

**sense of time**



Some things are not easily bent into simple linear description. Time is one of them. There are serious misconceptions about time, the first of which is that time is singular. Time is not just an immutable constant, as Newton supposed, but a cluster of concepts, events, and rhythms covering an extremely wide range of phenomena.

- Edward T. Hall, *The Dance of Life*

If I were to ask you, *what is the time?*, you could probably give me an exact answer. If, however, I were to ask you, *what is time?*, we'd be opening a Pandora's box of vast complications, complexities, considerations and contradictions.

- Ted Hunt, *Sense of Time*

How does the way we view time influence how we value and occupy time?

Professor Matthew Soteriou

Department of Philosophy, King's College London

### Time and our temporal perspective

As conscious beings we cannot help but occupy a perspective on reality that is temporal. No matter what we sense, think about, or do, all our experiences, thoughts, and actions are recessively framed by temporal awareness. The kind of temporal awareness that frames our conscious mental lives is one that provides each of us with a *tensed* perspective on reality – a temporal perspective centred on the present, from which one is oriented to one's past and future. It also affords us the impression that each fleeting moment of time is *successively* present, so one has the sense that what is present will become past, that what is future will become present, and that the recent past will continually recede into the evermore distant past. That, in turn, can give one the impression that time itself is continually unfolding over time – that time passes, and that it takes time to pass; that time flows like an ever-rolling stream, and that time is somehow not only the stream but also the bed into which it flows.

Many of those grappling with some of the deepest puzzles about the nature of time are concerned to uncover how much of this temporal perspective is an accurate reflection of mind-independent reality. They question whether reality is itself tensed, whether the passage of time is an illusion, and they attempt to disentangle those features of our temporal perspective that are peculiar to *our* ways of perceiving

the world. A further, related question we might ask, though, is this: which of our ways of experiencing and representing time are fixed for us – perhaps biologically determined – and which are optional and malleable? And reflecting on that question can in turn lead one to ponder the following, more practical issue: if alternative ways of representing and thinking about time are open to us, how might the adoption of those alternatives affect and influence how we occupy time?

### Temporal representation, bias and value

It seems unquestionable that our ways of experiencing and thinking about time do have a profound effect on the way we occupy time. That tensed temporal perspective on reality that we are endowed with brings with it significant asymmetries in our psychological attitudes to the past and the future. For instance, we recollect the past but not the future, we anticipate the future but not the past, we regard the future as open in a way that the past is not; and that apparent openness of the future is bound up with our sense that we are *free* agents – free to determine our own futures. So we plan for the future, but not for the past.

What is more, these asymmetries in the ways we are psychologically oriented to the past and the future strongly influence the evaluative perspectives that we take on our lives. For example, we seem to be much more disturbed by our future non-existence than our past non-existence; and in general, we tend to prefer to have unpleasant events behind us (in our past), rather than in front of us (in our future). That asymmetry in our concerns plays a significant role in shaping the way we live our lives. But does that asymmetry just reflect an

unnecessary bias on our part – a bias that is no more obviously justified than preferring to have certain objects to the left of you, rather than to the right of you?

Some have suggested that this temporal bias – our bias towards the future – is something we might be better off without. For example, the philosopher Derek Parfit suggested that if we lacked this temporal bias, we would gain a great deal in our attitudes to ageing and death. As our lives pass, although we will have less and less to look forward to, that would be offset by the more and more that we will have to look backward to. And there are other temporal biases that it has been suggested we would do well to combat, such as our bias towards the near-in-time – for example, our tendency to care more about events in the nearer future than the more distant future.

However, our thinking about time is not only influenced by the tensed temporal perspective that pervades our conscious experience; it is also heavily influenced by the natural change that occurs in our tiny fragment of the universe, such as the trajectory of the sun, and seasonal change; it is influenced by internal biological changes (the circadian rhythm) that organize the internal and external activities of our bodies around the 24-hour day; and it is also heavily influenced by the artefacts and conventions that we employ in representing time – such as our clocks and calendars.

These artefacts and conventions are certainly among those ways of representing time that are optional and malleable. They are subject to our intervention. So critical reflection on their design and function offers a way of exploring answers to the question I mentioned earlier:

if alternative ways of representing and thinking about time are open to us, how might the adoption of those alternatives affect and influence how we occupy time? Such reflection can also give rise to a design challenge: what are the ways of representing time that best serve our needs and values? And the attempt to address that design challenge falls to a more fundamental question: what are our needs and values?

### Temporal tools and temporal design

Some of the conventions associated with the most ubiquitous artefacts that we employ to represent time are so deeply entrenched in our culture and practice that we tend not to notice what is contingent in their design; and hence we tend not to reflect on, and question, what considerations should be most relevant to their design. Clocks and watches represent time by means of perceptible change, and in the design of any such artefact choices are made regarding the pace, direction, shape, scale and continuity of such change, as well as the labels, units, and divisions that are used to represent that change. The considerations relevant to such choices are, of course, not merely aesthetic. For these artefacts are not merely fashion accessories, and they are not merely depictions of time. They are temporal tools. They are tools that we use to measure time; and perhaps most crucially, they are tools that we use to help us project and coordinate our agency in an organised way, over time, and with one another.

The effective role that these temporal tools play in facilitating interpersonal coordination (across continents and across decades) might lull one into assuming that in the use of these artefacts we have converged on an 'objective' way of representing time, and that

they therefore offer a way of representing time that is 'neutral', in the sense of being free from any temporal bias. However, that assumption can and should be challenged, for the aforementioned choices made in the design of these temporal tools may reflect implicit and unquestioned biases. Alternatively put, those choices might reflect values that can be questioned, and/or they might fail to serve effectively other values and needs that should be prioritised in temporal design. When it comes to the question of the design of our temporal tools, we might of course conclude that there is no one design that can adequately serve to help us structure the way we occupy time given what we value, because our needs and values are many and varied. But that in itself may serve as a reminder to be wary of the constraints imposed by any one temporal design.

The challenges posed by questions of temporal design, in many ways reflect the challenges posed by some of the deepest, most puzzling and important questions about the interdependencies between the ways we represent time, and the shape we give to our lives by exercising our agency. On the one hand, the way we experience and represent time has a profound effect on the evaluative perspective that we take on our lives, which is to say our temporal perspective on the world has a profound effect on what it is that we value. But on the other hand, reflection on what it is that we value can prompt us to question and modify how we represent time; and a critical exploration of the choices we make in temporal design can help us to trace out, question, and probe these tantalising, and often obscure, interdependencies between the ways we represent time, what we value, and the ways we choose to occupy time.

Professor Matthew Soteriou



## On Redesigning Time

You have the watches, we have the time.

- Afghan Proverb

We often confuse time with the measurement of time. Or more specifically we confuse the imperceivable and multilayered non-unitary values of temporality with the perceivable unitary values of watches and clocks. Our current representations of time (visually symbolised by the clock face and conceptually organised within the social construct of Coordinated Universal Time) is seemingly a perfect reflection of our lived experience of time. Yet this representation offers a narrow lens into the vast spectrums of time, it is far from an absolute reality of time – for we are still only beginning to comprehend what that reality might be.

Cognitive Neuroscientist Virginie van Wassenhove has observed that, *'Time perception is not a unitary phenomenon, in many ways you are your own clock.'* The following designs are an endeavour to articulate and actualise an extended visual language towards a non-unitary perception of time. They attempt to act as a conduit that helps us to consider unanswered questions, hidden implications and disregarded interdependencies. Such new perspectives might begin to open new ways to understand the nature of time, and by association understand our own place within time. Time as we know it has been designed, and so it is entirely feasible that it might be redesigned.

Ted Hunt

Somerset House Studios

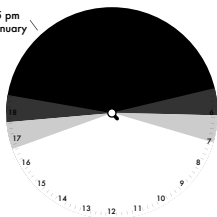


# 10 temporal tools

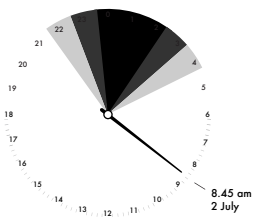
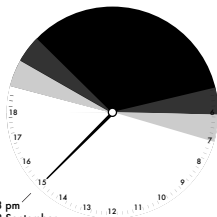
Animated and annotated versions of all designs can be viewed at:  
[senseoftime.info](http://senseoftime.info)



9.25 pm  
1 January



3 pm  
8 September



## Diurnal



Wear OS

**Temporal Tool:** A view of time that surfaces the daily and seasonal fluctuations between the clarity of day and the mystery of night.

**Affordances:** Regulating circadian cycles / treating sleep disorders / treating seasonal affective disorders.

## *References & Inspiration*

Did you ever think that perhaps our minds are delicately calibrated between the known and the unknown? That our souls need the mysteries of night and the clarity of day?

- Dave Eggers, *The Circle*

Time moves in its own special way in the middle of the night. You can't fight it.

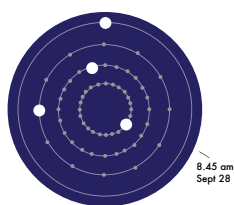
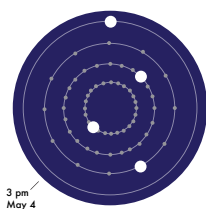
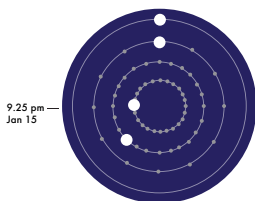
- Haruki Murakami

For millennia before clocks, our only regular way of measuring time had been the alternation of day and night. The rhythm of day followed by night also regulates the lives of plants and animals. Diurnal rhythms are ubiquitous in the natural world. They are essential to life, and it seems to me probable that they played a key role in the very origin of life on Earth, since an oscillation is required to set a mechanism in motion.

- Carlo Rovelli, *The Order of Time*

We have been conditioned to think of the darkness as a place of danger, even death. But the darkness can also be a place of freedom and possibility, a place of equality. We have much to learn about unknowing. Uncertainty can be productive, even sublime.

- James Bridle, *New Dark Age*



## Celestial



Wear OS

**Temporal Tool:** A design for time that reinforces the cyclical nature of time's passage, from the temporally-micro of 24 hours to the temporally-macro of 250 million terrestrial years.

**Affordances:** Aligning with natural cycles / establishing daily and seasonal routines and pattern recognition / acknowledging a far longer contextual view of time (the long now / deep time).

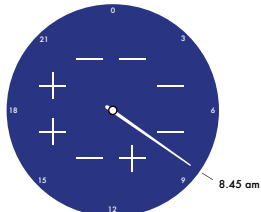
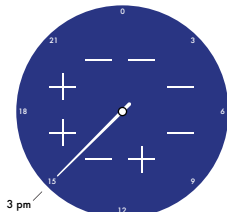
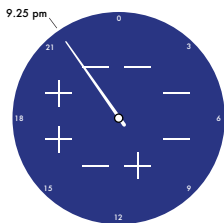
## *References & Inspiration*

I cannot imagine the future, but I care about it. I know I am a part of a story that starts long before I can remember and continues long beyond when anyone will remember me. I sense that I am alive at a time of important change, and I feel a responsibility to make sure that the change comes out well. I plant my acorns knowing that I will never live to harvest the oaks. I want to build a clock that ticks once a year. The century hand advances once every 100 years, and the cuckoo comes out on the millennium. I want the cuckoo to come out every millennium for the next 10,000 years.

- Daniel Hillis, The Long Now Foundation

Time, at its most objective, is measured against the changing celestial orbits and rotations of the planets. This is the foundation of time as we know it. Days, noons, midnights, months, seasons and years. The rotation of the Earth on its axis defines 24 hours of a day, a full orbit of the Moon around the Earth defines a calendar month, and a complete orbit of the Earth around the Sun defines a year. We can further contextualise our own place in time against the heavens by considering that the Sun is in turn orbiting the galaxy, and that this orbit takes a staggering 250 million terrestrial years to complete (known as a Galactic Year). This view of deep time not only punctuates our remarkably rapid progress in such a contextually short space of time, but illustrates the fragility of the tiny window of opportunity for conscious life within time.

- Ted Hunt



## Kairos



Wear OS

**Temporal Tool:** A design for time illustrating the influence of our biological circadian rhythms upon our lived daily experience of time.

**Affordances:** Consciously navigating and increasing monochronic productivity.



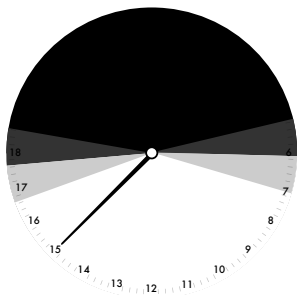
## *References & Inspiration*

The ancient Greeks had two words for time: Chronos which refers to chronological or sequential time, and Kairos which signifies the proper or opportune time for action. While Chronos is quantitative, Kairos has a qualitative nature.

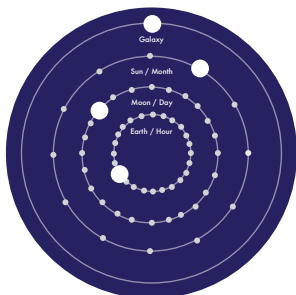
- Wikipedia, Kairos

In general, people move through the day in three stages: a peak, a trough, and a recovery. And most of us move through it in that order. During the peak, which for most of us is the morning, we're better at analytic tasks. That's when we're most vigilant, when we're able to bat away distractions and concentrate deeply. During the trough, which for most of us is the early-to-mid-afternoon, we should do our administrative tasks – answering routine emails, filling out expense reports. And during the recovery, which for most of us is the late afternoon and early evening, we're better at insight problems. Our mood then is better than during the trough. And we're less vigilant than during the peak. That looseness – letting in a few distractions – opens us to new possibilities and boosts our creativity. The trouble is that often we don't do the right tasks at the right time. We think questions of “when” are less important than questions of “what,” “how,” and “who”.

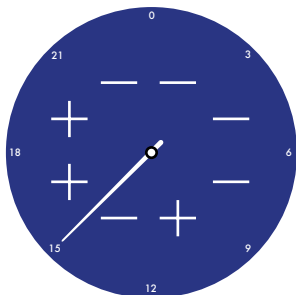
- Daniel Pink, *When: The Scientific Secrets of Perfect Timing*



Diurnal



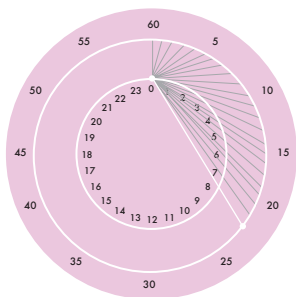
Celestial



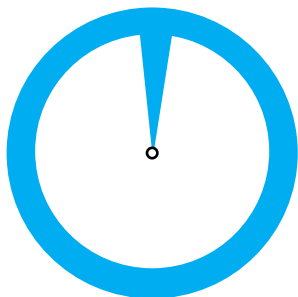
Kairos



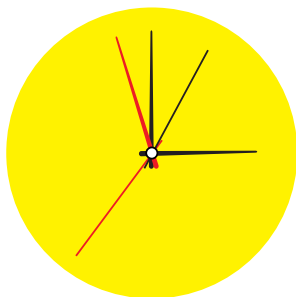
Anticlockwise



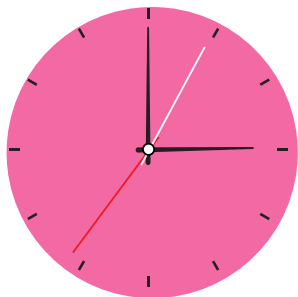
Repetition



Closure



Solar

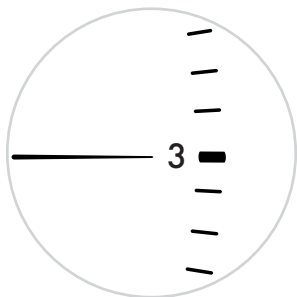


Latency

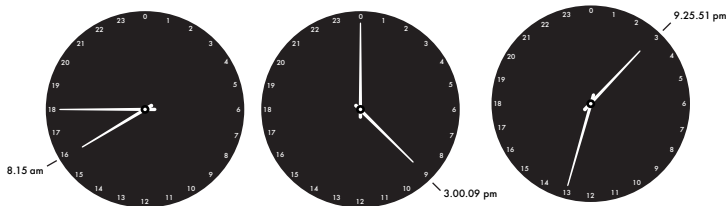


Andante

Tempo



Localised



## Anticlockwise



Wear OS

**Temporal Tool:** A design for time that challenges presuppositions regarding time's direction and impositions.

**Affordances:** Breaching the perceived unlimited nature of time associated with counting upwards (to infinity) and replacing it with a humility of time's essential limitedness of counting downwards (to the finite).

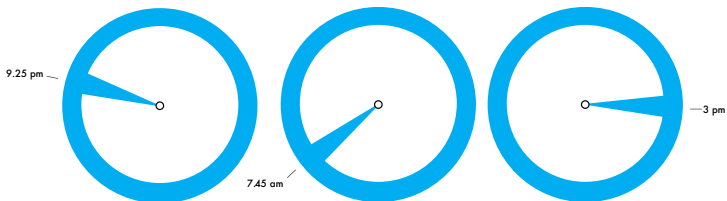
## *References & Inspiration*

The clock on the facade of the building housing the Bolivian Congress in La Paz has been reversed. Its hands turn left and the numbers have been inverted to go from one to twelve anti-clockwise. Bolivian Foreign Minister David Choquehuanca dubbed it the “clock of the south”. He said the change had been made to get Bolivians to treasure their heritage and show them that they could question established norms and think creatively. “We’re in the south and, as we’re trying to recover our identity, the Bolivian government is also recovering its sarawi, which means ‘way’ in Aymara” Choquehuanca said. “In keeping with our sarawi – or Nan, in Quechua – our clocks should turn to the left. Who said clocks always have to run the same way? Why do we always have to be obedient? Why can’t we be creative?”

- [bbc.com](http://bbc.com), Bolivian Congress clock altered to turn anti-clockwise

We hear much, said the Hegelian professor, reading from a notebook in his usual dry, hurried tone, of the influence of the sixteenth century upon the nineteenth. No philosopher, as far as I am aware, has studied the influence of the nineteenth century upon the sixteenth. If cause produces effect, does effect never induce cause? Does the law of heredity, unlike all other laws of this universe of mind and matter, operate in one direction only? Does the descendant owe everything to the ancestor, and the ancestor nothing to the descendant? Does destiny, which may seize upon our existence, and for its own purposes bear us far into the future, never carry us back into the past?

- *The Clock That Went Backward*, Edward Page Mitchell, 1881



## Closure



**Temporal Tool:** A design for time that broadens our appreciation of non-numerical values of time.

**Affordances:** Decoupling the value of time from purely numerical and unitary values.

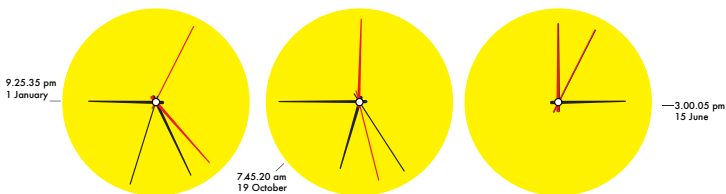
## *References & Inspiration*

For over 2,000 years we have believed in the possibility of a single true account of the world. Now this age, the age of truth, is coming to a close. Instead of seeing the world as a thing, a universe, whose truth we might uncover through the procedures of science, we might instead regard the world as open and it is we who close it through our stories.

- Hilary Lawson, Closure - A Story of Everything

The thing be say, in olden days, before before, music was a live thing! E go respond to life you no fit contain am! E no sweet for ear. Wetin happen be sey industrial revolution come come. People dey obsessed with time schedules, producing identical things, they started capturing music to put for boxes, to package time. But Africa, we no gree oh! That's reason why we say we'll come at one o'clock, but no go reach till three. Time cannot contain us. The padlock does not work! It's not the African way. No be true?

- Inua Ellams, Barber Shop Chronicles



## Solar



**Temporal Tool:** A design of time that returns to the source of temporality at its most apparent.

**Affordances:** Embodiment of a greater degree of relaxed fluency towards time keeping.



## *References & Inspiration*

Solar time is a calculation of the passage of time based on the empirical position of the sun in the sky. The fundamental unit of solar time is the day. Apparent Solar Time is based on the observed motion of the true sun as seen from a single location on Earth, and can be crudely measured by a sundial. Due to a combination of the tilt of the earth's axis and varying speed of the earth's progress on its elliptical path around the sun, apparent solar time differs by up to fifteen minutes from the time shown on a clock which measures mean time – an average of these variations.

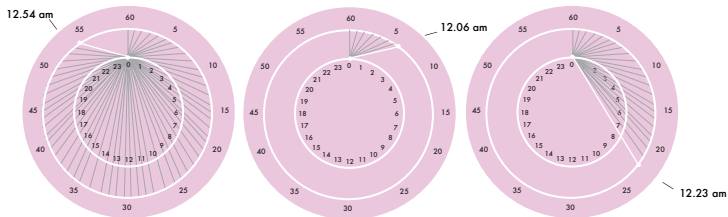
- Wikipedia, Solar time

Equation tables enable clocks and watches to be set using sundials as they convert 'true' solar time (sundial time) to 'mean' solar time (clock time). These two systems coincide four times a year on 14 April, 15 June, 1 September and 25 December.

- British Museum

The sun is God.

- JMW Turner, on his deathbed, 1851



## Nonrepetitive Repetition



Wear OS

**Temporal Tool:** A design for time that manifests the enduring patterns between free-will and continuity.

**Affordances:** Heightened self-reflection / increased bias for a past-orientated perspective over a future-orientated perspective.

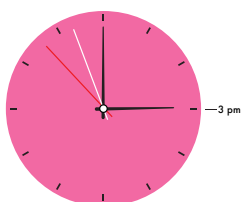
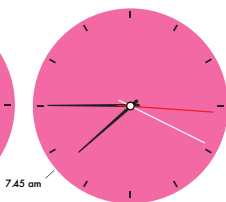
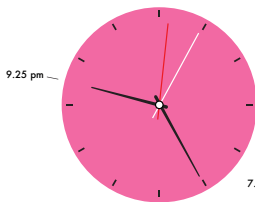
## *References & Inspiration*

There is no such thing as repetition. Human beings cannot repeat. Every time you do something, you're in another state of mind. By the end of the piece, when something is repeated, you've gone on another journey — your eyes are different, your hand is different. It's almost like what happens in life. Falling in love at 16 is different to when you're older. You never repeat yourself, ever. And Pina never repeated herself.

- Julie Shanahan, dancer, Tanztheater Wuppertal, 1988 - 2015

To exist, change must be perceived as either temporary or minor. Every day will always be different from the last, but this difference must be experienced as a continuation to some continuity. Every day, the everyday must be Groundhog Day.

- Jack Self, Real Review 7, Critique of Everyday Life



## Latency



Wear OS

**Temporal Tool:** A design for time that questions the influence of progress and acceleration upon time.

**Affordances:** A lowered latency in perception of temporality / increased appreciation of time's natural latency.

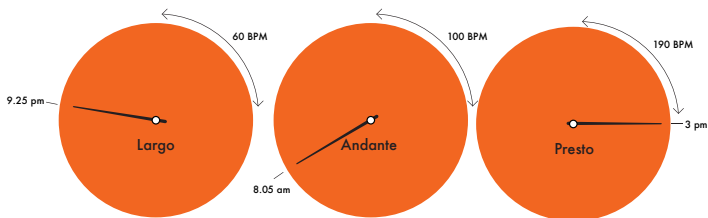
## *References & Inspiration*

We have in our time released a totally new social force — a stream of change so accelerated that it influences our sense of time, revolutionizes the tempo of daily life, and affects the very way we 'feel' the world around us. We no longer 'feel' life as men did in the past. And this is the ultimate difference, the distinction that separates the truly contemporary man from all others. For this acceleration lies behind the impermanence – the transience – that penetrates and tinctures our consciousness, radically affecting the way we relate to other people, to things, to the entire universe of ideas, art and values.

- Alvin Toffler, *Future Shock*, 1970

Latency is defined as the delay between the input into a system to reaching the desired output. The achievement of 'low latency' has become the organising idea of progress in both computing and communication. In order for humans to adapt to the lowered latency world of technologically driven processing we might begin to measure the 'third'. A second is named as such because it is the second division of the hour, the first division being the minute. A third would logically be a faster measure of time should we wish to adapt to and compete with the continually lowering latency of technologically driven time.

- Ted Hunt



## Tempo



**Temporal Tool:** A design for time that enables a greater degree of plasticity to temporality.

**Affordances:** Enhanced polychronic understanding and embodiment.

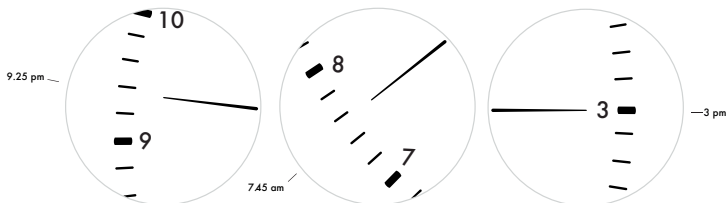
## *References & Inspiration*

In musical terminology, tempo is the speed or pace of a given piece and has its own dedicated language of variables.

- Wikipedia, Tempo

Musical tempo can be consciously slowed and quickened according to specific musical notation or a conductor's instruction. Tempo is a key facet in the temporality of music, and an attribute that the temporality of time lacks. Tempo is, however, a vividly experienced feature of our individually perceived passage of time. Our experience of the tempo of time can lead to extreme anxiety and agitation when time feels to be rushing us, or serene harmony and balance when time feels to be slowed, or indeed non-existent.

- Ted Hunt



## Localised



**Temporal Tool:** A design for time that reframes and reduces the local relativity of time's present moment.

**Affordances:** Increased focus in attention and concentration / appreciation of times plurality.



## *References & Inspiration*

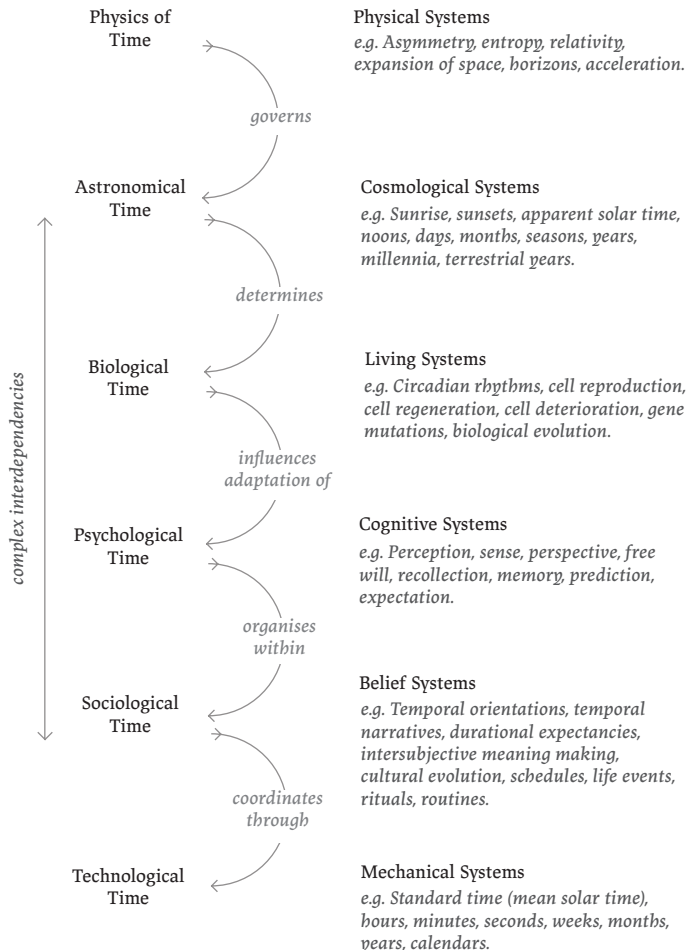
Temporality in the universe is more like a patchwork of local temporalities and there's no such sense in a global present for the universe. This is surprising, shocking, and counter-intuitive, but it's a fact of nature. It's like the Earth that looks flat to us, but it's not, it's round. Once we digest this, that's fine. There's nothing dramatic in the absence of a universal 'now', but it's hard to adjust our intuition.

- Carlo Rovelli, Temporal Complexity, New Philosopher #22

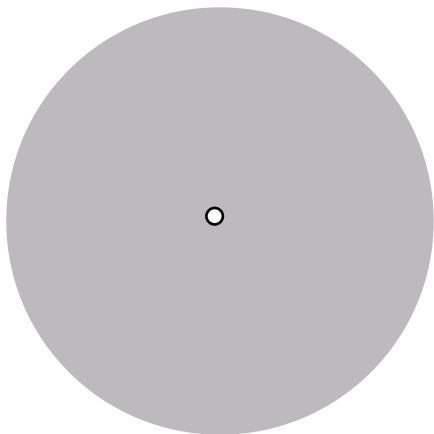
We know that on Earth other species work to different beats. Insects are fast-moving and fast-thinking. Plant life is painfully slow to our senses, but if you've ever watched a timelapse movie of plants growing, feeling, exploring, it's pretty obvious that they're up to all kinds of mischief under the cover of a different timescale. Interesting things could be happening on much more modest physical scales. For example, could the messy chemistry we see in fossil fuels on Earth – a smorgasbord of organic reactions, a seemingly tarry chaos – be simply a short-term view of a living system that functions across hundreds of millions of years?

- Dr. Caleb A. Schar, Life Unbounded

## Deconstructing Time



## *Reconstructing Time*



How would you redesign time?

Would your design divide and value time numerically, or divide and value time symbolically?

What things that you value / value doing with your time would your design allow you to better synchronise with?

How often would your design observably change (tick), and how often would it turn full circle and repeat itself?

How would your design help you to view, value or occupy time differently from the current standard view of time?

## Acknowledgements and Credits

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x



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Technology Partner  
Ticwatch by Mobvoi

Lead Academic  
Professor Matthew Soteriou

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Studio Wayne McGregor  
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Somerset House Studios

### Conversational Contributions & Input

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