Robot Interactive Motion Design for Enhancing Mental Well-being

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Extended Abstract

In today's society, characterized by complexity and the pervasive use of technology, individuals often find themselves under constant pressure in various aspects of life, whether at work or school. This continual stress can take a toll on mental well-being, leading to conditions like depression and anxiety. Fortunately, numerous therapies exist to alleviate these stresses, one of which involves the use of mental care robots designed to respond to human emotions. In this paper, we propose an auxiliary remedy for individuals experiencing depression, employing gestures and interactions facilitated by a robotic system. To address the emotional needs of individuals, we utilize a programmable mental care assistant robot named 'MIRO.' Unlike static therapeutic interventions, MIRO offers dynamic and responsive interactions tailored to the user's emotional state. By leveraging its array of exteroceptive sensors, including touch sensors, ultrasonic sonar sensors, and microphones, MIRO can interpret and respond to user input effectively. Furthermore, MIRO incorporates a sound localization scheme, utilizing dual sound sensors to locate and engage with users, akin to the responsiveness of a trained therapy animal. Understanding human emotions is paramount in providing effective support. We employ a valence and arousal model to categorize emotional states, enabling MIRO to adapt its interactions accordingly. When users exhibit signs of sadness or depression, MIRO employs various therapeutic behaviors aimed at alleviating distress. By mimicking the empathetic responses of a companion, MIRO enhances the efficacy of psychological counseling sessions, providing users with a sense of comfort and support. We propose using robots as emotional companions to alleviate depression. Our approach employs MIRO, a programmable robot, which adapts interactions based on user emotions, detected through sensors. MIRO's responsiveness, including sound localization, mimics therapy animals, enhancing psychological counseling effectiveness.

References

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