**Human Geography.**

**Mike Phillips**
i-DAT, University of Plymouth
mike.phillips@plymouth.ac.uk

**Abstract:**

Human Geography explores a new pornography of the body. The exposure of the human body to the crowd through imaging technologies that penetrate beyond the skin to the molecules within. The paper describes the background to the emergence of Bio-OS (http://www.bio-os.org/) and the development of the Bio-OS tools through several artists commissions and a series of 'Data Labs'. As a biological instrument Bio-OS builds on the i-DAT's 'Operating Systems' (www.op-sy.com) (figure 1) initiative (Arch-OS, CO-OS and Eco-OS). These open tools for gathering data from environments (buildings and landscapes) and organisms (crowds and bodies) will be focused on delivering dynamic and interactive outputs through a range of technologies (such as social networks, streaming media, mobile phone Apps, Full Dome environments, etc). These 'Operating Systems' dynamically manifest 'data' as experience in order to enhance perspectives on a complex world.

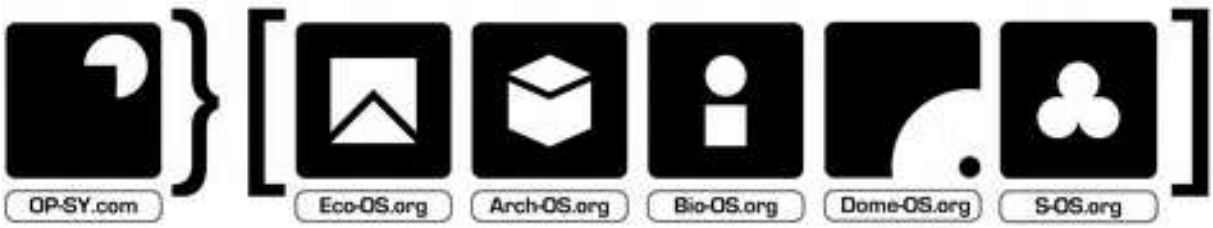


Figure 1: Operating Systems

**Skin Flick:**

"Science is the ultimate pornography, analytic activity whose main aim is to isolate objects or events from their contexts in time and space. This obsession with the specific activity of quantified functions is what science shares with pornography."(JG Ballard, 1969)

The intention of Bio-OS is to make the data generated by human biology tangible and readily available to the public, artists, engineers and scientists. 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 Operating Systems project proposes a range of tools and initiatives that have the potential to enhance our ability to perceive and orchestrate this mirror world.

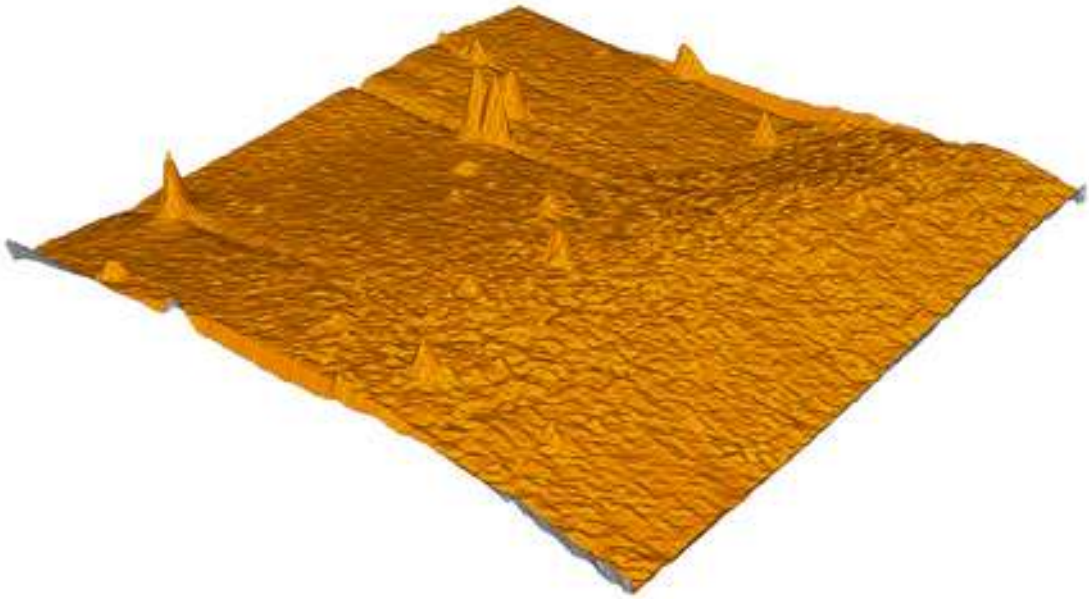

Figure 2: AFM Landscape

It is a temporal fragmented body that Bio-OS engages with. It attempts to define a collaborative body that is neither ill nor super fit, but an aggregation. A body in motion that is shared and simultaneously an individual and a crowd.

The Operating System Project is preoccupied on collecting data and publishing it within an open framework. In the process it is necessary to build instruments that gather and generation data, from bodies, crowds, buildings, environments what ever can be measured, both tangible and intangible. Bio-OS sees the body as a landscape and as an actor in a connected landscape. Bodies in Environments / Bodies as Environments. Within and through these internal and external landscapes the instruments developed for the Bio-OS create a space for a dialogue between the internal autonomous processes and the actions they perform within the world. The insides are manifest externally and Stelarc's ‘metaphysical fog’ clears momentarily.

“We mostly operate as absent bodies. That’s because A BODY IS DESIGNED TO INTERFACE WITH ITS ENVIRONMENT – its sensors are open to the world (compared to its inadequate internal surveillance system). The body’s mobility and navigation in the world require this outward orientation. Its absence is augmented by the fact that the body functions *habitually* and *automatically*. AWARENESS IS OFTEN THAT WHICH OCCURS WHEN THE BODY MALFUNCTIONS. Reinforced by Cartesian convention, personal convenience and neuro-physiological design, people operate merely as minds, immersed in metaphysical fog.” (Stelarc, 1995)

As our instruments evolve from an isolated artefact, through physical and social networks into an all-pervading system or process, the nature of our relationship with them will inevitably change. There is now a sophisticated symbiosis between our instruments, and us, what happens to that relationship when the instruments we manufacture become ubiquitous and decentralised from hospitals and medical institutions. Imaging systems and digital instruments have revolutionised our relationship with the inside of our bodies creating a new pornography.

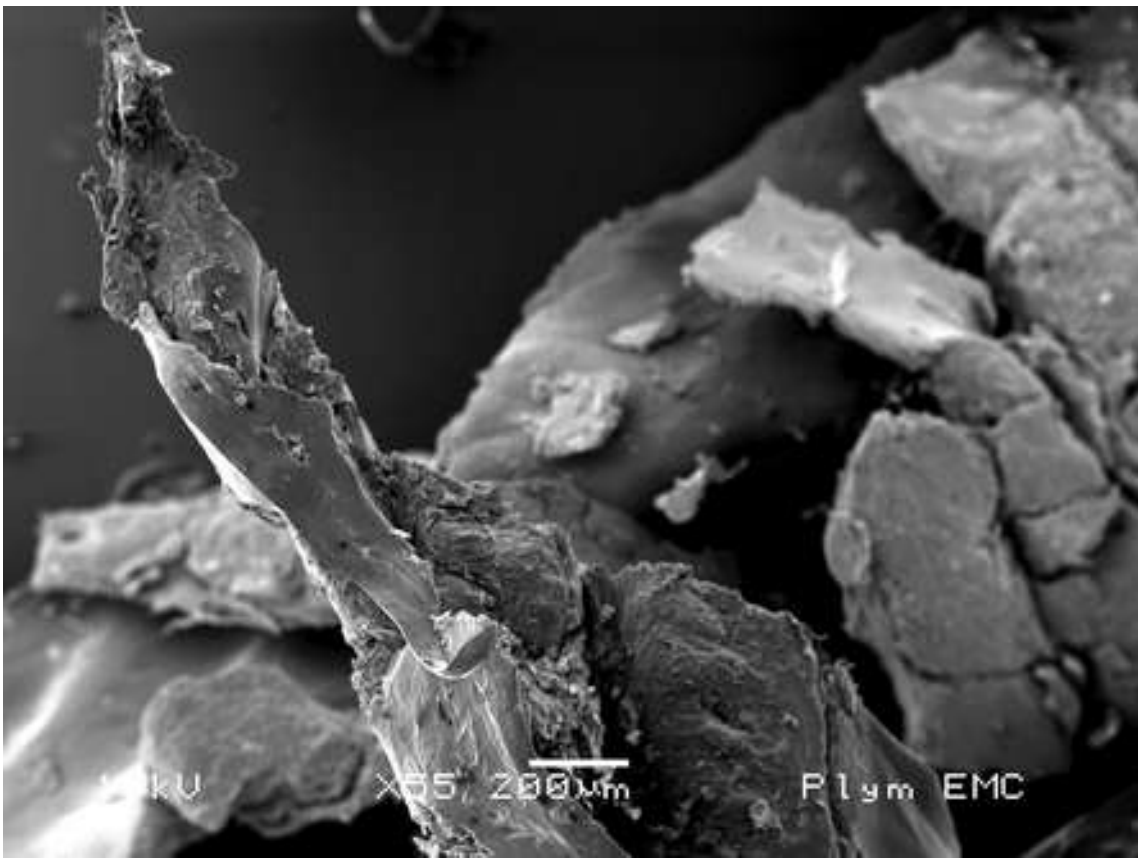


Figure 3: The Artists Flesh

Image Science expands the vocabulary of the photograph or film to embrace imaging and visualisation technologies that penetrate beneath the surface and at resolutions beyond the limits of the human eye. Scientific and artistic endeavour for truth and knowledge has long been dominated by a methodology that is primarily reliant on 'vision'. These resolutions penetrate our private worlds exposing us to scrutiny beyond any philosophy of aesthetics. The ultrasound devices that invade our solitude in the womb, the spluttered frozen golden moments Scanning Electron Microscope or the touch of the Atomic Force Microscope's stylus caressing the forces that holds our molecules together.

**Peep Show:**

Figure 4: 'A Mote it is…'

The ‘A Mote it is…’ project was developed by the author to explore the limits of the human gaze and the trauma of seeing things that are beyond the limits of sight. ‘A Mote it is…’ was developed for the Art in the Age of Nano Technology at John Curtin Gallery, 2010. “A mote it is to trouble the mind's eye.” (Shakespeare) words spoken by Horartio to describe Hamlet’s father’s ghost, an entity seen but not believed and one is left to wonder if it is just the seeing of it that makes it real - its existence totally dependent on the desire of the viewer to see it.  The ‘mote’ or speck of dust in the eye of the mind of the beholder both creates the illusion and convinces us that what we see is real. Something just out of the corner of our minds eye, those little flecks magnified by our desire to see more clearly. Yet the harder we look the more blurred our vision becomes.

A Mote it is... is constructed from data captured by an AFM (Atomic Force Microscope) from a ‘mote’ or piece of dust extracted from the artist’s eye. The whirlwind of data projected within the gallery is rendered invisible by the gaze of the viewer. The more we look the more invisible it becomes - look away and it re-emerges from the maelstrom of data. A ghost of the mote can be seen in the viewer’s peripheral vision but never head on.

Our Twenty First Century magic instruments mark a dramatic shift from the hegemony of the eye to a reliance on technologies that do our seeing for us - things so big, small or invisible that it takes a leap of faith to believe they are really there. Our view of the ‘real world’ is increasingly understood through images made of data, things that are measured and felt rather than seen. What we know and what we see is not the same thing.

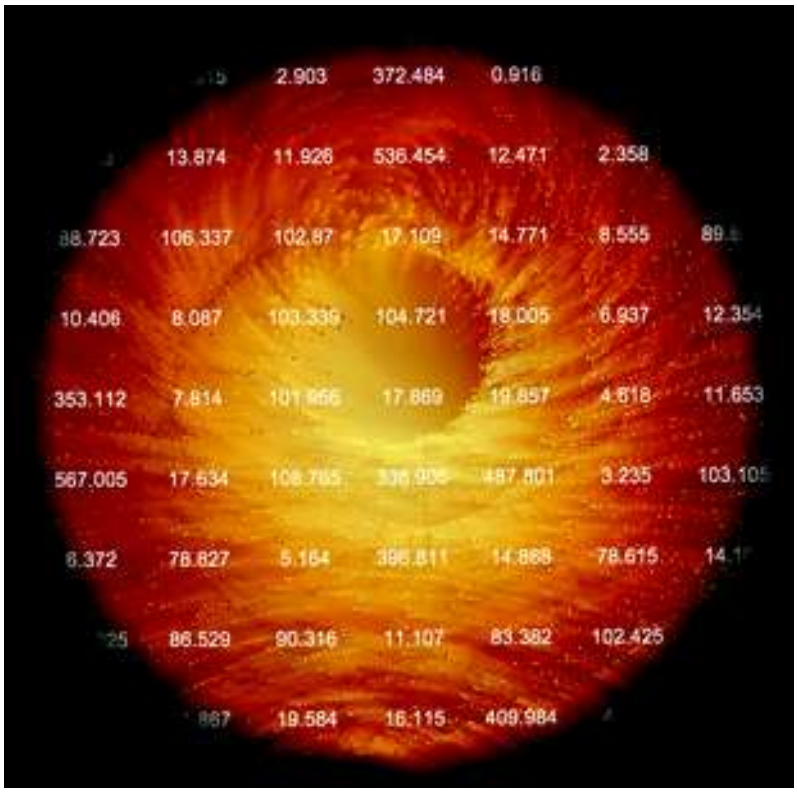


Figure 5: A Mote it is... Data

## <body text="moist">

Bio-OS builds on this open technical framework to offer the opportunity to collect and manifest biological data. Dynamic visual and sonic experiences derived from human movement are being tailored to enhance public understanding of the collective, mass biology. In this context Bio-OS and its distribution and engagement mechanisms provide an open tool for public engagement with a domain that is primarily owned by medical, scientific fields.

Bio-OS provides accessible tools (through ‘hacks’, wearable devices, phone Apps and domestic and public health technologies and social media tools) that are being deployed in daily life for monitoring health and activity. Data collected from these tools feed dynamic databases that facilitate a shared understanding of the mass body index through visualisations and sonifications – a data body culture of health.

Bio-OS generates a rich mix of quantitative and qualitative data. Collectively these processes establish an open participatory ‘techno-ethnography’ - mechanisms for evaluating engagement and participation. It is the body as a temporal event and the trigger for a whole series of interactions that underpins Bio-OS as a platform. Here the body is seen within the context of numerous external frameworks and social cultural and economic systems. For instance, embracing the preoccupation of the Banking system where processes are based around key stages in the life of a body, birth, marriage, divorce and death (not necessarily in that order). Or the body on a more short-term basis, as the source of sewerage or food consumption around which provoke massive engineering, financial and ecological problems. As such, the body acts as an active node in a dynamic network, linking resources, technologies and social processes.

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 idea of the a corporeal archive emerged as a real time archival process that attempted to capture, articulate and disseminate 'unstable' 'difficult' or 'live' body-based media (particularly forms of dance, theatre, and performance art) through software and conceptual tools. The prototype ‘Liquid Reader’ (Liquid Reader™ v1.1) was a ‘Performance Research e-Publications/ Liquid Press’ partnership, an ongoing collaborative project between Ric Allsopp (Performance Research) and Scott deLahunta (Writing Research Associates) and the author. These prototypes explored the reciprocal relationship between 'live' performance and its dissemination through other media, how ephemeral, body-based practices can be captured, analysed, shared and communicated.

A particular example of this collaboration is ‘read/write/fold Architecture’ (Phillips, Speed, etal 2004). ‘read/write/fold Architecture’ is a multidimensional manufacturing and distribution system for generative architecture. ‘read/write/fold Architecture’ allows the user to write - read - modify - print and assemble scale models of generative architectural forms and spaces. Generated in collaboration with the performer Eve Dent, the software is a digital reader that incorporates code captured from a building. The code is generated through a vision system that captures the movement of the performer as she interacts with the architectural space. The traces generated by the code define a new temporal architecture that is represent within the software as dynamic 3D forms. These new forms can be viewed as virtual 3d models, before being printed and folded to construct ‘real’ 3d models.

**Bodies in Motion**

Figure 6: Data Lab

The Bio-OS project is supported by the Arts Council England and was delivered through a series of ‘Collaborative Data Lab’s’, in order to design and share ‘instruments’ or ‘provocative prototypes’ topically described as the ‘Internet of Things’, in this case the human body becomes a networked and shared ‘thing’. The co-development of a series of tools through the commission of several artists has enabled the Bio-OS project to engage with transmedia narratives, data visualisation and social gaming. As well as defining scenarios for particular processed based applications.

i-DAT’s Collaborative Data Lab is an initiative which aims to foster an open and collaborative environment which brings together artists, researchers and scientists to develop ‘provocative prototypes’ that lead to new practice, knowledge and resources for the arts and society as a whole. This initiative will enable artists to engage with these new digital opportunities and processes, to foster the creation of new work and to enable audiences to engage with this work. These activities make direct links between academic research, artistic practise and environmental and societal challenges.

The nature of the prototypes created from the Collaborative Data Labs, the links between them and the technologies that drive them are focused around the concept of ‘data’ as experience through creative productions to better understand the world and our impact on it. The intention is to make the data generated by human, ecological, economic and societal activity tangible and readily available to the public, artists, engineers and scientists for potential social, economic and cultural benefit. The Data Labs pragmatically explored pertinent issues, such as: potential technologies and sensors for data harvesting; data visualisation technologies; the ethics of harvesting data from bodies and environments.

The commissioned artists tasked with engaging in the Bio-OS project to co-design the Bio-OS instruments were: Katy Connor, Hannah Wood and Slingshot. Collectively they embraced practices such as installation work, ubiquitous technologies, data visualisation, multimedia writing and story telling, journalism, creative writing, digital-born crime fiction, social gaming, interaction design and game design.

The provocative prototypes generated from this process include were primarily based around mobile phone technologies (Android, ioio boards, arduino, etc) to capture and

broadcast data from sensors attached to the body. The model developed by the Archo-OS system is incorporated into the body augmentation - data is streamed via 3G to the server where it can be published through SMS, blogs and other social networking API's. In addition GPS identifies the location of the body in space and enables complex interactions with the wearer and the environment they are in. For instance the ability for interactions between heart rate breathing rate to control the opening of doors during social game play. The prototypes them selves can be seen published on Bio-OS site.

**Eulogy:**

Whilst Bio-OS may be seen to transgress the norms of privacy and genteel modesty, its ambitions ability to expose our inner workings and share them with the world goes beyond aesthetics of the classic nude and the pin up. The real time dissemination of biological data enables a larger body to be considered, all of us, together, now, at the same time, in real time. A dynamic data body that embraces the trauma of the birthing pool, the embracement of puberty, the intimacy of the bedroom, the confidentiality of the doctors surgery and the mass body servicing of the hospital and the quiet of the morgue.

References

J G Ballard. The Atrocity Exhibition. Panther Books. 1969, pp 20.

Stelarc. *'Towards the Post-Human'*, Architects in Cyberspace, ed Toy, M. Architectural Design, Profile No 118, Academy Group Ltd, 1995, pp90-99.

Shakespeare, W. Hamlet. Act 1, Scene 1, Line 129.

Phillips, M. 'A Mote it is…' Art in the Age of Nano Technology, John Curtin Gallery, Curtin University of Technology, Perth, WA. For exhibition in 02/2010

Liquid Reader™ v1.1. DVD Supplement. Jointly developed by i-DAT/ Liquid Press, Performance Research e-Publications and DeMo. Liquid Reader™ v1.1 produced by the Liquid Press, an i-DAT (Institute of Digital Art & Technology) research project. 'On the Page' DVD supplements Performance Research Vol.9, No.2 'On the Page' (2004) issn 1352-8165.

Phillips, M, Speed, C, et al. (2004). 'read/write/fold', Performance Research Journal, 'On the Page', Vol.9, No.2, June, p.38-43, Routledge, Taylor & Francis, issn 1352-8165 isbn 0-415-34737-6.

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.

**Bio:**

Mike Phillips, Professor of Interdisciplinary Arts, University of Plymouth, School of Arts & Media, Faculty of Arts. mike.phillips@plymouth.ac.uk.

Mike Phillips is director of i-DAT, a Principal Supervisor for the Planetary Collegium and a supervisor of the Transtechnology Research Groups. His R&D orbits digital architectures and transmedia publishing, and is manifest in a series of ‘Operating Systems’ 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.

These projects and other work can be found on the i-DAT web site at: www.i-dat.org. i-DAT is a Research Group 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. As a networked organisation and ‘cultural broker’ i-DAT’s transdisciplinary agenda fosters ‘open innovation’ and knowledge exchange between companies, institutions, communities and individuals. 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.