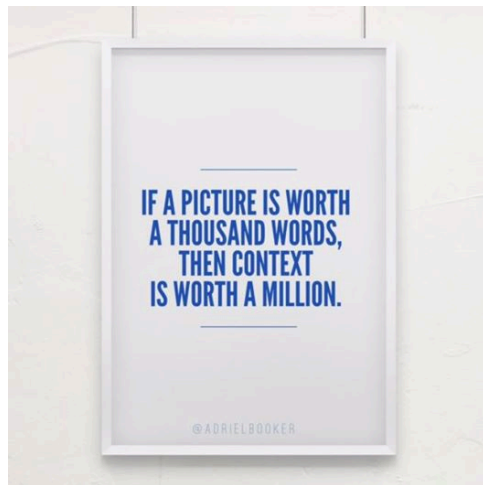Panel 3. Context Engineering
[15:50 - 17:50 on 1 October 2015]
Moderator: Carl H Smith
Participants: Masahiko Inami, Adrian David Cheok (tbc), Mark Farid, Brigitta Zics, Daniel Pinchbeck, and Luke Robert Mason.

Context Engineering aims to transform patterns that are leading to individual, societal and ecological disaster. We wait for someone to bring change without thinking that it is necessary to change ourselves. Most contexts are completely compromised unless we establish them in the first place. The power to rapidly shift our perspective is becoming a new form of currency: The ability within one field of view, to be both in the world and to see yourself in it, the power of looking through and occupying, your own field of vision (Gibson, E. J. 2006).

Virtual reality might be the most important public health issue we have ever faced due to its ability to mould our brain function in such rapid and profound ways. It could be the key to either unlocking our potential and discovering hyper abilities within all brains…or to devolving us (Roach, J. 2015). Hybrid technologies arguably present us with the largest design problem we have yet encountered.

Hybrid technology can directly shape how our brains interpret and experience reality. Greater immersion (involving all the senses) will lead to entirely new states of awareness. The game 'Blood Sport' increases the sense of immersion by removing actual blood from your body in the physical space whenever you get hit or killed in the virtual space. Context Engineering only actually occurs when that blood is then donated, to activate the societal benefit. This example provides a potential working definition for Context Engineering: when the content introduced has the power to completely augment the whole context then Context Engineering is achieved.

Virtuix Omni is a video game accessory that provides an immersive, full-body virtual reality experience. All physical actions are replicated in the game with audio, visual and even touch senses replicated virtually. "Pre virtual reality, our ideas lived exclusively in our heads, or were portrayed via some form of abstract rendering (writing or visual media). Post virtual reality, our ideas; visualisations and simulations will increasingly be delivered as direct sensory experiences that our brains will interpret as the raw data of life. We could even take that a step further and explore how virtual reality and video games might be used to mould the physical substrates of brain function to help individuals with more serious hard-wired brain problems (e.g., Autism, PTSD etc). For instance, virtual reality might help us to identify the exact point at which brain function fails within a given individual – and then create experiences that exercise that circuitry extensively, potentially helping the brain to re-wire itself. The power of these tools has not yet been fully understood or explored." (Roach, J. 2015)

The practice of Context Engineering produces 'experience coders' who manufacture content as direct sensory experience (context). One of the core concerns of Context Engineering is whether we can gain a significantly greater capacity to develop and influence our brain function and crucially if that will then help us to better understand the reality that the brain creates. As a result there is an ethical

responsibility to context engineer with as much knowledge of the affordances and dangers of these technologies and techniques as possible.

This panel session on Contextual Engineering will investigate hybrid technologies and techniques that combine the affordances of the analogue with the digital to enable a new era of Hyper Function, Sensory Augmentation and Perceptual Adaptation. Context Engineering will give us new abilities, control over our senses and the ability to develop new forms of perception, providing us with a new type of self-control. HCI that relies predominantly on vision alone or the engagement of a limited range of senses can cause individual (and by implication - societal) dissonance creating a diminished rather than an augmented reality. To counteract this, making more of the context available for human centred augmentation is crucial.

Context engineering creates a new economy where we focus less on transforming content (as the primary activity), and more on how we can make our own perception the 'content'. This is made possible by new advances in various fields including biotech, neuro-electronics and mixed reality technologies meaning that the lenses through which we experience the world are becoming more adjustable than ever. Products are being developed to intentionally manipulate various components of our own physiology. For instance f.lux modifies the computer's display colour wavelength to shift with the natural external light, reducing potential circadian rhythm problems that can develop from using devices at night. These subtle shifts can produce real changes in our bodies. Other examples and applications of context engineering include:

New auditory systems:
The 'Listen Carefully' project involves a technological intervention that considered the human condition as a central part of the design. Due to the repackaging of music in digital form one of the major results is the lack of focused listening. To counteract this the listener has to remain still to avoid the volume being automatically lowered by the headphones. The principle of conditioning is therefore employed to engineer the appropriate contextual behaviour from the listener. The experience of the content (music) is transformed by the context (our behaviour).

New visual systems:
The 'FlyVIZ 360' headset transforms the real time visual system of users by compressing the 360-degree view into a 180 degree visor creating an entirely new way of seeing. The brain only takes 15 minutes to adjust and then this new way of seeing is 'accepted as normal' without nausea. Eyesect is a wearable interactive constellation that creates a disembodied experiment using immersion. Two handheld cameras capture the surrounding context and stream the image data straight to the single eyes. Arms and fingers become eye-muscles and create impossible human-biological perspectives.

Combining senses:
'Aromafork' creates a cross-fertilization between taste and smell, re-engineering the two kinds of sense space. By releasing aromas as you eat the device augments the brain into perceiving aromas on top of the tastes which tricks us into experiencing enhanced flavours.

Adjustable senses:
'Wristify' developed by MIT is a thermoelectric bracelet that regulates the temperature of the person wearing it by subjecting their skin to alternating pulses of hot or cold, depending on what's needed. This is an example of a perceptual technology, which works on how locally heating and cooling different parts of the body effects how hot or cold we are. This is an example of the virtual inscribing the physical where the inclusion of air conditioning within architectural design may no longer be required.

Wearable Experience – Carl H Smith
The newly funded Horizon 2020 project: '[WEKIT] Wearable Experience for Knowledge Intensive Training' will use the latest in wearable and motion tracking technology to create 'wearable experience' - an entirely new form of media. This will be achieved by building a system for exploring, preserving and retrieving tacit knowledge that resides in collaborative activities conducted in mixed reality settings. Such a system represents the next step in mixed reality-based working and learning, giving access to the knowledge that is usually hidden and too fluid for being captured and re-experienced.

Sensing presence - Brigitta Zics

This presentation will outline an ecology of human experiences that teach us how to design technologies that are aware of our presence. These technologies are deeply rooted in human ontology utilising an understanding of our visceral and intrinsic nature. The notion of 'Naked Experiences' refers to technologies that are constructed to make us aware of the way we experience. Utilising the body as an interface for conscious and unconscious action these instruments facilitate an awareness of the self and create alternative challenging ways of how we perceive the world and ourselves. Technologies that facilitate the enactment of self-realisation have the potential to capture human presence. Naked Experiences represent an evolution in the human-machine relationship enabling us to access yet unknown capacities of our human condition. This can fundamentally facilitate change in the meaning of our existence as we become instrumentalised by future technologies.

BioAgency - Luke Robert Mason

Luke Robert Mason (Fourth Culture Co.)will explore how the human brain and body is being reimagined as a platform for a wide range of innovative new technologies that look set to change the way in which we think about the limits of our sensory and motor functionality. He will share what we might be able to learn from the innovators, cyborgs and bio-hackers who look set to blur the lines between biology and technology as we enter an age that some are already categorizing as 'Humanity 2.0'.

Dissolving identity – Mark Farid

'Seeing I' examines the identity of the individual and whether it is possible to subvert it. The project seeks answers to whether who we are is a cultural identity, or whether there is an inherent self. To do this a subject will wear a virtual reality headset seeing, hearing and replicating the experiences of the other from first person point of view for 24 hours a day, for 28 days. Crucially to immerse himself further into the context where identity may be subverted the subject will simultaneously do whatever 'the other' does.

Empathy Engines – Daniel Pinchbeck

The Silicon Valley, libertarian, corporate-sanctioned ideology of the technology Singularity proposes an onrushing technological evolution within the prevailing system of domination, control, and surveillance. This is the wrong direction. We should, instead, apply technology, rationally, to supersede or overthrow this unjust system, in a coordinated act of universal emancipation. This requires a new synthesis, a hybrid of elements of corporate capitalism, anarchism, direct democracy, and deep ecology. We need to attain a new level of wisdom that incorporates indigenous design philosophy into our planning for the future. I would see establishing a social design model, creating a template for it and a social network for cooperation and rapid innovation, to disseminate globally, quickly. The way to do this is to develop a template for local communities to become self-sufficient, resilient, and shift to a new form participatory decision-making.

Questions to be addressed:

To what extent can content create context? How important is immersion for over coming and subverting the human condition? How adaptable is our perception? How neuroplastic is the brain? What are the biological risks? How can hybrid technological devices, of often-prosthetic alienation, help us to reconnect to ourselves and to the surrounding environment? How can we find an appropriate balance in this hybrid environment? How can we draw a structure, ethics and sustainability of interdisciplinary hybrid unification?