

The End of Things.

Mike Phillips and Gianni Corino.

Abstract: Just as the ‘thing’ gets its own Internet its significance as a foci of knowledge within a variety of disciplines is dissolving. This dissolution can be clearly seen in microbiology where there has been a steady shift of focus from solitary bacterium to an understanding of quorum-sensing in bacterial communities. At a larger scale, a fly is no longer recognised as a ‘body’ but through an analysis of its DNA and a human more clearly understood as a constituent of a crowd, a demographic or an entry in a National Health Service database. Architecture collapses in importance in the context of the complexity of the urban environment, whether it is the connecting temporal tendrils of traffic flow or an underlying web of a sewage system.

‘The End of Things’ explores a set of technologies and processes being developed by i-DAT that offer strategies for understanding these trans-scalar shifts. Framed as ‘Operating Systems’ they embrace social, biological, architectural and ecological data harvesting and manifestation. These OS’s recognise a cultural shift where suddenly a rose by any other name is less significant than the complex temporal.

Keywords: architectural; biological; ecological; IoT; Operating Systems; social; sonifications; thing; visualisations.

That which we call a Thing by any other name would...

“Andre, the practical scientist who never allowed theories or daydreams to get the better of him, already foresaw the time when there would no longer be any airplanes, ships, trains or cars and, therefore, no longer any roads or railway lines, ports, airports or stations.” (Langelaan, 1957)

On Things, Objects and Networks: This paper explores the disintegration of the ‘thing’ through the use of a set of instruments and processes that dissolve their solidity, permeability and permanence and begin to erode the historic infrastructures that support them. Described as ‘Operating Systems’ they highlight the fact that the ‘thing’ can no longer be understood as a thing, but as a collection of agile sub things within the context of a larger volatile meta thing. Not being particularly well tuned to these fragments and clusters our minds, communities and institutions struggle to categorise, articulate and even recognise their significance. Consequently we need to shed the traditional technologies that see ‘things’ and instead come to terms with instruments that recognise traces, collect data and manifest temporal shifts through visualisations and sonifications. However, before dismembering the thing it is worth considering why the thing is significant.

After the establishment a networked global culture at the end of the last Century, it is somewhat ironic that, at the start of the new Century, an emphasis on the ‘thing’ should emerge. After aeons of human fascination with the thing, its commodification, manufacture, distribution and reproduction, the network offered an opportunity to rethink our relationship with matter and the physical world. The anticipation was that in living as networked creatures we might achieve a reconstituted, connected consciousness and a rediscovered post-industrial spirituality. Of course the agenda for the Internet of Things is that these things should be networked, but in focusing on the ‘smarter’ ‘thing’ there is a natural preoccupation, formed

through a behavioural familiarity of our species comfort zone, with the identification of the thing within the network rather on the connective tissue of the network itself.

The IoT emerged through an awareness of an increased significance of smart objects within our culture. Sterling's *Shaping Things* (2005) describes the transcendence of inanimate objects when enhanced through the addition of QR/Barcodes. The 'spime' is no longer physical objects but an instantiation of an immaterial system. Bleeker's *Manifesto for Networked Objects* (Bleeker, 2006) explores how, from a design perspective, objects are facing a mutation in anticipation of a significant change in the material world around us. Turkle's collection of edited texts in *Evocative Objects, Things We Think With* (Turkle, 2007) aspires to echo the insights of Vannevar Bush's *As We May Think* (Bush, 1945) in terms of an awareness of a new human connectivity, an extra cranium networked connectivity rather than an internal organisational connectivity.

These texts describe the evolution of HCI and Interaction Design, dating back to the mid 1990's, away from the screen through an engagement with pervasive and ubiquitous technologies that embrace a broader engagement with human behaviour and social interaction. The influence of Vygotsky's 'Activity Theory' and latter Hutchins 'Distributed Cognition' become more significance with this shift from the screen to physical objects. Both explore the human interaction with symbolic and physical artefacts within a broader social sphere, 'human mind emerges and exists as a special component of human interaction with the environment'. (Kaptelinin, 1996). This is most memorably played out in Kubricks 2001: A Space Odyssey (1968) during the early pre-human savannah scenes. The bone of the slaughtered bovine becomes a transformative object, not only shaping the physical environment and becoming a social tool of power, but also triggering a transformation in the consciousness primate that ultimately leads, through a punctuated equilibrium to the evolution of Homo sapiens. It is not however just the ape that is transformed, the object itself undergoes a change, it transforms from a bone to a weapon. 'Objects can be transformed in the course of an activity; they are not immutable structures' (Nardi, 1996).

The Name of the Thing

This trajectory of object transformation eventually became framed as 'The Internet of Things' or more palatably 'IoT'. From its origins in the academic network of the AUTO-ID labs (REF) at the MIT in the late 1990's it emerged as a policy report from the International Telecommunication Union (ITU) in 2005. The term has now become a blanket term for smart objects, big data and networked communications devices in a pervasive and ubiquitous framework with a strong currency in industry, institutions and universities. IoT refers to the technical and cultural shift that is anticipated as society moves to a ubiquitous form of computing in which every device is 'on', and every device is connected in some way to the Internet. The IoT has the potential to transform how we treat objects, care about their origin and termination and the connections between them – and us.

At this point it is worth considering the differences between 'Things' and 'Objects'. Ontologically things and objects are not the same. Richard Coyne articulates a difference as: "You can treat things as "mere objects," but things can't be "mere things." Thing already carries connotations of significance, history, meaning, memory." (Coyne, 2011) Although framed as a subcategory of objects, Coyne highlights that a thing is not a "mere thing" an abstract entity but it is a specific time and space. A thing is part of a real flow of life with significance, history, meaning and memory. The thing is at the fulcrum of a specific network: "Whatever things are, they are individual, situated, contextual, and born of unresolved contest. No thing is quite as it seems, or perhaps more as it seems than we think." (Coyne, 2011). Prior to the debate around things and objects museology has struggled with similar concerns following the liberation of museum artefacts from the tyranny of colonialist

interpretation panels. "... artefacts do not exist in a space of their own, transmitting meaning to the spectator, but, on the contrary, are susceptible to a multiform construction of meaning which is dependent on the design, the context of other objects, the visual and historical representation, the whole environment;..." (Saumarez Smith, 1989).

And here in lies the problem. In identifying an object as a thing we instantly release it from the stasis field of a designed 'form and function'. It enters into an environment where meaning leaks through cultural-osmotic pressures to and from all the other things that surround it. We struggle to categorise and define the edges of things in order to retain their value and form whilst simultaneously deploying them within a series of cultural exchanges that contaminate them with a patina of encrusted associations and memories. Things exist within a tensegrity of meaning and context, and around these meanings and contexts we form disciplines and hierarchies that enforce artificial distinctions. If we look at the nature of our academic institutions the hierarchy formed around the categorisation of things is so culturally embedded that it is rarely questioned. Multiple layers of concentric knowledge circles form the architecture of Universities; Education departments layered on Psychology, layered on Biology, layered on Chemistry, Layered on Physics. This onion of knowledge is frighteningly impermeable, for whilst the things that each discipline scrutinises are slippy with meaning, the disciplines themselves establish membranes that actively resist leaks from one discipline to another. All these blind disciplines feeling the same elephant.

The name of the thing and the understanding of thingness is critical if these membranes are to be made more permeable. In removing the name we suddenly see not a city but a collection of buildings and connecting roads, not a building but a collection of rooms and corridors, not a body but a collection of organs and limbs. By dismembering the thing into collections of things it might be possible to reconsider the established frameworks that govern them. These might be social, political and economic but ultimately there is an increasing cultural imperative for shedding the name of things.

"it is nor hand, nor foot,
Nor arm, nor face, nor any other part
Belonging to a man."
(Shakespeare, 1564–1616)

Fly Thru...

Within certain disciplines there are already signs of fractures within the dominant model. The focus in microbiology for instance has been on an understanding of the single bacterium, the structure and processes that constitute the thing. Within the domain there is a slow but steady shift of focus from the bacterium to bacteria, not the single thing but the communities of things. There is a new understanding of the role of Quorum Sensing and impact of changes in physical and genetic structure that result from the single thing acting as a meta-thing. Within the gestalt this may have influenced the rise of interest in domestic fermentation within western cultures, a rediscovery of processes that were smothered by industrial food processes. The domestic Scoby (Symbiotic Colony Of Bacteria and Yeast) (figure 1) does not just provide an interesting Kombucha tea, but through the process of self-duplication the single bacterium becomes the colony becomes the duplicated colony that can be circulated within a human community - a thing of things.



Figure 1 . Scoby (Symbiotic Colony Of Bacteria and Yeast).

And another thing of things: at a larger scale, to students of Entomology a fly is no longer recognised as a ‘body’ but through an analysis of its DNA. Its genetic code signifies the creature, its past and future manifestation. The thing itself only important as a transitional and modifiable code, some thing that can be tweaked, reconstituted and recombined, something that is one but not the same.

Sample from the Drosophila FlyBase compiled sequence for FBtp0000204
(http://flybase.org/cgi-bin/get_construct_seq.cgi?id=FBtp0000204)

```
1801 gtggtggatg aagccaatat taaaacccac ggcattgtc caatgaatcg tctgaccgt
1861 gatccgegtt ggttaccggc gatgagcggaa cggtaacgc gaatgggtca gccgcgttgt
1921 aatcacccga gtgtgatcat ctggtcgtg ggaaatgaat caggccacgg cgtaatac
1981 gacgcgtgt atcgctggat caaatctgtc gatccttccc gccccgtca gtatgaaggc
2041 ggccggagccg acaccacggc caccgatatt atttgcggta tgtacgcggc cggtggatgaa
2101 gaccagccct tcccggtctgt gccggaaatgg tccatcaaaa aatggctttc gctaccctgga
2161 gagacggegcc cgctgtatct ttgcaatac gcccacgcga tggtaaacag tcttggcggt
2221 ttgcataat actggcagggc gtttgcgtatc tacaggccgg cttcgcttgg
2281 gactgggtgg atcgtcgat gattaaatat gatggaaatcg gcaacccgtg gtcggcttac
2341 ggcggtgatt ttggcgatac gccgaacgtt cgccagttt gtatgaacgg tctggcttt
2401 gccgaccgca cggccatcc agcgctgacg gaagcaaaac accagcagca gttttccag
2461 ttccgttat ccgggcaaac catcgaaatcg accagcgaat acctgttccg tcatagegt
2521 aacgagctcc tgactgtt ggtggcgctg gatggtaacgc cgctggcaag cggtgaagt
2581 cctctggatg tcgtccaca aggtaaacag ttgattgaac tgcctgaact accgcagccg
2641 gagacggeccg ggcaactctg gtcacatgtc cgcgtatgtc aaccgaacgc gaccgcatgg
2701 tcagaagccg ggcacatcg cgcctggcag cagtggcgatc tggccggaaaa cctcagtgt
2761 acgtcccccg ccggtccca cgcacatcccg catctgacca ccagcggaaat ggattttgc
2821 atcgagctgg gtaataagcg ttggcaattt aaccggccagt caggctttt ttcacagatg
```

A Fly; a thing that can be merged and re-engineered, a thing in transition that is nor hand, nor foot, nor arm, nor face, nor any other part. A thing that has become a script that can be rewritten and retold, and like Andre Delambre the near future is a place without things like airplanes, ships, trains, cars, roads, railway lines, ports, airports, stations – and flies.



Figure 2. One but not the same. The Fly, 1958.

'Fly Thru' is a reconstruction of a thing (fly) from many things (parts of a fly). The Drosophila was encased in a block of resin at Dept. of Theoretical Biology, University of Vienna by Dr. Brian Metscher. It was then sliced into over 5000 slices from end to end; each sliced photographed using a microscope, and then reassembled at i-DAT by Musaab Garghouti and Pate Carss, in collaboration with Peter Smithers from the School of Biomedical and Biological Sciences at Plymouth University. The head itself consists of 1600 slices and the larger body of 4000 slices. The Fly was then reconstructed as a volumetric rendering (figure 3) composed of 600 slices at 6 µm using DICOM data to OSG, Drishti and 3d Studio Max. The reconstituted fly can then be navigated and 2k resolution within the 9m FullDome environment of the Immersive Vision Theatre. The subsequent 3D animation of the volumetric model revealed an extraordinary symbiotic relationship. The twisted tube structure in its abdomen is not its intestines, but instead a parasitic worm waiting to emerge, when ripe, to devour the Fruit Fly from the inside. It transpires that this thing of many things was in fact a composite thing – half fly, half parasite, neither one thing nor the other.



Figure 3. Fly Thru, *Drosophila*.

Operating Systems for Things (Buildings and Bodies)

Within this transcalar context i-DAT is developing a range of ‘Operating Systems’ (<http://www.op-sy.com/>) to dynamically manifest ‘data’ as experience in order to enhance perspectives on a complex world. The Operating Systems project explores data as an abstract and invisible material that generates a dynamic mirror image of our biological, ecological and social activities. The focus here is on these Operating Systems ability to reduce a building, body and environment to a series of data streams and the ability of the Dome-OS to reconstruct these as immersive visualisations and sonifications.

i-DAT’s Immersive Vision Theatre, described above, is a polysensory bubble in time and space, an omni-focal oculus looking into the near future and distant past. As a truncated 9 meter, single projector FullDome, with 25 degree tilt, accommodating 40 seats, the IVT is a transdisciplinary instrument for the manifestation of material, immaterial and imaginary worlds. As such it acts as a unique tool for examining things, both simple and complex. In the context of the Operating Systems Dome-OS can be used to visualise and sonify complex data sets extracted from a variety of sources. As a digital imaging technology it offers a permeable platform for data sourced from other imaging technologies. It has been used to visualise Atomic Force Microscope (AFM) data, to construct an immersive nano-scape which immerses the viewer in an interactive molecular landscape, or to visualise the dynamic data sets generated by the Arch-OS system or those data sets generated by Bio-OS and Eco-OS.

Dome-OS’s has played a role in dismembering the things we know as bodies and buildings. The ‘Human Geography’ project (figure 4), which formed the basis of the Bio-OS system (<http://www.bio-os.org/projects/>) was launched in i-DAT’s Immersive Vision Theatre and displayed the real time bio data fields from the Bio-OS wearable equipment. Bio-OS places the data generated by the individual human body at the centre of a complex network of interactions. It considers the body as the foci rather than the institutions society builds around it. Bio-OS attempts to define a collaborative body that is neither ill nor super fit, but an aggregation. The bodies temporality and not spatiality was the focus of attention, its transitions as a flow through time, a trace to be captured and communicated, became the important ingredient in understanding the dynamics, mechanics and physics of the physical body.

Bio-OS consists of a range of biosensors connected to a mobile phone which streams sensed bio data to the Op-Sy.com server. Consequently Bio-OS generates a rich mix of quantitative and qualitative data that can be seen as a ‘techno-ethnography’. The body operates as conduits for exchange for ideas, knowledge and the passing of physical objects. The body is also a node on more problematic network, such as supply chains for food, traffic and amenities. Bio-OS explores the temporality of the body and the latency of the network of bodies and the impact on the environment. Bio-OS engages with the body and the ‘things’ that cluster around it through a process of participatory design of ‘provocative prototypes’ that will elicit real time data. The contemporary body freely melts into the technology that surrounds it as distinctions between body and instrument dissolve. Its physicality is broken down to data feeds, locations and behaviours. The body is no longer a thing but a series of interactions that define it.

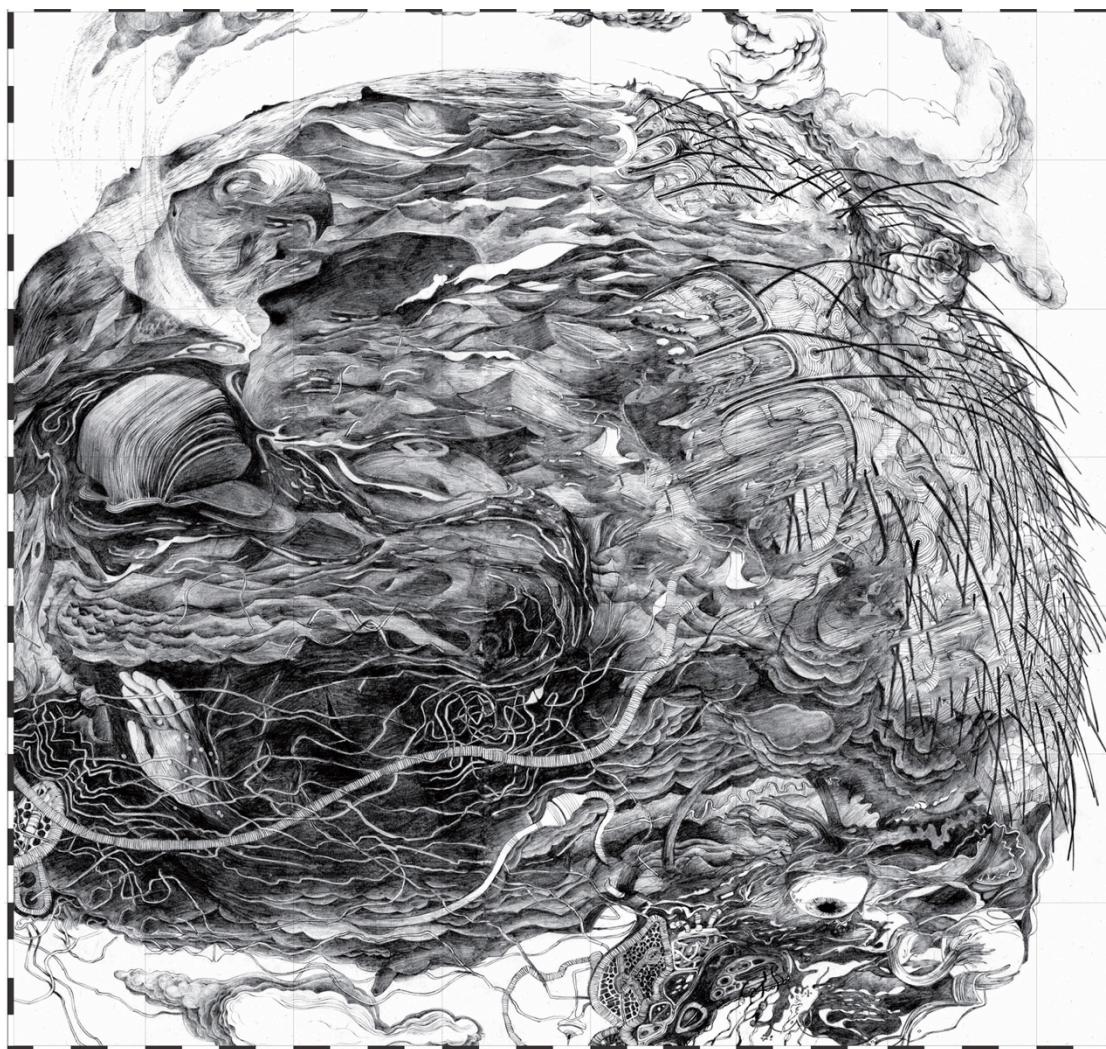


Figure 4. Human Geography.

Dome-OS also deconstructed a 5 storey building into a real time model of environmental data. Data captured through Arch-OS was made manifest through the fish eye environment. An example would be the collaborative workshop (<http://www.i-dat.org/ahobartletti-dat/>) with i-DAT, the Advanced Architectural Design, AHO Oslo School of Architecture and Design, Norway, and A.V.A.T.A.R, Bartlett School of Architecture, University College London. Here, designers, architects and coders processed the real-time data from a building into dynamic visualisations within i-DAT's 9m FullDome (<http://www.i-dat.org/toolbox/>). The deconstruction of the building explored new methodologies for designs for structures based on the modelling of behaviour, data and inhabitants interactions. The success of the workshop was clearly manifest through a transformation in the participant's appreciation of the building as a temporal system, and not a physical mass of glass and steel.

Fly's Eye View

"Not quite sure of her direction Tess stood still upon the hemmed expanse of verdant flatness, like a fly on a billiard-table of indefinite length, and of no more consequence to the surroundings than that fly." (Hardy, 2008, p. 125).

Finally, an example of a blogject that is also a component of something more complex than a collection of things. Eco-OS collects data from an environment through the network of ecoids and provides the public, artists, engineers and scientists with a real time model of the environment. Eco-OS provides a range of networked environmental sensors (ecoids) for rural, urban, work and domestic environments. They extend the concept developed through the Arch-OS and Bio-OS projects by implementing specific sensors that transmit data to the Operating Systems Core Database. The Eco-OS project explores the manifestation of real time environmental data harvested, aggregated to reveal active comparisons through remote sensor networks of ‘ecoids’. The dynamic display of data is facilitated through a FullDome corrected game engine. Eco-OS has been used to deliver the Confluence in the North Devon Biosphere from 10/11-07/12 (<http://confluence-project.org/>).

Ecoid's (figure 5) are sensor devices (small pods) that can be distributed through an environment. The sensors allow environmental data to be collected from the immediate vicinity of each ecoid, displaying heat, light, humidity, movement, wind speed, water flow and turbidity. Each ecoid blogs its data, however the ecoid's thingness dissolves as they work together forming a mesh or star network to cover large distances of territory. The sensors are connected together through the formation of Wireless Sensor Networks (WNS) that enable the coverage of an extensive territory (several kilometres). Data is broadcast through the mesh or star network to a base station for transmission to the Eco-OS server and from there as xml/RSS feeds to a variety of readers.



Figure 5. An Ecoid in a bush is worth....

The landscape, which is unreachable and always over there, is transformed into a thing we can access through our mobile phone or something we can immerse ourselves in within a FullDome environment. The fly on the billiard-table is suddenly not a fly, but a swarm of flies and the territory dissolved into a stream of data, far away, so close.

As God is my Witness I saw the Thing!

“Inspector, it wasn’t wrong to destroy the ‘Thing’?
The fly headed human? No.
It wasn’t Andre, I couldn’t have hurt Andre, but I am glad, I am glad the ‘Things’
dead.”
(The Fly, 1958)

The authors, the practical artists/designers who never allowed theories or daydreams to get the better of us, already foresee a time when there will no longer be things, and with the absence of things the structure of knowledge will be forced to reform itself around transdisciplinary negotiations, ttggcgatac gccgaacgat cgccagttct gatgaacgg tctggcttt etc.

References

- 2001: A Space Odyssey, 1968. Film. Directed by Stanley KUBRICK. USA: MGM.
- Bleeker, J. (2006) A Manifesto for Networked Objects — Cohabiting with Pigeons, Arphids and Aibos in the Internet of Things. Retrieved October, 07, 2012, from:
<http://nearfuturelaboratory.com/2006/02/26/a-manifesto-for-networked-objects/>
- Bush, V. (1945). As We May Think. Retrieved October, 01, 2012, from:
<http://www.theatlantic.com/magazine/archive/1945/07/as-we-may-think/303881/>
- Coyne, R. (2011) Reflections on Digital Media & Culture. Retrieved October, 07, 2012, from:
<http://richardcoyne.com/2011/04/23/nothing-as-it-seems/>
- Hardy, T. (2008). *Tess Tess of the d'Urbervilles*. London: Vintage.
- ITU Internet Reports 2005: The Internet of Things. 2005, 7th edition. Retrieved October, 01, 2012, from: <http://www.itu.int/pub/S-POL-IR.IT-2005>
- Kaptelinin, V. (1996). “Activity Theory: Implications for Human Computer Interaction.” In Nardi, B. (ed) “Context and Consciousness: Activity Theory and Human-Computer Interaction”. MIT Press.
- Langelaan, G. (1957) The Fly. Playboy magazine. June Issue, Vol4 No.8, pp17-18/22/36/38/46/64.
- Nardi, B.A. (1996). “Activity Theory and Human Computer Interaction”. In Nardi, B. (ed) Context and Consciousness: Activity Theory and Human-Computer Interaction. MIT Press.
- Shakespeare, W. Romeo and Juliet, Act II. Scene II. Retrieved October, 07, 2012, from:
<http://www.bartleby.com/70/3822.html>
- Sterling, B. (2005). Shaping Things. Cambridge: MIT Press.
- Saumarez Smith, C. (1989) Museums, Artefacts, and Meanings. The New Museology. Vergo, P, ed. pp19. Reaktion Books Ltd, London.
- The Fly, 1958. Film. Directed by Kurt NEUMANN. USA: 20th Century Fox.
- Turkle, S. (2007) *Evocative Objects, Things We Think With*. Cambridge: MIT Press.

Images

Figure 1 . Scoby (Symbiotic Colony Of Bacteria and Yeast), image by Mike Phillips.

Figure 2. One but not the same. Images from The Fly, 1958. Film. Directed by Kurt NEUMANN. USA: 20th Century Fox.

Figure 3. Fly Thru, Drosophila. Volumetric render by i-DAT (Musaab Garghouti, Pate Carss), in collaboration with Peter Smithers, School of Biomedical and Biological Sciences at Plymouth University

Figure 4. Human Geography. Cover image from HUMAN G E O G R A P H Y v1.0, Bio-OS: D.I.Y, www.bio-os.org/human-geography. ISBN 978-1-84102-298-7. 2011. Plymouth: i-DAT. By Tom Barwick.

Figure 5. An Ecoid in a bush is worth.... image by Mike Phillips.

Notes

Operating Systems form the substrate i-DAT's Arts Council England National Portfolio Organisation programme (<http://www.i-dat.org/>).

The Bio-OS collaboration includes: Artshare (<http://www.artshare.com.pt/>); Message – <http://www.message-research.org/>; E-Health and Health Informatics; School of Biomedical and Biological Sciences. The i-DAT production team include: the authors, Tom Barwick, Simon Chmiewliski, Luke Christison, Katy Connor, Kurt Defreitas, Hannah Drayson, Simon Evans, Dr Andrew Evenden, Luis Girao, Simon Johnson, Professor Ray Jones, Rob Jones, Lee Nutbean, Dean Owens, Chris Saunders, David Strang, Hannah Wood, Sarah Youen.

Eco-OS supported the Confluence-Project (<http://confluence-project.org/>), a partnership of i-DAT, The North Devon Biosphere Foundation, Beaford Arts and Appledore Arts. The Confluence Project was a ground breaking cross disciplinary arts, technology and environment project that was delivered by the North Devon Biosphere Foundation, Beaford Arts, Appledore Arts and i-DAT. The project is funded by Arts Council England and Leader 4. Commissioned artists Jon Pigott, Antony Lyons, Simon Ryder and Simon Warner developed new work that responded to the environment of the River Torridge and its communities. Supported by and working with i-DAT, the artists worked with a resource of real-time and recorded data collected through ECOIDS (data capturing devices) to develop their practice and create new work.

Author Notes

i-DAT (<http://www.i-dat.org>) is an Arts Research Organisation that acts as a catalyst for creative innovation across the fields of Art, Science and Technology, facilitating regional, national and international collaborations and cultural projects. i-DAT is developing new ‘tools’ for production, dissemination and participation that challenge traditional models of creation and consumption, and embrace the shifting relationships between audiences and cultural producers. i-DAT’s ‘Operating Systems’ provide a platform for a range of transdisciplinary collaborations. This paper refers to specific collaborations including:

- Eco-OS through the Confluence Project in collaboration with Beaford Arts, the North Devon Biosphere Foundation, Artshare and artists Jon Pigott, Antony Lyons, Simon Ryder and Simon Warner.
- (<http://confluence-project.org/>)
- Arch-OS through collaborations with the Bartlett School of Architecture and AHO in Oslo and the eViz EPSRC funded research collaboration (<http://www.eviz.org.uk/>)
- Dome-OS through collaborations with Biomedical and Biological Sciences and <http://www.fulldome.org.uk/>
- Bio-OS through collaborations with the Arts Council England, Slingshot (<http://slingshoteffect.co.uk/>) and artists Hannah Wood (<http://www.hannah-wood.com/>) and Katy Connor (<http://www.katyconnor.com/>)

Mike Phillips is Professor of Interdisciplinary Arts, Plymouth University, School of Arts & Media, Faculty of Arts. He is the Director of Research at i-DAT, an Arts Council England National Portfolio Organisation, and a Principal Supervisor for the Planetary Collegium. His

R&D orbits digital architectures and transmedia publishing, and is manifest in a series of ‘Operating Systems’ that dynamically manifest ‘data’ as experience to enhance perspectives on a complex world. He manages the FulDome Immersive Vision Theatre (IVT), a transdisciplinary instrument for the manifestation of material, immaterial and imaginary worlds and is co-editor of *Ubiquity, The Journal of Pervasive Media*: <http://www.ubiquityjournal.net/>

E-mail: mike.phillips@plymouth.ac.uk

Gianni Corino is Associate Professor in Interactive Media, i-DAT’s Creative Producer and Programme Leader for BA/BSc Digital Art and Technology courses at Plymouth University, School of Arts & Media, Faculty of Arts. His PhD research consolidates many years of interdisciplinary practice around the idea of Embodied networks. The thesis investigates the relevance of the ‘thing’ and the ‘object’ in the Internet of Things and proposes an alternative design approach to the field. He established the “Smarter Planet Lab” as an interdisciplinary facility in partnership with IBM – Hursley Innovation Centre. Previous projects in the area of IoT include Remote Risonanaze, Quixote or Dn[t]cube.

E-mail: gianni.corino@plymouth.ac.uk