Context Engineering Experience Framework

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1. INTRODUCTION

Context Engineering (CE) is a new paradigm where we focus less on transforming content (as the primary activity), and more on how we can make our own perception the 'content'. This means that the lenses through which we experience the world are becoming more adjustable than ever.

CE considers the broad spectrum of what augmentation can do but also highlights the dangers of focusing solely on the technology. The initial research is developing the theoretical background and a vast array of CE examples in order to systematize a framework, a methodology, and requirements.

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 and societal exploration. 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/hybrid centred augmentation is crucial.

2. THE WEKIT PROJECT

The newly funded Horizon 2020 project '[WEKIT] Wearable Experience for Knowledge Intensive Training' (http://wekit.eu/) will use the latest in wearable and motion tracking technology to create 'wearable experience' – an entirely new form of media where we can embody other contexts.

The latest developments in the TransTech (Transformative Technology) community (Siegel 2016, www.consciousnesshacking.org) and in 'Mutualistic Systems Design' (Jeremijenko 2016) will be discussed. These disciplines represent different types of CE.

Products are being developed to intentionally manipulate various components of our own physiology. For instance flux 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.

The workshop will investigate hybrid transformative technologies and techniques that intrinsically combine the affordances of the analogue with the affordances of the digital to enable a new era of Hyper Function, Sensory Augmentation and Perceptual Adaptation. Neuro-stimulation interfaces such as the Thync device (Thync 2016) alongside mind-controlled drones, bionic hearing, body swapping and out of body simulations will be explored.

Hybrid technology can directly shape how our brains interpret and experience reality. Greater immersion (involving all the senses) will lead to entirely new perceptual states. 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. CE only actually occurs when that blood is then donated, to activate the societal benefit. This example provides a potential working definition for CE: when the content introduced has the power to completely augment the whole context then Context Engineering is achieved.

CE tools enable us to re-imagine what already exists by using perspective to shape reality instead of changing reality itself. For instance we can now re-configure our own perceptions of beauty via helmets that are fitted with interchangeable concave and convex lenses. These shrink, expand and distort the users' features (http://theendofbeing.com/2009/12/26/hyungkoo-lee-objectuals). New forms of perception and new ways of knowing (with their own fields of application and adaptation) that are entirely different to what we have known through everyday content consumption are being born.

"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 2015).

The practice of CE produces 'experience coders' who manufacture content as direct sensory experience (context). One of the core concerns of CE 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.

3. ELEMENTS OF THE FRAMEWORK

Elements of the CE framework include:

New auditory systems: Doppler Labs 'Here buds' re-adjust audio in real-time, with no latency. The earbuds give the user a fully context engineered experience through an active listening system that changes the way we experience live audio, for instance allowing 'bass to be turned up at a gig'. They also allow the user to remove certain sounds while leaving others intact and therefore this 'hearable' allows the user to explore the world in an entirely new way. Bionic hearing is not content engineering but first hand experiential CE. The 'Listen Carefully' headphones represent a technological intervention that considers the human condition as a central part of the design. One of the symptoms of the digitisation of music is the resulting lack of attention and focused listening. To counteract this the intervention forces the listener to remain still or the volume is automatically lowered. 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: Eyesect is a wearable interactive that creates a disembodied experience. 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 exploring a whole new range of experiences.

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.

Questions to be addressed: In this session we will discuss hybrid transformative technologies to enhance our perception and help us see, hear, and feel our environments in new and enriched ways. The following questions will be explored. 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 that pushes but respects the human condition? 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 of CE? How can we find an appropriate balance in this hybrid environment?

4. REFERENCES

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