

Wearable and Pervasive Technologies for Capturing Life Histories in a Smart Care Environment

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Overview

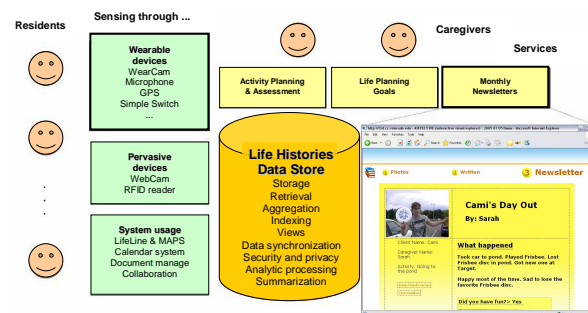
We are designing wearable and pervasive computing systems to support caregivers of individuals with cognitive disabilities by capturing **life histories** in a smart care environment.

Goal

We seek to identify and overcome conflicting design trade-offs of **creating a capture system that imposes minimum burdens on residents and caregivers, while providing interesting insights about residents' abilities, needs and preferences, and respecting individual privacy.**

Approach

Our approach is to create a **socio-technical system** through iterative assessment and redesign. A key conceptual framework for dealing with the design trade-offs is **context awareness** (awareness of location, identity, state of people, groups, computational / physical objects, etc.), which enables us to build systems that can respond to different needs and expectations. In contrast to a common approach of "capture everything and use later," we consider the context of retrieval and use in the design of capture and storage environments.



High-level system architecture that embodies our approach. The screenshot (right) shows a prototype caregiver interface for the monthly newsletter service.

Problem Statement

This research is particularly relevant in **group home environments** where turn-over rates are high and new caregivers must rapidly learn about their clients. Data collection devices such as wearable cameras and wireless sensors could **potentially be used by the caregiver network to better understand the activities, preferences, abilities and life histories of their clients.** However, certain key information is hard to capture even using advanced sensor devices, capturing any data at any time can cause privacy violations, and a massive amount of captured data may turn out to be unusable and/or useless at the time of use.

Current Status

In order to better understand the design space, we are currently analyzing the quality of information captured by small wearable cameras and microphones. This design is also considering existing work from an on-going ethnographic study of caregivers and residents. We are exploring an integrated design of wearable cameras and additional capture modalities to create a useful, privacy-preserving multimedia data store of life histories for residents living in group



Small wearable devices for capturing context: GPS receiver (top) and Camera (bottom), which can be mounted on hat or eyeglasses

home settings. Our design considers caregivers' needs to access residents' life histories by supporting automated indexing, storage and retrieval for **key activities as monthly newsletters, activity planning and assessment, and life planning goals.**

Summary

A naive approach of installing and wearing camera and sensor devices anywhere in any way may create more problems than opportunities: failing to capture what should be captured, capturing what should not be captured, and creating a large amount of unusable and/or useless data. Our research is **a step towards creating an environment that can capture, index, store, and deliver the right information to the right people (i.e., residents and caregivers) at the right time and in the right way.**



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