Chapter three: Problems of temporality in the digital epoch - Yuk Hui

Introduction

This chapter focuses on the problems of temporality through a discussion of individual time and historical time, limited to questions of the future. Often here, the future is depicted as a problem but this is a problem with the limited idea of what the future can be.

Orders of temporal magnitude

Time is thought of here as a threefold temporality: past, present, and future. A few understandings of time are then given, including time as a measurement of geometry; of lived experience which is experienced as an invisible totality; and finally from the perspective of history; a past we have not lived but still weighs upon us. These are different orders of magnitude for time. These orders of magnitude are made more complex by technological mediation, making the evolution of technology pertinent to our understanding of time. Digital technology changes how we can understand time as it gives us a way of measuring time more granular than we can consciously experience: we do not hear sounds in microseconds but can measure in microseconds. However, there are objects of time which exist independent of the human mind that can be presented visually through technology. These objects are called interobjective relations here. These interobjective relations help to display that temporality is material, being hardwired into technologies which constitute time itself. Data is the core contemporary interobjective relation.

This is not to say that technology reconfigures physical time but it brings about new dynamics of the temporalisation of the past, present, and future (with the third examined here). The argument being made here is that the past and present are becoming more determined by future events which have not happened but are already there. The future exceeds what is hardwired but being hardwired is its most important condition. It then goes on to say that while death is the ultimate future for us all but that the digital epoch challenges this, making the future a metaphysical force.

The problem of tertiary protention

The combination of big data and predictive algorithms has rendered tertiary protention more visible and made the relation between man and the future more explicit than ever. This derives from Husserl's phenomenology of time-consciousness, in which he distinguishes between primary and secondary retentions and protentions. When you experience something, you retain every now because every now is no longer (by its definition of being 'now'). This is a primary retention. Experiencing the now and being able to make sense of it requires some conception of what may come next, this expectation of what is next (of the 'not-yet') is the primary protention. When you remember something you've experienced before, this is not a temporarily rendered 'now' but a recollection, making this a secondary retention. Remembering how the experience proceeds and ends also constitutes the secondary protention. The example given is of listening to a piece of music, you experience the 'now' of it for the first time, understand it through protention, then remember it as a secondary retention and protention when you hear it in your head again.

Stiegler suggests a tertiary retention (or artificial memories). These tertiary retentions are when our primary orange secondary rententions and protentions get invoked by another source e.g. an MP3 can help you remember a song you first heard on CD. Hui adds a tertiary protention as well, which is not an anticipation an actor has but a projection which is imposed upon the actor and proceeds ahead of them. In this context, he Hui is effectively

talking about digital recommendation systems or preemptive algorithms, driven by statistical analysis to try and mould future human desires and behaviours. In this tertiary protention, the future is at the present, acting as a mode of complex but mechanical repetition in which an actor's time is fragmented and reorganised by individual IoT devices.

Hui suggests we liberate time from the determination of tertiary protention through inventing new temporal organisations, utilising alternative technological architectures and algorithms. This involves a fundamental reorganisation of interobjective relations, which Hui suggests should be organised around groups rather than individuals, as these objects shape our collective imagination of the (digital) future.

The problem of the digital future

Just as personal time becomes hardwired by digital technologies, so too does historical time. This leaves us today in the synchronised time of globalisation, in which all cultures converge and a world history is articulated. This results in the pursuit of a singular humanism of the homo deus, with people like Harari pointing to a future of humanity that can be reduced to an AI which is governed by some omnipotent super intelligence. This super intelligent technology will arrive at 'us' collectively, supposedly. This suggests a universalist concept of technology, in which all technology is effectively created equally (not constrained by social, cultural, material, etc factors). Instead, the differences between nations (and their technology development) is simply framed through the lens of 'advancement'. This results in a race to reach this technological singularity, making it the defining issue of the sovereign nation state.

The point being made here is that digital studies should not limit itself to analysing only these processes but should be open to new directions for technological development, promoting diverse digital imaginaries. Hui then goes on to say that the belief in modernisation as synchronisation (via a universalist idea of technology) confuses universalism with universalisation, the latter being colonialism via technology. It is important to expose this in order to promote a plurality of technological futures and a new geopolitics alongside it.

Antinomy of the universality of technology

Imagining new digital futures requires a plurality of cosmotechnics. Cosmotechnics is defined here as the unification of the cosmic and moral orders through technical activities and is said to be the antinomy of technological universality. This seeks to challenge synchronisation through each culture developing its own history of cosmotechnics through a systematic rediscovering of its epistemologies (and their relation to the current moment).

It then goes on to talk about the origins of technics, particularly in differentiating between technē and Gestell, with the former meaning to bring forth while the latter is about enframing (i.e. everything is considered calculable and exploitable as resources). Modern understandings of technologies often fall into this latter category but this can exclude technics from non-Western cultures. This is why we need new ways of understanding technologies outside of Europe, with questions of technological futures being approached through historical and metaphysical investigations of cosmotechnics. Hui begins to do this here with the Confucianist concepts of dao and qi. They unify to situate humans as cosmological beings and lead them towards the good but this unification is dynamic, corresponding to the episteme of the epoch. 'We seek to allow multiple futures to emerge and remain irreducible to the global axis of time perceived as world history since what is called modernity'.

Chapter four: Suspending the "Time Domain": Technological tempor(e)alities of media infrastructures - Wolfgang Ernst

The nonhuman temporality of technological knowledge

Media archaeology is concerned with the hardwired structure of media but also with their operative unfolding-in-time. This makes media archaeology analysis similar to signal analysis, including the mathematical, algorithmic operations of the media. This *is not* phenomenological then but is concerned with the microregimes within technological devices. It is concerned with the implicit epistemic articulations and enunciations of infra-technical operations. Here, 'hardwired temporality' refers to infrastructuring of time by technologies and the temporal structures revealed in the techno-logic knowledge of machines. This leads to an epistemic knowledge of technical processuality beyond conventional 'time' (similar to computer vision, perhaps).

Clocking as the anonymous time base of modernity

This begins by saying current data exchange parallels the time keeping of Benedictine monks and their escapement-driven clock, with the heartbeat of the time base allowing for exact synchronisation of cycling units in data processing. This is said to be a nonhuman temporality at work within techno-logic knowledge. Again, this is not presented as new, rather it is said to fit with Heidegger's concept of the Weltbild: the quantifying and measuring of physical nature. The clock (or timekeeping as a concept) identifies such a quantification of the world. McLuhan points to the ancient Greek alphabet as conducting a similar function, technologizing the spoken word through a writing of the language and development of discrete units of speech (i.e. letters and words). Both things here (the escapement clock and the writing of the Greek alphabet) are said to have happened anonymously, making technological culture occur in anonymous temporality.

Enduring oscillations versus transient phenomena

Here it discusses how through a sound being made, there is an inevitable end, revealing the endlichkeit (temporal limit) of all physical signal events. This is true of all performances done in person and in real time. Recordings, however, present the ability to replay and so have no internal sense of ending. Signal processing of technological media brings back this temporality within media. It then talks about the beginnings and endings of electromagnetic waves, giving the example of radio waves. In this case, while radio waves may have a sense of ending on their electrophysical-event level, they also have a constructed ending based on programming decisions, creating an arbitrary cultural and media-economic ending.

The non-sense of "time" for technological analysis

Technological media know processual realities but not 'time', meaning tempor(e)alities is used from here on. Media tempor(e)alities unfold on three levels: firstly, within technologies when the micro-timing of signal transduction is needed for events to actually occur; secondly, in the human sense of the temporal experience of the media; and finally in 'deep' media temporality (logic and machine) which is separate from the cultural imaginary of history.

It then says that hardwired temporality offers some sort of relief here in moving past the idea of perceived human time to a co-originality where time is suspended, as the infrastructures here revolve around the technological event, with triggering ideas of 'time'

being a secondary outcome. Technical infrastructures are not time based then but are time-basing. Communication is the result of material infrastructures but also of events which are temporally infra-structured. We no longer have a master clock to tell universal ‘time’ but have a temporal pattern which is multiple, being made of a plurality of termini technici. It then gives some examples over the past 200 years of how timekeeping systems were synchronised through signal transmission, more or less. Media archaeology thus suggests that technological infrastructures extend from the material to the mathematical, embodied in the algorithms contained within microchips. This reflects Aristotle’s defining of time as the result of measuring movement sequentially by numbers.

Synchronisation and functional timing

Again, technology does not know metaphysical time but an ensemble of temporal operators who enforce timings via synchronisation. The synchronisation of human ‘computers’ previously has now been replaced by a cybernetic diagram of feedback circuits in which the central time control agency is a flexible form of automation. This integrates human monitoring into the automated circuitry. This defies Husserl’s retention and protention as the inner time consciousness of humans is replaced by a radically discrete temporality of counting by machines, which accommodates humans while using human produced data.

The emancipation of technical timing from natural ‘time’

Technologies ‘shape’ time, rather than being shaped by a transcendent timeline; basically, new technological developments bring new ways of telling time, which make old ways redundant. While we can still use a quartz watch (and many do), many more people rely on computer chips such as the 555 timer chip.

Temporality remains the rhythmic basis of digital culture though, structuring data processing from within. ‘Real-time’ data processing is not about being close in time, rather it represents the mathematical in-between of humans and their physical environment. The in-betweenness of digital time processing is seen in Unix time, perhaps most notoriously in the Y2K scare, which was based on the fear of Unix time not being prepared to handle dates beginning in ‘20’. This shows time (or its measurement) to be based in logic and maths for machines, rather than some sort of intuitive time. It is worth noting that hardware often uses ‘real-time’ or a physical measurement of time, while software uses a logical clock, causing a necessity for the two types of time to sync, generally through requesting time from time servers.

The fuzzy present of internet communication

Media archeology needs to take a time-critical nature into account when analysing technological communication. Time is said not to be understood in a unifying metaphysical sense but as a functional plurality of signifying incisions and intervals. In digital communication, there is no transmission in time, rather data packets are time-stamped to avoid traffic congestion. This acts to trap the human perception of the present into these time-stamps. It then gives some examples from the ethernet and arpanet of how time-to-live and ping-to-death was measured in articulations between devices. The current internet temporality renders the past as ‘historical perfect’, acting residually within the present. Even when we think we are communicating in an immediate manner (e.g. streaming or IMing), we depend upon the nonhuman temporality at work between computers. Thus, network cultures are not about time as much as they are about latency, dictated by the ultra-short retentions and protentions of the machines which relay human created data.

Time-to-live and ping-to-death

In a digital age, McLuhan's claim that the pace of electronic media changes patterns of temporal perception should be rearticulated. Time-critical processes take place in the bit transfer of the internet, which is the physical layer. This represents the interface between symbolic transfer and material channel of communication, making it the embodiment of the logics and matters implied in the term 'technology'. The function of the bit-transfer layer is to transform signals from the physical channel into information to be processed by machines. Time-critical research seeks to highlight when these signals happen.

Time-critical processes are rarely apparent in communication networks, despite our dependence upon a real-time web. IMing acts as an example in which the message of the medium is immediacy, which creates a pseudo-copresence. This immediacy is key to the web economy, replacing cyberspace with cybertime. This time-critical message of the internet necessitates a close look at its time-critical operations on a physical and logistical level. This is exemplified through ping, in which a data packet which carries a document is transferred independent of the other packets which carry the document. The time-to-live defines how long a packet can exist before it reaches its destination or is destroyed. Thus, each data packet has a given lifespan, with time-to-live being a vital time signature for the digital age. This acts as an example of how humans and machines are different in their operative signal processing, giving different tempor(e)alities.

(A)Temporalising radio

The present can only be analysed when it begins to become the past, both temporally and technologically. Media archaeology seeks the origins of technologies in part through defining the essential features of a technological system. A reduction to essential functions, elements, and parts is needed then to understand technologies. This kind of analysis looks at the recent, which is not past but is in a concealed retreat. The AM radio lasted for over 80 years almost unchanged (technologically), for example. But in becoming outdated, radio does not necessarily become a relic of history as much as it is a part of mobile communication as a technical medium. We see more radio than ever in mobile communication, even if it is not immediately recognised as such.

Similarly, wired and wireless infrastructures are becoming increasingly interlaced, rather than one outdating the other: today we see a rewiring of cities to become reconfigurable by chipsets. Electromagnetic space acts as a pulsed rhythm here, acting in a relational manner to other pulsations. Hardwired temporalities are thus not infrastructures but temporalise structuring conditions. This kind of structuring signal transfer does depend upon hardwired infrastructures of microchips though, with the hardwired and wireless networked working together to enable algorithms to operate. Algorithmic intelligence thus builds and operates through an asynchronous grid of operative temporal actions, such as compressing the movements between slots. Wireless communication is not simply a form of bridging spatial distances by electromagnetic waves between antenna and receiver anymore, but becomes primarily a function of intelligent shaping of signal events in between.

'In media-archaeological terms, computational technologies, in the very essence of both components (techné as well as lógos), consists of both "hardwired" temporality on the very infrastructural level of microchip circuitry and "soft-wired" temporalities resulting from what drives such machines: source code which concerns time-critical operations in computational languages such as assembly language'