Designing for Loneliness: A User-Centered Framework for Socially Responsive AI Companions

Anya Lu
Sam Houston State University, Huntsville, Texas

Abstract

Conversational artificial intelligence increasingly occupies social and relational roles traditionally associated with human interaction, including listening, emotional support, validation, and companionship. However, designing AI systems to respond effectively to loneliness requires a more nuanced understanding of the user need being addressed. Loneliness is not a uniform experience; individuals may experience emotional loneliness related to the absence of close attachment, social loneliness associated with limited belonging or integration, existential loneliness characterized by deeper feelings of separation, or mattering-related loneliness arising from feeling unseen, insignificant, or unneeded.

This study uses a user-centered design research approach to examine how these distinct loneliness experiences can inform the development of socially responsive AI systems. A survey will be conducted of 400 adults to assess general loneliness, emotional, social, and existential loneliness, perceived mattering and anti-mattering, baseline social support, prior AI use, predispositions toward AI, and temporal patterns of loneliness. Participants will also describe the context of their most recent experience of loneliness through an open-ended response. Quantitative and qualitative data will be used to examine relationships among loneliness subtypes, identify common experiential contexts, and evaluate whether mattering-related loneliness represents a distinct user need.

The study contributes to interdisciplinary AI design by moving beyond a one-size-fits-all conceptualization of lonely users. Findings can provide an empirical foundation for developing more user-centered AI companion interactions by identifying the different social and relational needs that designers should consider when creating systems intended to provide companionship or social support. More broadly, the research demonstrates how psychological and communication research can be translated into design requirements for socially responsive artificial intelligence.