What Must AI Understand to Empathize?

Riset Unggulan ITB

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Abstract

Is artificial empathy equivalent to human empathy? A blind user struggling with QR payment may need assistance, or may simply wish to complete the transaction independently. Understanding this difference requires more than recognising observable difficulties.

This study constructs artificial empathy capabilities for AI as a collaborator in co-design. Field observations of three blind users and four designer–user co-design sessions were analysed to examine situated experiences and empathic interactions.

The proposed framework identifies six Empathic Understanding Aspects (EUA) and nine artificial empathy capabilities across four domains: situated experience understanding, multi-perspective understanding, evidence-grounded empathic reasoning, and empathic continuity.

Keyword: artificial empathy; empathic understanding; co-design; ai capabilities; perspective-taking.

Introduction

QR payments offer greater financial independence for blind users but introduce challenges involving nonvisual navigation, environmental conditions, and social interactions.

Observable difficulties do not always reflect users' actual experiences or intentions. Assistance may be helpful, but users may also wish to maintain independence and control.

In co-design, designers and users bring different experiences and perspectives. Developing empathic understanding requires interpreting these differences rather than merely identifying accessibility problems.

Artificial empathy offers the potential for AI to support how designers and users understand one another. However, the capabilities required for this role remain insufficiently defined.

Research Method

This study employed a qualitative approach using two complementary empirical sources:

Field Observation: Three blind users, each undertaking five QR payment tasks (15 task opportunities). A script-based analysis examined conditions, situations, critical moments, human responses, and outcomes.

Co-Design Sessions: Four designer–user dyads with varying levels of experience. Protocol analysis examined how empathic understanding developed through communication, clarification, and revision.
The analysis followed four stages:
Situated Experience Analysis → Empathic Understanding Analysis → Co-Design Interaction Analysis → Artificial Empathy Capability Construction
These stages connected situated human experiences and co-design interactions to identify the capabilities AI requires to support empathic understanding between humans.

Result & DIscussion

Field observations revealed that QR payment difficulties extend beyond technical accessibility, involving personal intentions, subjective experiences, environmental constraints, adaptive strategies, and multiple actor perspectives.

The analysis identified six Empathic Understanding Aspects (EUA), describing what must be understood beyond observable behaviour.

Co-design interactions showed how users' lived experiences challenged designers' assumptions, clarified different perspectives, and informed design reasoning.

Synthesising both sources produced nine proposed artificial empathy capabilities organised into four domains:

1. Situated Experience Understanding: Interpreting intentions, feelings, contexts, and autonomy.
2. Multi-Perspective Understanding: Recognising and connecting different human perspectives.
3. Evidence-Grounded Empathic Reasoning: Examining uncertain interpretations through evidence and clarification.
4. Empathic Continuity: Maintaining and revising understanding throughout co-design.

These capabilities position AI as a collaborator that supports empathic understanding between humans, rather than replacing human empathy or judgement.

Conclusion

Artificial empathy capabilities can support understanding of human experiences and perspectives in co-design, strengthening empathy between designers and users without replacing human judgement. This study proposes nine capabilities to interpret situated experiences, connect perspectives, and sustain empathic understanding. These capabilities provide a foundation for future AI collaborators in inclusive co-design.

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Deriving Artificial Empathy Capabilities for Co-Design

1	**Understanding Intentions** Understand the reasons behind someone's actions.
2	**Understanding Feelings** Recognise how people feel
3	**Understanding Context** Understand the reasons behind someone's actions.
4	**Respecting Autonomy** Recognise when help is needed and when independence matters.
5	**Recognising Perspectives** Understand how different people see the same situation.
6	**Connecting Perspectives** Explore differences and common ground between viewpoints.
7	**Checking Evidence** Separate facts from assumptions and uncertain interpretations.
8	**Supporting Clarification** Help people ask questions and resolve misunderstandings.
9	**Maintaining Understanding** Remember and update understanding throughout co-design.