
Abstract

Assistive Dressing System: A Capabilities Study for Personalized Support of Dressing Activities for People Living with Dementia

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Abstract

People living with advanced stages of dementia (PWD) or other cognitive disorders do not have the luxury of remembering how to perform basic day-to-day activities, making them increasingly dependent on the assistance of caregivers. Dressing is one of the most common activities provided by caregivers. It is also one of the most stressful for both parties due to its complexity and privacy challenges posed during the process. In this paper, we present the first of its kind system (DRESS) that aims to provide much needed independence and privacy to individuals with PWDs, and afford additional freedom to their caregivers. The DRESS system is designed to deliver continuous, automated, personally tailored feedback to support PWD's during the process of dressing. The core of DRESS consists of a computer vision based detection system that continuously monitors the dressing state of the user, identifies and prompts correct and incorrect dressing states, and provides corresponding cues to help complete the dressing process adequately with minimal, or ideally no, caregiver intervention. The DRESS system detects clothing location and orientation and status with respect to the dressing process by identifying and tracking fiducial markers (visual icons) attached to clothes. In preparation for in-home trials with PWDs, we evaluated the system's ability to detect dressing events by asking 11 healthy participants to simulate common correct and incorrect dressing scenarios, such as donning shirt and pants inside out, back in front, and partial dressing, in a laboratory setting. We found that although the fiducial tracking system missed a few expected detections, it was generally capable of detecting dressing phases for both pants and shirt. Our study suggests that the use of a fiducial tracking system in the context of detecting dressing processes has the potential to automatically recognize, and generate prompts and feedback to assist PWDs or related cognitive disorders to correctly dress themselves with little or, ideally no assistance from their caregivers.

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KEYWORDS

User-centered design; Assistive technologies for persons with disabilities; Human Factors, Performance; Dementia; Context Aware Computing; Ubiquitous Computing; Sensing Systems; Image recognition.

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Multimedia Appendix 1

Images one through four.

[[PDF File \(Adobe PDF File\), 611KB-Multimedia Appendix 1](#)]

Multimedia Appendix 2

Extended abstract.

[[PDF File \(Adobe PDF File\), 488KB-Multimedia Appendix 2](#)]

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