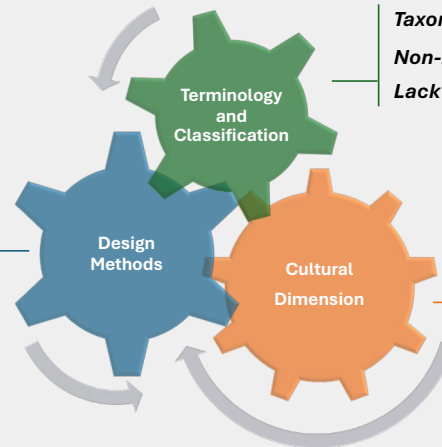
Human-based approaches focus on vocabularies suitable for the **intended user group** and cannot accommodate an outside cultural background [2].

Technical-based approach uses **arbitrary gestures** chosen based on available technology [36,25], gestures that may be stressful or impossible to perform, and the mapping of functionalities and gestures is illogical for the users [31].

User-centered design places potential users at the heart of the design process for user-defined gestures [32], e.g., elicitation studies. It is culturally focused.

Elicitation studies can face the legacy bias problem [53] in which users tend to transfer gestures they have learned from existing input devices, interfaces, and techniques to new applications.

Users prefer gestures authored by **large groups** over those that single experts proposed [30].



Taxonomy, lexicon, and vocabulary are often used interchangeably.

Non-reusable taxonomy that reinforces the deficiency of **standardization**.

Lack of shared lexicon and vocabularies.

Cultural frameworks: **Hostefe's** offers a comprehensive understanding and analysis of the pervasive influence of societal values on individual behaviour and intercultural interactions [16]. **Rubins's** for industrial designers to incorporate cultural sensitivity into product development [37]. Focus on local cultures.

Cultural insights are important for enhancing the usability and acceptance of systems in diverse contexts. However, how can cultural characteristics be accommodated for global products that jointly face cross-cultural users?

Different cultures and individuals might have different understandings and associations with particular gestures [34].

Communication and Meaning: Gestures naturally complement spoken words, enhancing the clarity of communication. They enable individuals to express a wide range of emotions, feelings, and thoughts, whether verbalized or not [21,8].



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