Thing Theory: Connecting Humans to Location-Aware Smart Environments

Sally A. Applin

Centre for Social Anthropology and Computing
School of Anthropology and Conservation
University of Kent Canterbury, CT2 7NR
sally@sally.com

Michael D. Fischer

Centre for Social Anthropology and Computing
School of Anthropology and Conservation
University of Kent Canterbury, CT2 7NR
m.d.fischer@kent.ac.uk

ABSTRACT

As architects, entrepreneurs, hoteliers, healthcare professionals and others embrace the Internet of Things (IoT) and the Smart Environment paradigms, developers will bear the brunt of constructing the IT relationships within these, making sense of the big data produced as a result, and managing the relationships between people and technologies. We explore how PolySocial Reality (PoSR), a framework for representing how people, devices and communication technologies interrelate, can be applied to developing use cases within integrated IoT and Smart Environment paradigms, giving special consideration to the nature of location-aware messaging from sensors, and the resultant data collection. Based on this discussion, we suggest ways to enable more robust messaging, and eliminate redundant messages by enlisting a social awareness of software agents applied in carefully considered contexts.

Author Keywords

Dual Reality, Mixed Reality, Blended Reality, PolySocial Reality (PoSR), Ubiquitous, Pervasive, User Experience, Agents, Time, Space, Asynchronous, Artificial Intelligence, Logic, Internet of Things (IoT)

INTRODUCTION

Each component in a location-aware Smart Environment network can generate data and send messages that must be processed, understood and responded to in some manner. PolySocial Reality (PoSR) relates the outcomes of multiplexed messaging within a group of agents to synchronous and asynchronous contexts, in particular the impact on shared understanding through overlap of messages needed for message-based communication to be effective. Sharing or overlap becomes critical in highly heterogenous environments, comprised of people from many points-of-view using a range of channels for communication in multiple languages. As humans, we depend upon successful cooperation with each other for our survival. A location-aware Smart Environment is another layer in the already highly heterogenous system of communication. People will enter location-aware Smart Environments with the expectation that their devices will integrate, their location will be incorporated, and the environment will respond to them. To plan and design effective location-aware Smart Environments, tools for integrating and responding to human needs and anticipating human intents and desires is significant.

We suggest a framework based on the agency of both humans and environmental components: Thing Theory, a logic based agent framework that evolves the discussion on how to connect humans to an environment that is designed to function for their benefit.

THING

The 1960's Addams Family television series was based on a cartoon by Charles Addams [1]. The Addams Family lived in an enormous old mansion, full of taxidermy and other curiosities, located adjacent to a cemetery near caves, quicksand, and a swamp. Thing is a disembodied hand (and forearm) that has been with the family for many years and is described as both a 'family retainer' and 'friend.' It inhabits a series of tabletop boxes in different rooms of the house that could be compared to a type of roughly cobbled physical network.

Figure 1. Thing inhabits a series of tabletop boxes.

Thing also inhabits plant pots, clocks, the breadbox, glove compartments and other devices to use as a base for interaction. Thing communicates with the family by gestures, sign language, writing out notes, or tapping out messages in Morse code. Thing serves the family by accessing a portal in contextual proximity to what is needed. Thing will answer the phone, by taking the receiver off the hook (and later replacing it), pour the tea, retrieve and deliver the mail, play castanet accompaniment to the Butler's harpsichord recitals, light cigars, return hats, offer advice, put its finger on a bow for tying up a present, or whatever else might be needed or desired at the precise moment required, in the precise room or context needed. Thing is not only a ubiquitous agent, but an anticipatory one that migrates within the environment. Although the family displays a "Beware of the Thing" sign on their front gate, Thing is shown to be courteous, friendly and helpful.

We consider the Addams Family's Thing, minus the Uncanny Valley [2] issues, as a good potential starting point for how agent behavior and interaction could support peo-