Internet memory and life after death

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Abstract: Can the digital revolution lead to permanent memorials, or even a sort of Internet-based immortality? By reviewing the nature of human intelligence, this article shows that an individual's memory and ideas cannot operate directly without the human body in which they were developed. Further, there is no meaningful way in which technology can allow indefinite access to our culture. However, our lives and actions do influence the thoughts and actions of those who are living, and the Internet can enhance this influence even after our death.

Key words: Internet, memorial, identity, artificial intelligence (AI), memory

Introduction

Biographers suggest that Alan Turing, the founder of both computer science and artificial intelligence, began thinking about the nature of computation after suffering the loss of a beloved friend in childhood (Hodges, 1992). If so, then the hope and promise of un-aging machines providing lasting comfort to the bereaved has predated and even motivated the actual construction of digital computers. But can computers or the Internet honestly give eternal memorials? How does widespread access to computation and the Internet affect what it means to be dead?

We can approach the question of eternal Internet memorials and what it means to be dead both from the perspective of the dead or dying person and from the perspective of their bereaved. Answering it requires understanding not only of the nature of technology but also the nature of human intelligence and identity. In the sections that follow I will discuss the science of human behaviour, then take a more humanist or even futurist perspective on the concrete consequences and social implications of how technology and the Internet have changed what it means to be human, and what the implications are for the processes of death and bereavement.

The questions I will address may seem bizarre to some, but can be found in technical literature as well as ordinary discourse. These are:

- Can our minds be uploaded to computers, preserving forever our capacity to think and act?
- Can our photographs or other memories and memorials be preserved digitally in perpetuity?
- Does anything of our thoughts and actions stay active in the world after our death, and if so how has the Internet changed this kind of afterlife?

In order to provide sensible answers to these questions I will first describe two things: intelligent action and human identity. Both of these are affected by memory, and memory – for contemporary humans – is affected by computers and the Internet.

Intelligence, identity and memory

Human identity is largely recognised or at least judged by our actions. Our actions are in turn determined by our thoughts, and our thoughts, while driven by goals and perceptions, are heavily influenced by our expectations about how the world works, and how we can expect to be

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able to affect it. While thought and action work roughly the same for all cognitive species (eg. dogs and monkeys, but not plants), humanity is unique in the extent to which our memory can be viewed as external to our body. We are certainly not the only species that uses external memory – for example, deer, cattle and elephants all occasionally follow worn paths to favourite destinations. The difference between externalised memory and natural landmarks is that memory is something constructed by the species, and the worn trails of these animals meet this definition.

Thus human uniqueness in our use of externalised memory is only one of extent. This memory derives from two sources: our built environment – our individual and collective possessions, and our social networks – the memories and expectations of our acquaintances. Both of these sources are related to the concept of culture, but are not quite the same. The term *culture* is normally applied to behaviour and artefacts shared across a population, but memory is usually seen as something specific to an individual. Of course, there is a relationship. Culture is composed of the collective memory of a population. But each individual's access to that culture is slightly different. Each individual perceives slightly differently, partly because of biological differences but largely because of differences in history and internal memory. Perception is an intelligent process consisting of interpreting sensation in the light of experience, and therefore the fact that each individual has their own history – their own family, their own books they've read, dreams they've had or points where they paid attention during a lecture, speech or movie – each person will perceive differently. Since perception enables or even drives action, each person must therefore act differently even if we all shared the same motivations and capabilities. Of course, in some circumstances our cultural or biological expectations are so strongly determined that almost everyone behaves nearly exactly the same way, but our individuality is born from the times we do not.

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I will continue discussing the relevance of externalised memory to identity and bereavement below. But here we have already made enough headway to answer the first question from the introduction. Perception and action depends on our expectations, which derive from our biology, our culture, our individual experience and the physical and social environment in which we live. Consequently there is no meaningful way in which a human identity can be preserved as an acting person on a computer. Human intelligence expects among other things a human body – all of our memories and skills rely on aspects of our biology we are not even aware of. Even if there were some way to 'read' the biological changes that occur when we store internal memory in our bodies, without that same body those memories would be as useful as our muscles would be without a skeleton. This is a statement of the embodiment hypothesis (Varela *et al*, 1991).

Hand-in-hand with embodiment is another concept: the combinatorial complexity of planning and action (Russell and Norvig, 2009). We do not do the things we do because we have reasoned about our actions from first principles – first principles in this domain aren't even defined, but if they were this would take far too long. Rather, we either behave reflexively, or we consider a small range of possible actions which are drawn from our memory and associated with our present context. If we were really beings of pure reason then perhaps our entire identity could be encoded on a computer, but such reasoning is computationally intractable – no such beings could exist in our universe. We instead depend on our memories, and our individual memories are based on our individual bodies.

The extent of cultural permanence

If computers cannot preserve our selves after our death, certainly they can preserve our photos, videos, letters, and any other documents we have saved in digital format. Does this mean we have a kind of immortality? Many websites have sprung up claiming to offer memorials in perpetuity, and many teenagers expect that photos they have stored on the web will be there (and theirs) forever.

In fact, historically digital systems of storage have been far more transient than paper. Traditional storage media such as magnetic tape corrode over time, but even where materials are relatively permanent, data formats and machine architectures are not. Many companies have literally found their past inaccessible in the last century when they returned to try to read old data from archived computer media. Similarly, corporations that may hold our data for us on the Internet come and go. If a company goes bankrupt, its assets become the property of those it is in debt to. Accessibility to digital 'property' can therefore be lost for legal reasons or due to simple negligence even if the media on which they are stored still works.

Of course these are technological problem, and being addressed by governments, librarians, archivists and activists. What if we assume (for the sake of argument) that at some point in the future we really were able to guarantee that we can at least view documents indefinitely, how long would we be able to read and understand them? Few English speakers can read Beowolf which is only 1,000 years old – in fact, few can even read Chaucer (1478). But 'forever' is a lot longer than a few hundred years.

The dawn of the sort of doctrinal religions popular today is only about 10,000 years ago. The longest a hominid species has persisted so far is *Homo erectus* which lasted about 1.6 million years. Our solar system is expected to last no more than another four billion years. Of course, if human culture really is a major transition in evolution as some scientists think (Maynard Smith & Szathmáry, 1995), then our culture might survive our species or even our planet. Just as single-cell organisms are still a part of the ecosystem today, our ideas in some form or another might underlie future evolutionary transitions which (if human culture is one) would almost certainly be technological. If a future machine-based system of reproduction survived our planet, and was based on our contemporary culture in the same way (and with the same amount of access) as we are based on our DNA, is that immortality? Possibly, but certainly not in the form that a teenager expects when they upload pictures of a friend to their favourite social website. Professionally, I find this entire scenario unlikely, but I raise it to illustrate the closest thing to true technological permanence I can conceive of as possible.

The persistence of identity in society

A person can only be in one place and attending to one thing at a time, so the range of direct influence of our identity tends to be limited. But when one person's identity affects another's – for example, through the other person's memories of their mutual interactions – the first person's influence has broadened. Consider how your own behaviour is affected by your expectations of other's expectations. First, your memory of a friend or enemy, what they like or dislike, affects your behaviour towards them. Secondly, the knowledge of the expectations others have about you – your family, your co-workers – affects how you behave even in relatively independent circumstances, such as choosing clothes, friends and partners. This is true for everyone, whether or not they formally write books or teach lessons, we all influence the behaviour of everyone we interact with.

Death has never served to immediately remove the influence of these memories from a society. One of the near-universals of religious behaviour is the assumption that the dead still take an interest in human behaviour (Whitehouse, 2002). This indicates that the models of an individual that are built in the minds of others during that individual's lifetime persist and continue to have influence on the world after that individual is no longer present. For some individuals, quite explicit memories in the form of stories and descriptions can be passed on even across many generations. As discussed earlier though, we can expect these memories to alter over time. Each idea or behaviour references other parts of our memory (whether internal or external) and these may become lost, obscured, changed or simply diffused as more and more information is added into our culture. Even at an individual level, our memory of past events is easily corrupted as we learn new facts and encounter new people (Roediger *et al*, 2001).

Digital artefacts change this process in several ways. To the extent that a particular media or format persists, external memory for those who have access to it no longer shifts, though perceptions of it may. This might lead us to believe our identity and influence will last substantially longer after death, even 'forever' due to the general association between computers and mathematical absolutes. However, the same societal changes that bring us this immediacy also change our patterns of relationships. The Internet brings us access to a wide variety of minds, not only those of our immediate friends and relatives. Thus in fact our influence both during life and after death may be both more direct and accurate yet also far more diffuse, diluted by our direct access to so many other external memories as well.

I would expect that the current digital revolution has made the influence of our identity immediately after our death much higher. Memories are not only preserved but transmitted between collections of people associated with a dead individual. Each associate will therefore get a brief but very salient surge of insight into the individual who is lost, and this better understanding may lead to greater influence of that individual on their bereaved's behaviour. But how long will this new influence last? The same process that allows the rallying of information about the deceased brings a constant stream of new influences every minute. Thus our 'life' or at least the less-indirect influence our identity has over living actions may actually fade sooner. Still, for some of the bereaved, both the ongoing direct digital access to these memories and the impact these have on their own internal memories may be a lasting influence on the rest of their lives. ■

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