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ISEA 2008

INTERNATIONAL SYMPOSIUM ON ELECTRONIC ART 2008 (ISEA 2008)
25 July to 03 August 2008, SINGAPORE
http://www.isea2008singapore.org/

Intelligent Architecture - Complex Environmental Networks

In this panel session the authors explore the potential of 'Intelligent Architecture' as a critical, reflexive and enabling tool to support social interaction, trans-disciplinary research and ecological strategies.

The panel uses the various iterations of the Arch-OS system (http://www.arch-os.com/) as a critical model for the manifestation of dynamic data (social, temporal, ecological and digital/electro/mechanical). The authors critique the role of these technologies and their ability to effectively model, communicate and modify human behaviour. Arch-OS explores the potential generated by the translation of dynamic data from physical and social interactions within a building into volatile and evolving interactive art interventions.

The conceptual underpinning of this panel centres on the affordances offered by dynamic generative data that would otherwise be invisible. With this approach we aim to convey the sense that a more meaningful 'architecture' is physically revealed by peeling back its skin and architectural surfaces and giving the feeling that the occupant is an integral part of the building.

The agenda is to create interventions that perform vital and integral roles in the development of trans-disciplinary research (for example; nanochemistry, applied chemistry, environmental science, biotechnology, and forensic science), ecological monitoring, visualisation and awareness (collaborations with the Centre for Sustainable Futures and the English National Opera) and the development of new architectural strategies. The artworks potential is to represent the visualisation of quantitative scientific research as a qualitative experience within the fabric of the architectural environment. Through large-scale visual projections, 'personal computing', intimate mobile interactions, and the multiple auditory experiences, these systems reveal subtle dialogues between the behaviour of the buildings inhabitants and their environment.

These strategies are demonstrated in two significant applications:

The original Arch-OS installation (http://www.arch-os.com/) in the University of Plymouth and Peninsula Medical School, Plymouth UK

and

the i-500 installation (http://i-500.org/) working with Woods Bagot Architects in Curtin University's new Minerals and Chemistry Research and Education Buildings, Perth Western Australia.

The panelists are:

Shaun Murray work, as published in his book 'Disturbing Territories', is intended to allow the possibility of collaborative practice, and become a digitally networked creative enterprise. The integrity of his projects comes from a distributed network approach whereby the ethics of ecological sustainability needs to be realised. He has exhibited internationally and has developed some major architectural projects through his work with Alsop Architects. He teaches on the Masters programme in the Bartlett School of Architecture.

Mike Phillips is a Reader in Digital Art & Technology, director of i-DAT and heads the Nascent Art & Technology Research Group [www.nascent-research.net]. His trans-disciplinary R&D orbits digital architectures and transmedia publishing, and is manifest in two key research projects: Arch-OS [www.arch-os.com], an 'Operating System' for contemporary architecture ('software for buildings') and the LiquidPress [www.liquidpress.net] which explores the evolution and mutation of publishing and broadcasting technologies. These projects and other work can be found on the i-DAT web site at: www.i-dat.org.

Dr Chris Speed is a Reader in Digital Architecture in the Schools of Architecture and Landscape Architecture at Edinburgh College of Art Speed's research focus is best characterised by his PhD activity which addresses the synthesis and tensions between Social Navigation, Digital Architecture and Human Geography. Operating as a 'maker' he has recently returned from an artists residency programme at Unitec, Auckland, where the work 'Reading Rooms' was developed to visualise how a building might look if its architecture reflected the books that its inhabitants were reading. Operating in real-time the system combined social and architectural data with dynamic 3D computer modelling to generate a 'social' map of a place.

Dr Paul Thomas is currently a Senior Lecturer, Curtin University of Technology, Department of Art, he is coordinator of the Studio Electronic Arts (SEA) at Curtin University of Technology and is the founding Director of the Biennale of Electronic Arts Perth (BEAP). Paul Thomas has been working in the area of electronic arts since 1981 when he co-founded the group Media-Space, which was part of the first global link up with artists connected to ARTEX. His practice lead research is in collaboration with the Nanochemistry Research Institute at Curtin University and the SymbioticA Lab at the University of Western Australia. He is currently collaborating on a public art commission for the Curtin Mineral and Chemistry Research Precinct in collaboration with Woods Bagot Architects. He recently completed his PhD researching the reconfiguration of space. htttp://www.visiblespace.com

Recovering the Reflexive in Architecture

Shaun Murray

Title: Recovering the Reflexive in Architecture

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This paper discusses the relationship between the concept of 'reflexive' within forms of architectural practice. It will explore how aspects of current architectural practice, have used the development of notational systems as a remedy for its own failure to engage with the concept of the reflexive within design.

Notation in architectural drawing

Before the fifteenth century the architectural drawing was thought to be no more than a flat surface and the shapes upon it were but tokens of three-dimensional objects. The Italian Renaissance introduced a fundamental change in perception, establishing the principle that a drawing is a truthful depiction of the three dimensional world, and a window to that world, which places the viewer outside and in command of the view. 'The very word "per-spective" means through seeing', writes Tom Porter. This 'through seeing' seems to suggest a relationship with environment through drawing as embedded and contingent. Robin Evans writes that 'Architectural drawings are projections, which means that organised arrays of imaginary straight lines pass through the drawing to corresponding parts of the thing represented by the drawing.' (Evans, Architectural Projection, p.19)

Whether perspective or production information, the architectural notational systems in current architectural practice refers to something outside itself. Its value as a notation is secondary to its primary purpose, which is to describe a building; therefore, it is usually seen in conjunction with other drawings, whether or not this leads to construction.

Through the relationship between notation in architectural drawings the practice of architecture has rapidly changed. Through new techniques in drawing, communication and language allow even the most normative practice to enjoy complete freedom. This arbitrariness and lack of restraint that characterizes this new era of formal freedom raises questions about other paradigms that seek to rediscover the precisely determined, purposeful, or inevitable attributes of form. A guide would be to not clamber for control over these techniques and technologies but allow the architecture to become apart of larger systems through disturbing territories.

The ecology my practices projects not only specifies its structural changes; it also specifies *which disturbances from the environment trigger them*. According to Maturana and Varela, you can never direct a living system you can only disturb it.

One is the notion of a building existing in the form intended as a result of complex inter-relationship with it, or through it, or on it, where the building itself exists in the relationships between things, not the thing themselves.

The other is the reflexive space of the building itself through cause and action being triggered by the occupant or disturbances in the environment.

Current practice methodologies in contemporary architectural practice have become a series of systems of operations from planning through to building control and schedule of works. In the architectural model the plan has become obsolete as a vehicle to understand the axis of information production towards the construction of a building and the axis of post building systems, which are incorporated after building completion. Through my own experience of working on project in Beijing and shanghai parts of the architects drawings had become redundant in the design of the building due to the speed and economic constraints of construction. This questions not only the relevance of drawing in practice but also the importance of communication in design. If this way of construction becomes a way of practice rather than the exception, we will need to find other means and methods of communicating our architectures.

One way would be to shift this relationship of drawing in practice to a different way of communication through a more complex and integrated notational systems, that would allow us to examine the state of transfer from one medium, as drawing, to another, as environment through 4D holographic projections within the environment itself on a real-time basis.

To have a complex and integrated notational systems that relates directly to an environment would allow a series of palettes of information to be used in the planning stages of the series of systems of operation in architectural practice. If this system related to the planning stage of the process in architectural practice we could have an open sourced and integrated model that would nurture intelligence with the inhabitants.

Buildings have often been studied whole in space, but never before have they been studied whole in time. My interests reside in a synthesis that proposes that buildings adapt best when constantly refined and reshaped by there occupants, and that architects can mature from being artists of space to becoming artists of time.

The word "building" contains the double reality. It means both the "action of the verb BUILD" and "that which is built" – both verb and noun, both the action and the result. Whereas architecture may strive to be permanent, a building is always building and rebuilding. The idea is crystalline, the fact fluid. Could the idea be revised to match the fact?

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Base Data for/to Model Behaviours.

Mike Phillips.

Title: Base Data for/to Model Behaviours.

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This paper discusses the emergence of 'data' as a building material, integral to an architectural manifestation and the detritus of human occupation. Having evolved from a quiescent by-product of CAD systems and galvanised as a substrate of the 90's 'uninhabitables' data are increasingly playing a critical role in our tacit understanding our relationship to each other and our environment, whether local or global, built or 'natural'. As a material the malleability of data makes an ideal canvas for painting future vistas, but equally their flexibility provides the antithesis of the 'Emperors New Clothes', the garments are so frightening everyone pretends they are not there.

This paper focuses on the models provided by Arch-OS (www.arch-os.com) and the i-500 Project (www.i-500.org). The role data plays in these installations is critical to the manifestation of the various technical and creative interventions. Arch-OS, and its implementation as the kernel of the i-500, provides temporal information from interactions within the buildings and in the process of manifesting these behaviors generates complex, dynamic data models. Data generated by the buildings interactions with and the activities of their inhabitants is important, not just because of the generative and dialogical nature of the dynamic, but more significantly because the streams of data generate a temporal genetic architectural grammar. The temporality is significant because it offers real-time responsive modelling possibilities (as harnessed by many of the art works), and the genetic grammar important because it allows specific data sets or objects to be identified, inherited and transmitted. Data models provide not just a mirror to reflect the buildings activities, but a mirror with memory that facilitates comparison between past and current events, enabling simulation and predictive possibilities. To some extent the physical buildings embody the multifarious dynamic tensions described by Kwinter.

"… the consideration of dynamical phenomena or dynamical morphogenesis, toward geometries or patterns that are not static but appear only over time… the study of phenomena no longer in analytic isolation but as embodied within a rich and unstable milieu of multiple communicating forces and influences…"
(Kwinter, S. 2001)

The Arch-OS and i-500 core system can be seen as a dynamic extension of the traditional 'architectural model', but one located in a real-time symbiotic relationship with a building that hosts it. Of particular interest is the intervention Arch-OS can make in these fields where the recursive relationship between the building and its inhabitants plays a critical role in shifting the focus away from easy and dubious assumptions made about the potential of 'intelligence'.

"(…) instead that computation and computer augmented environments are psychosomatic extensions of their user/occupants, and that an ecological model of the user/environment relationship yields fruitful results. Countering the materialist view, this model embraces the cognitive role of the user rather than that of the building, and thereby inverts the priorities set by architectural and industrial discourse on IB (Intelligent Buildings) … The system supporting this environment, Arch-OS, was developed to serve both building systems and – more importantly –expand user awareness of their surroundings."

(Anders, P., Phillips, M. 2004)

These works contribute to a contemporary discourse around information augmentation and ubiquitous computing. The emergence of practices that provide data trails for objects (barcodes, nutritional content, recycling) are commensurate with surveillance and security activities, the tracking and modeling of epidemics through food distribution and travel, and the dissemination of personal and environmental information. Arch-OS and the i-500 contribute to strategies that embrace the notion of 'transformation' and evolution of form, a transmutation from solid to the immaterial, object to process and script to algorithm. These strategies intend to explore the manifestation of individual and social ecologies and aspire to have a direct influence on human behaviour, making a shift from the implied intelligence of a building to the responsible intelligence of its inhabitants.

(…) people operate as a type of distributed intelligence, where much of our intellect behaviour results from the interaction of mental processes and the objects and constraints of the world and where much behaviour takes place through a cooperative process with others.

(Norman. 1993)

Figure 1: GreenScreen, Noogy Installation.

A range of interventions have been made using Arch-OS that attempt to influence behaviour through the manifestation of data and a distillation of objects that engage social and mental processes: slowly moving robotic architectures (Sloth-Bot), performances, installations and projections, culminating in the i-500 Project, a bespoke system for a specified audience, location and research environment. A strong ecological potential has emerged through the manifestation of the data harvested from the BEMS (Building Energy Management System) initiating: collaborations with the Bartlett School of Architecture and the Centre for Sustainable Futures, have constructed dynamic data manifestations using a 10m x 5m LED matrix screen (figure 1); the implementation of mobile tools for the incorporation of individual data (Social Operating System (*www.s-os.org*) and collaborations with the New Economics Foundation (neweconomics.org)); the construction of Arch-OS data feeds for Uniview (www.scalingtheuniverse.com) for inclusion in the global networked dome environments of the Elumenati (www.elumenati.com). These systems transcend physical architecture by activating and embracing social networks, with the potential to generate a revitalized tacit awareness of the world, and show symptoms of a possible slow change of consciousness brought about by a new relationship with data and their ability to provide alternative representations and a subtle experience of the world. The fated Astronauts of the first Apollo Mission were monitored in real time as they were incinerated in their capsule as it sat on the launch pad. The accident report describes how the only information available to the ground crew came through the data collected through bio monitors attached to their suits:

"The biomedical data indicate that just prior to the fire report the Senior Pilot was performing essentially no activity (or was in the baseline "rest" condition) until about 23:30:21 GMT when a slight increase in pulse and respiratory rate was noted. At 23:30:30 GMT the electrocardiogram indicates some muscular activity for several seconds. Similar indications are noted at 23:30:39 GMT. The data show increased activity but are not indicative of an alarm type of response. By 23:30:45 GMT, all of the biomedical parameters had reverted to the baseline "rest" level."
(NASA. 1967)

The bland, mundane horror! Today we face a different kind of incendiary situation; the difference is that, through the plethora of real-time dynamic data, we are privileged to be both inside the capsule and simultaneously monitoring our own data as we burn. A phantasmagorical convergence of simulation and experience.

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Getting over the fence

Chris Speed

Title: Getting over the fence

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This paper examines the relationship between the concept of the 'social' within an aspect of architectural practice. It explores how the detachment of a building site from an urban context through the use of fences and boards inhibits architectures ability to engage with social networks. Using de Certeau and in particular Latour's definition of the social as a critical benchmark, the author identifies the Arch-OS system as having a constructive methodology toward reconciling architectures use of digital systems in order to recover an integrated model of the social.

Architecture has been using computers for many years since IBM's introduction of the first commercial computer aided design (CAD) system for General Motors in 1963. Since then the advent of networked desktop PCs has allowed small businesses and academic centers to use computers to share work around the clock and around the globe, as well as being able to work simultaneously on single CAD documents across a network. In 1990 Mitchell used of the term 'society of design', derived from Marvin Minsky's metaphor 'society of mind' to forecast how complex design problems may be solved through distributed actions (Mitchell et al 1990:489).

Nearly twenty years on, architecture has indeed absorbed technical procedures to improve the communication, management and ultimately profitability of designing and constructing buildings, however any social attributes of networked design remained within the profession and only 'leak out' through public and client consultation. A way of evidencing how architecture appears to mishandle social relations can be found in the contemporary practice of hiding new projects behind high wooden boards that encircle the entire perimeter of building sites. The practice of making new architectural projects invisible from an environmental space so as to allow designer and engineers the opportunity to quarantine a project until it is ready for introduction in to society, is a deeply anti-social practice. This temporal separation from society designed to obfuscate a new building is a conscious act that limits the process of design and construction to take part in any existing or new opportunities for social discourse.
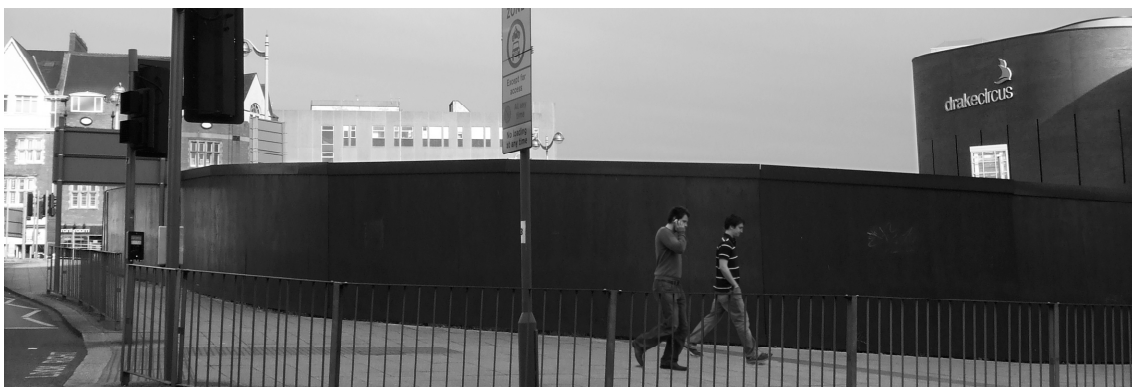
Whilst the practical deportation of a building site has obvious health and safety benefits, its impact on the human geographical fabric of the city is akin to Certeau's critique of a vacation as it prevents the stakeholders in the community taking part in the construction process:

"Everyone goes back to work at the place he has been given, in the office or the workshop. The incarceration-vacation is over. For the beautiful abstraction of the prison are substituted the compromises, opacities and dependencies of a workplace. Hand-to-hand combat begins again with a reality that dislodges the spectator without rails or window-panes. There comes to an end the Robinson Crusoe adventure of the travelling noble soul that could believe itself intact because it was surrounded by glass and iron." (de Certeau 1988:114)

Certeau's despair of the holiday as a disengagement from a meaningful place, and his example of the workplace as a richer environment in which we can contest and engage with the production of space is comparable to the problem of cutting off a building site from its context. The choice to isolate a building as they are being built at a local address, is akin to teleporting it away to a beach resort in Spain for the duration of its construction. Latour's model of the social through Actor Network Theory is also placed within a sensitive model of space and identifies the futility of understanding social networks from a distance, suggesting that only through close connection can social systems be nurtured and valued.

"It's not that there is no hierarchy, no ups and downs, no rifts, no deep canyons, no high spots. It is simply that if you wish to go from one site to another, then you have to pay the full cost of relation, connection, displacement, and information. No lifts, accelerations, or shortcuts are allowed." (Latour 2005:176)

At present the construction of buildings is distanced from its social and environmental context, if architecture wants to connect the social networks that are present in the construction of a building to local networks, architecture must find ways to shorten this distance between building site and people. With this in mind the author references the Arch-OS project as have practical strategies in getting over the fence that surrounds the building site.

Arch-OS and streaming the social

The author's experience of the Arch-OS system represents a methodological opportunity for digital systems to recover a social deficient within professional architecture. Although the system at the University of Plymouth was 'turned on' after the building had been handed over to the client, the use of the BMS (Building Management System) and computer networks represents the core of a potential creative strategy that satisfies some of Latours conditions for a socially reflexive system. Latour reminds us that the social is best understood as the passage of relations across a network;

"Society is not the whole 'in which' everything is embedded, but what travels 'through' everything, calibrating connections and offering every entity it reaches some possibility of commensurability. We should now learn to 'hook up' social channels like we do cable for our televisions. Society does not cover the whole any more than the World Wide Web is really worldwide." (Latour 2005/242)

Related to the Arch-OS strategy, is Hou Je Bek's blog www.urbanxml.com which documents the growth of RSS feeds that trace human activity across the world. More strategic in its efforts to support architectures 'environmental' communication across digital networks is Haque's and Leung's 'Extended Environments Markup Language' (www.eml.org) which constructs protocols to support collaboration and exchange

The formative work that Arch-OS and related systems have achieved in documenting the secret lives of buildings has began to provide the ingredients for evidencing the social networks that constitute spaces of work and play. The next challenge it would seem, would be to use these systems not just as visualizations of activity once a building has been built, but as systems to enrich the emergence of new spaces through pre-existing social networks and the networks involved in constructing a building. In this way perhaps architecture and construction would benefit from not pretending that a building site is invisible, but by locating its development within the networks that define a society, which may in turn lead to new and challenging forms of architecture.

"Once the whole social world is relocated inside its metrological chains, an immense new landscape jumps into view. If knowledge of the social is limited to the termite galleries in which we have been traveling, what do we know about what is outside? Not much." (Latour 2005:242)

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The Chemist as Flâneur in Intelligent Architecture

Paul Thomas.

Title: The Chemist as Flâneur in Intelligent Architecture

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The paper draws on the author's experience of a collaboration leading to the development and manifestation of the i-500 Project. The i-500 project is a public art commission for Curtin University's new Minerals and Chemistry Research and Education Precinct. The paper explores the potential for contemplation and reflection to be used as critical and enabling tools. The implementation of intelligent and responsive architectures will be used to transform the buildings scientific community into contemporary flâneurs.

The large-scale visual projections and the multiple auditory function of the artwork, reveal to the scientists and other occupants, a dialogue between their research community and an artistic translation of the dynamic data from physical and social interactions within the building into a volatile and evolving interactive artwork.

The i-500 system feeds off the activities of the research community, interpreting social flows of the occupants, whilst reading data supplied from the building's technological infrastructure. The work itself will have its own autonomy and exist independently of the technologies used to make it seen and heard. The project team anticipates the i-500 generating subtle and emotive experiences that can transcend this text through the evolving, dynamic and interactive software and network.

Charles Baudelaire is credited with firstly describing the flâneur in his 1863 essay *The painter of modern life* (Coverly, 2006 p 58). The role of the flâneur is someone who is part of the city by immersing themselves within it. The flâneur evolves his understanding of the city space over time and reflects the city as well as being reflected by it. The flâneur lives out a role of the 'detached observer who becomes intoxicated' by the cities movement (Coverly, 2006 p 58). The role of the flâneur transformed the city space into one where the urban wanderer seeks to find 'the true nature that lies beneath the flux of the everyday' (Coverly, 2006 p 13). The flâneur explored the space between the macro and the micro to evolve through a phsycogeographic [1] exchange.

The concept of being confronted by the advance of modern technology is not new. In Baudelaire's story "*The Lost Halo*" (1862) an artist loses his halo whilst crossing the street in a modern city 'I was crossing the boulevard, in a great hurry, in the midst of a moving chaos, with death galloping at me from every side.'
(Berman, 1983)

Marshall Berman demonstrates "The archetypal modern man as we see him here, is a pedestrian thrown into the maelstrom of modern city traffic, a man alone contending against an agglomeration of mass and energy that is heavy, fast and lethal" (Berman, 1983 p 159)

This account by Baudelaire demonstrates the social change that had taken place whereby the flâneur confronted with the modern city, can no longer maintain the role of the detached observer. The machinic age is dealing more with the transfer of quantitative data that can be controlled, packaged and exported.

Lissa Roberts states that as the eighteenth century was drawing to a close

"chemists increasingly subordinated their bodies to the material technology of their laboratories and began erasing the presence of direct sensory evidence from public records of their discipline's literary and social technologies."
(Roberts, L. 2004)

Roberts demonstrates the ubiquitous nature and reliance on the machinic to be able to understand contemporary living. The i-500 artwork's potential is to represent the visualisation of quantitative scientific research as part of the architectural environment. The visual and auditory function of the artwork reveals to the chemists a qualitative temporal experience of their research. Nested at the physical building's heart, in an area that acts as a central hub for the social interactions of the scientific community, the i-500 enables a zone of contemplation and reflection. The system evolves through a dialogue between the research community and the translation of the dynamic data from physical and social interactions within the building.

The i-500's dialogical evolution will act as an antidote to the contemporary forces that propel our comprehension of generative scientific research data. The constructed mediated understandings of the future are witnessing an every increasing collapse of physical space in favour of data space. These forces were developed in the eighteenth century where chemists were relying on mathematical and technical data over their senses in understanding material properties.

The contemplative mirror of the i-500 project sets the stage for the chemists flâneurs, enabling them amble through the space perceiving subtle rhythms or recognise complex patterns. The i-500 allows for the consideration of the subtle qualitative aspects of being human in the face of emergent technology. The mathematical contribution of quantitative data is seen here as the source material for a reconfiguration of a sensory experience.

The building highlights the need for researchers within i-500 to use the agency of their bodies with the world as a natural part of any scientific investigation. The users environment subconsciously informs a phenomenological understanding that in turn will inform the interpretation of mathematical data.

The i-500 audio visual presentation will perform a vital and integral role in enabling the role of qualitative scientific research in the fields of nano chemistry (atomic microscopy and computer modeling), applied chemistry, environmental science, hydrometallurgy, biotechnology, and forensic science.

Visual representations do things: they can sit quietly and be observed; they may aid in the performance of some activity, let's say, in science; they may act as repositories for previously compiled information; they may, through the format of their presentation, guide users or readers toward new ideas, or new practices. In science, and in chemistry particularly, visual representations are vital components of the material culture of practice.
(Cohen, 2004)

Benjamin Cohen suggests the visual function of an artwork reveals to the chemists the material culture of practice. The enriching experience can act as the chemist flâneur wanders by the artwork in the central foyer creating 'repositories… guiding the users or readers towards new ideas, or new practices'. (Cohen, 2004 p 41) The work also has the potential to filter through individual computer screensavers creating an audiovisual reverberation of the work that can spread between buildings.

The visualisation of all the collect data displays the sum total of its parts being processed to form a whole context. The chemist flâneur is exposed to rhythms and pattern recognition that will be personified through the flâneurs presence in the artworks. The chemist flâneur is in a loop where the research is transformed into a sensorial experience generated from the formulaic mathematic principles that shift the chemist away from the embodied experience. The generative durational visualisation creates a diary of the users interface with their architectural environment. The visualised data from the various research related inputs through contemplation and reflection can create architectural awareness that can redefine the space for the chemists to re-absorb the social.

The chemist flâneur is confronted in the i-500 project with a controlled conscious melding of the quantitative aspects of contemporary chemistry with its traditional sensorial aspects. By constructing the chemist as a flâneur two major shifts are confronted, the quantitative and the qualitative are brought together through the imprint on the architectural surroundings.

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