For some time now we, alongside others we work with, have criticised the ideas of intelligence that are prevalent in technological imaginaries. Working in an area loosely and somewhat unfortunately referred to as Human-Computer Interaction (HCI), we’ve given special attention to smart homes and how many of the underlying motivations driving the smart-home vision sit uncomfortably with the kinds of practices we’ve observed in our various empirical investigations of home life [e.g., Taylor & Swan 2005; Taylor, et al., 2007]. We have reasoned that it is not only a massive and sometimes intractable technological undertaking to get intelligent technologies to work in the ways promised. The very promise has been fraught with theoretical and ontological uncertainties provoked by long-standing debates around what it actually means for machines to have intelligence.¹

As an alternative to building artefacts and environments with intelligence (as in visions of the smart home), we’ve aimed instead to demonstrate through a range of examples that information and communication technologies (ICT) can be designed to enable people to act intelligently. In other words, we’ve tried to re-direct the programmatic efforts of domestic ICT design away from the possibility of intelligent things and towards an idea that privileges human intelligence.

Reflecting on our position, one resounding flaw that reoccurs to us is how the person on the street, if you will, regularly attributes life-like qualities to things and, in doing so, occasionally imbues them with intelligence. This is done without observable difficulties. People readily describe their household appliances as clever, smart and so on, and are seldom slow to refer to things as dumb or stupid. Although these phrases are not all immediate equivalents to intelligence, they are suggestive of the idea and more importantly demonstrate the capacity and indeed willingness people have to attribute inanimate things with the ability to think—even when knowing full well they don’t.

Considering the insightful points made by Edwards and Grinter [2001] on the piecemeal adoption of technology into our homes, the aversion we’ve had in our research to the idea of intelligent things pervading our environments now seems all the more restrictive. What we’ve begun to contemplate is the possibility of people gradually taking up seemingly inconsequential digital things that they see and treat as smart or intelligent—intelligent not like humans, but nevertheless intelligent in some casual, everyday sense of the word. Taking this possibility to its logical conclusion, it’s plausible to imagine many of us living in environments suffused with an ‘artificial intelligence’—living with artificial companions, if you will—but with us having reached such a point without any clear intent or thought. Alongside the technologies that will constitute our future environments, some new and no doubt unanticipated ways of making sense of intelligence will also be brought piecemeal into the home. Arguably, we’ve already started down this route. The readiness of youngsters and adults alike to care for their Tamagotchi-like devices and the less pronounced but perhaps more significant uptake of relatively simple robots like iRobot’s vacuuming Roomba [cf. Forlizzi & DiSalvo, 2006],¹

¹ These debates have their origins in the early ideas of intelligent machinery set out by Alan Turing [1950] and counter-arguments posed by Wittgenstein [Shanker, 1998].
lend support to a vision of the most rudimentary ‘thinking’ machines seeping into everyday life.

**Lessons from AI and Robotics**

With a renewed interest in the possibility of ‘thinking’ machines, we have over recent months begun engaging in various theoretical, empirical and design-oriented exercises. In our more theoretical meanderings, we’ve come to be aware that observations similar to those above as well as some important lessons can be had from casting an eye towards the developments in artificial intelligence (AI) and robotics over the last ten years or so. AI, as many of those attending the Artificial Companions forum will know, has undergone significant and dramatic changes since the 1950s when Newell and Simon laid the ground work for the project [1963]. To greatly oversimplify, a ‘New AI’ has emerged from various introspections [cf. Brooks 2002] and external critiques [cf. Suchman, 1987]. The top-down, brute force approach to computation that characterised Good Old Fashion AI (GOFAI) has been, over time, largely replaced by an AI with emergence as its trope which envisages learning as something that evolves from the ground up, so to speak.

BROADLY SPEAKING, WE’VE FOUND THESE DEVELOPMENTS IN AI TO HAVE BEEN INSTRUCTIVE ON TWO COUNTS. FIRST, AND PUTTING TO ONE SIDE THE AMBITIOUS PROJECTS FROM AI DIGNITARIES SUCH AS BROOKS [2002] AND GRAND [2003] (ALSO SEE [CASTAÑEDA & SUCHMAN, 2005]), THE EFFORTS FROM WITHIN AI AND ROBOTICS TO BUILD SIMPLE OPERATING, AUTONOMOUS MACHINES THAT ARE RESPONSIVE TO SITUATIONAL VARIABLES, INDICATES A SHIFT IN THINKING ABOUT INTELLIGENCE. NO LONGER IS IT EXCLUSIVELY ASSUMED THAT THE SORT OF INTELLIGENCE TO BE ATTAINED IN MACHINES SHOULD SIMULATE HUMAN INTELLIGENCE. MORE SUBTLE IDEAS ARE FINDING A FOOTHOLD THAT ARE LEADING TO MACHINES THAT ARE MERELY SUGGESTIVE OF INTELLIGENCE. KEY HERE IS THAT ELEMENTS OF AI AND ROBOTICS ARE OFFERING A PATH AWAY FROM A RIGID AND RESTRICTIVE NOTIONS OF INTELLIGENCE IN MACHINES AND TOWARDS ALTERNATIVE AND IN SOME CASES NEW POSSIBILITIES.

The second lesson comes more from outside AI—broadly from an ongoing and maturing critique of AI’s developments—and provides us with an interesting possibility for (re)framing the ideas we have of intelligence. An example of this critical perspective is offered in Lucy Suchman’s now well-cited book *Plans and Situated Actions* [1987]. Suchman’s thesis criticised some of the assumptions implicit in intelligent or expert systems, specifically those being designed into the photocopiers her organisation manufactured. A primary lesson those in the area of Human-Computer Interaction have drawn from this work has been to recognise the situated character of human action—that even planful behaviour is contingent on the contexts we find ourselves in. Suchman though had another major theme to her work that was given far less attention (although one she has since pursued and elaborated on in her book’s 2nd edition). As part of her critique, Suchman articulated an argument that foregrounded the constitutive nature of the human-machine intersection. That is, how both the ideas of human and machine are features of the work invested in construing the interface between them. She suggested that even the idea of human-computer (inter)action (re-)configures how humans and machines are understood.

Suchman's arguments parallel and in some cases build on a programme of work—if it can be called that—that has re-cast or reconfigured the ontological distinctions made between humans (as well as animals) and things. Latour [1993] and the Actor Network Theory corpus [Law & Hassard, 1999] offer contemporary examples. Especially relevant to our ongoing research are works around the theory of extended mind (specifically Andy Clark’s extensive contribution [e.g., Clark, forthcoming; Clark & Chalmers, 1998]) and the feminist techno-science programme spearheaded by Donna Haraway [1991] and cultural studies personalities like Katherine Hayles [2005]. Like the work from within AI, this set of positions although by no means unified, provide a way of re-imagining what machines might do (and the intelligence they might have). More importantly though
they encourage us to rethink intelligence itself. They have us reflect on not only the
\textit{figurations} [Haraway, 1991] of human intelligence, but also to take seriously the prospect
of alternative and possibly new conceptions of intelligence.

**Ongoing Investigations**

As we continue to develop our thoughts on these matters, our research will aim to
examine these two themes (and undoubtedly others). In part, they will hopefully help us
to reflect on the critical position we have propounded against intelligent technology and
specifically smart homes outlined above. In a manner of speaking, we’d like to use them
as a starting point to take intelligence seriously in a way that we, and we’d argue much of
the research in Human-Computer Interaction, has chosen to avoid.

Besides simply wanting to thoughtfully reflect on our past research, our hope is also
that we might start to build up an informed way of thinking and talking about the
prospect of intelligent, companionable machines. By allowing for a re-thinking of
artificial intelligence and the idea of intelligence more broadly, what we want to do is
begin to consider the sorts of questions we in HCI might ask when people readily
attribute life-like qualities including intelligence (and no doubt stupidity) to machines—
the kinds of questions we might ask when it is unremarkable to live with machines that
act autonomously, that converse with us (in speech or otherwise), and that even converse
with one another. Our aim is thus not only to ask how these companionable machines
might be like us and interact in ways that are familiar (as in conversation), but to ask
how they might be different. From this we might also go on to learn something of
ourselves and what it is, exactly, to be intelligent.

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