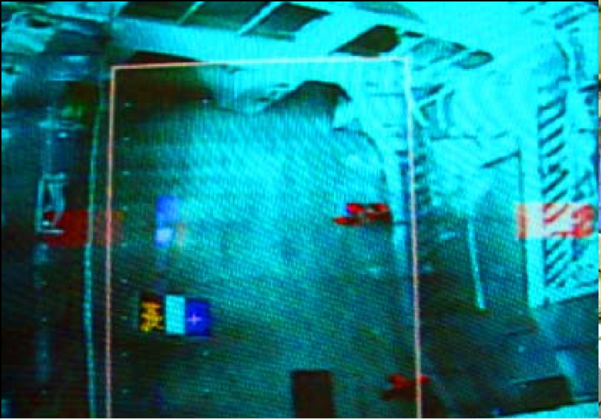


International workshop: AHO+BARTLETT= i-DAT

25th - 27th February 2009

A trans-disciplinary research workshop on Arch-OS

Arch-OS / Sloth-bot / Vision Tool...

Introduction

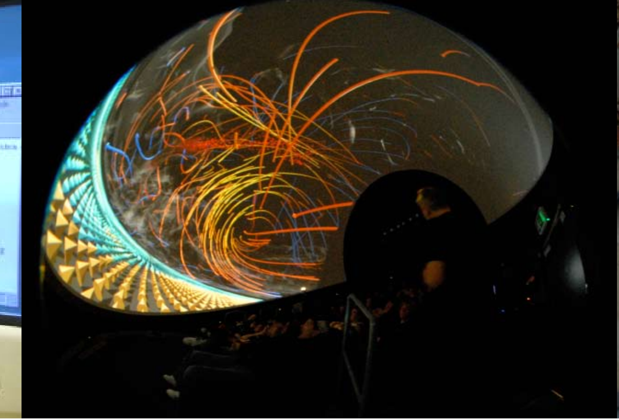
Architectural ecologies: from aesthetics to behaviour, an interdisciplinary approach to affecting the relationships and interactions between inhabitants and their architectural environment.

This workshop will experiment with and forecast potential future use, impact and value of using 'data' generated by a building and its inhabitants, to recursively influence behaviour, creating a symbiotic ecology with a potential greater environmental awareness. Through an interdisciplinary approach it will encourage the development of an organic list of solutions or potential methodologies for building design based on the study of the main factors: behaviour, data and interaction. The resultant hybrid construct has the potential to expand and evolve our physical and conceptual space, and behaviours and interaction within these.

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. In such a state the space boundaries and thresholds maintain a dynamic pluralism between contemporary tectonic architecture and abstract environmentally generated data.

Buildings have often been studied whole in space, but never before have they been studied whole in time. The 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.

Arch-OS - Core/Image Processor...



Context

The workshop will use the Arch-OS system (www.arch-os.com) as a starting point for this investigation. Current literature on Intelligent Buildings suggests an ideal of a building as an autonomous system that controls its internal and external environments. The model, whose origin lies with early models of artificial intelligence, effectively treats the building as a slave to human needs, and appears to vest more intelligence in the building than its occupants. Arch-OS exemplifies an approach of seeing environments as extensions of human sense, by increasing building occupant's consciousness of their environment.

With this ecological model of Intelligent Building we can now question the autonomy of the building from its users. Sensors within the building yielded data for processing by the system, which in turn actuated equipment that affected the environment.

The Arch-OS project was created to enable a greater transparency and understanding of the complexity of modern buildings and the relationship between its inhabitants and their behaviour. The system enables building occupants to reflect on the environmental impact of their interactions, both physically and through the extended social interactions enabled by communications technologies. Through the acoustic and visual representation of their social activity combined with live representations of data generated by the electro-mechanical and environmental activities of the building, occupants are able to better understand the complex relationships that exist between each other and their environment.

Immersive Vision Theatre / Tornado Simulation, NCSA. image: Aqeel Akbar...

Task

The workshop is structured in four phases:

1. Requirements definition and behaviour interpretation
2. Data collection
3. Data visualisation and experimentation
4. Organic list of solutions or potential methodology

Keywords: data, sustainable architecture, building management systems, data visualisation, architectural systems, organic behavioural patterns, ecology and environment.

Before you arrive we will collect last weeks data from the building, which will include temperature levels, Co2 levels and motion capture, for you to use as your blueprint for your architecture…

The Arch-OS system is essentially an open source reader of the building energy management system. By using data from a building as it is being used, can we develop architectural spatial strategies that will shift and adapt to this residue of the building. Each group will work closely with a specialist Digital Art & Technology student to develop different spatial proposals for the building. Your designs should manage and manipulate this spatial residue as a transient occupant of the building. One of the most important questions one should ask is why? Also, what does your proposal change of shift in the building? Does your proposal suggest a subtle architecture that can be only read through the reader a.k.a Arch-OS.

By studying a fragment of the life of a building's history through data collection. What can we as designers learn?

Arch-OS Workshop: Atria B / PSQ...

Terminal
File
Edit
Scrollback
Font
Window
Help
...ww.signwave.co.uk/html/auto — tcsh (ttyp1) — ⌘1
Rendezvous
CASM

Schedule

Workspace:
Babbage 213.
i-DAT (B312/323 Portland Square).
Immersive Vision Theatre.
Green Screen - Portland Screen.

Wednesday 25th February
1300: Workshop introduction - Immersive Vision Theatre.

1345: Arch-OS data distributed/ Site Reconnaissance - Portland Square building.

1415-1800: Six groups: generation of 4D manifestations of the past model.

Thursday 26th February
1000-1200: Prototype sketch shown in the immersive vision theatre of all six groups

1300-1800: Projecting and recording prototypes within the Portland Square building.

Friday 27th February
1400-1800: Project presentations - Immersive Vision Theatre / Green Screen.
1800: Drinks at Cuba Bar

Project Team

i-DAT

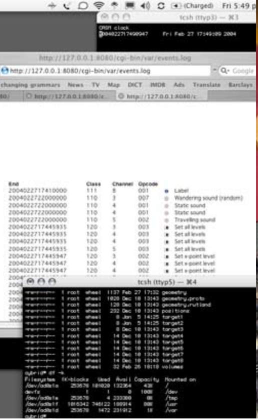
Birgitte Aga
Pete Carss
Gianni Corino
Mussaab Garghouti
Lee Nuttbean
Shaun Murray <shaun.murray@plymouth.ac.uk>
Mike Phillips <M.Phillips@plymouth.ac.uk>
Chris Saunders

AHO Staff

Per Kardvedt
Joakin Skajaa
Tomas Stokke
Magne Magler Wiggen

Students

Group 1: Bartlett / AHO / UoP	Green Screen
Group 2: Bartlett / AHO / UoP	Immersive Vision Theatre
Group 3: Bartlett / AHO / UoP	Green Screen
Group 4: Bartlett / AHO / UoP	Immersive Vision Theatre
Group 5: Bartlett / AHO / UoP	Green Screen
Group 6: Bartlett / AHO / UoP	Immersive Vision Theatre


(Charged) Fri 5:49 p
tcsh (ttyp3) — ⌘3
http://127.0.0.1:8080/cgi-bin/var/events.log
Google
changing grammars News TV Map DICT IMDB Ads Translate Barclays
tcsh (ttyp5) — ⌘4

```
CASM clock
20040227174909947     Fri Feb 27 17:49:09 2004
```

```
End                Class   Channel  Opcode
20040227174100000  111     5        001      Label
20040227220000000  110     3        007      Wandering sound (random)
20040227220000000  110     4        001      Static sound
20040227220000000  110     4        001      Static sound
20040227220000000  110     5        002      Travelling sound
20040227174459335  120     3        003      Set all levels
20040227174459335  120     4        003      Set all levels
20040227174459335  120     4        003      Set all levels
20040227174459335  120     5        003      Set all levels
20040227174459347  120     3        002      Set x-point level
20040227174459347  120     4        002      Set x-point level
20040227174459347  120     4        002      Set x-point level
```

References and Resources

- Anders, P., Phillips, M. 2004. Arch-OS: An operating system for buildings. In proceedings of the 2004 AIA/ACADIA Fabrication Conference, Cambridge and Toronto, Ontario, Canada. 8-13/11/04. pp. 282-293
- Mc Taggart, Lynne. The Field. London: HarperCollins Publishers, 2003.
- Murray, S. Disturbing Territories. Hamburg: Springer Wein New York, 2006.
- Phillips, M. Speed, C. Arch-OS v1.1 (Architecture Operating Systems), Software for Buildings. Engineering Nature, Art & Consciousness in the Post-Biological Era. Ed Ascot, R. Intellect. ISBN 1-84150-128-X. p 177-182. (2006).
- http://www.arch-os.com/downloads.html
- http://www.i-dat.org/toolbox
- http://www.r-o-b-about.com/en/biennale2008.php

Equipment

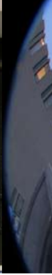
Software (Action script, Processing, XML …)
Still and video cameras with Fish Eye's.
Six digital projectors
Six video cameras
Two inflatable domes
Digital Media Labs (PC/Mac) equipped with a range of digital media software.

BMS Data

19:45:03 27/01/2
mA_control_valv
ac.uk/xml_descri
27/01/2009 18.7
trol_valve bms_.
xml_description.
27/01/2009 28.7
trol_valve bms_.
xml_description.
27/01/2009 40.6
bms_.E_MainMe
php?source=bm
os.scce.plymoutl
19:37:51 27/01/2
Meter_BlockC br
xml_description.
arch-os.scce.plyr
19:37:51 27/01/2
LectureB_CO2 br
scription.php?so
os.scce.plymoutl

Arch-OS / CASM Terminal Screen...

ColourWeb - dormant state...



n

2009 http://arch-os.scce.plymouth.ac.uk/xml_description.php?source=bms_.Atriu-
ve bms_.AtriumA_control_valve 19:37:50 27/01/2009 0 http://arch-os.scce.plymouth.
iption.php?source=bms_.AtriumA_heating_flow bms_.AtriumA_heating_flow 19:37:50
http://arch-os.scce.plymouth.ac.uk/xml_description.php?source=bms_.AtriumB_con-
AtriumB_control_valve 19:37:50 27/01/2009 0 http://arch-os.scce.plymouth.ac.uk/
.php?source=bms_.AtriumB_heating_flow bms_.AtriumB_heating_flow 19:37:50
7 http://arch-os.scce.plymouth.ac.uk/xml_description.php?source=bms_.AtriumC_con-
AtriumC_control_valve 19:37:50 27/01/2009 0 http://arch-os.scce.plymouth.ac.uk/
.php?source=bms_.AtriumC_heating_flow bms_.AtriumC_heating_flow 19:37:50
1 http://arch-os.scce.plymouth.ac.uk/xml_description.php?source=bms_.E_MainMeter
ter 19:37:51 27/01/2009 103.36 http://arch-os.scce.plymouth.ac.uk/xml_description.
s_.E_Meter_BlockA bms_.E_Meter_BlockA 19:37:51 27/01/2009 186.92 http://arch-
n.ac.uk/xml_description.php?source=bms_.E_Meter_BlockB bms_.E_Meter_BlockB
2009 -88.52 http://arch-os.scce.plymouth.ac.uk/xml_description.php?source=bms_.E_
ms_.E_Meter_BlockC 19:37:51 27/01/2009 18.28 http://arch-os.scce.plymouth.ac.uk/
.php?source=bms_.Elec_A_YDay bms_.Elec_A_YDay 19:37:51 27/01/2009 278.64 http://
mouth.ac.uk/xml_description.php?source=bms_.LectureA_CO2 bms_.LectureA_CO2
2009 -151.86 http://arch-os.scce.plymouth.ac.uk/xml_description.php?source=bms_.
ms_.LectureB_CO2 19:37:51 27/01/2009 2 http://arch-os.scce.plymouth.ac.uk/xml_de-
urce=bms_.LectureC_CO2 bms_.LectureC_CO2 19:37:51 27/01/2009 -189.86 http://arch-
n.ac.uk/xml_description.php?source=bms_.LT1_AirHum bms_.LT1_AirHum 19:37:51

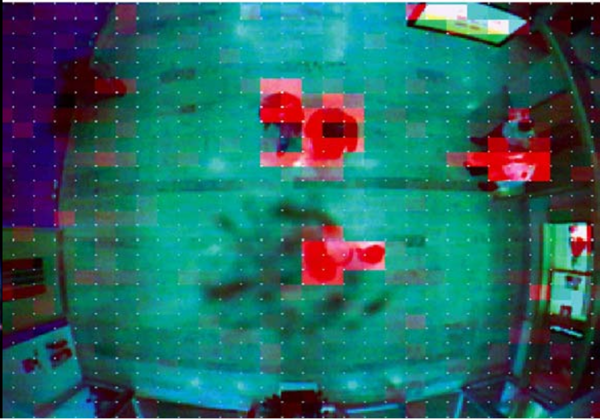
Uniview / Immersive Vision Theatre: image: Aqeel Akbar...

Vision Data

19:46:32 27/01/2009 http://arch-os.scce.plymouth.ac.uk/xml_description.php?source=vis_atria_a vis_atria_a 18:03:05 25/11/2008 [29, 31, 34, 31, 38, 41, 48, 31, 41, 43, 36, 42, 32, 19, 26, 23, 18, 14, 16, 12, 37, 30, 15, 22, 25, 28, 27, 20, 16, 25, 27, 40, 28, 18, 36, 18, 22, 26, 34, 17, 29, 23, 20, 19, 16, 24, 37, 28, 32, 36, 23, 21, 0, 21, 25, 23, 21, 34, 33, 26, 34, 16, 33, 30, 13, 10, 37, 31, 29, 40, 30, 33, 34, 39, 27, 24, 26, 30, 32, 22, 30, 41, 17, 28, 23, 29, 40, 43, 54, 22, 21, 28, 32, 24, 28, 30, 45, 31, 39, 23] http://arch-os.scce.plymouth.ac.uk/xml_description.php?source=vis_atria_b vis_atria_b 18:02:20 25/11/2008 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0] http://arch-os.scce.plymouth.ac.uk/xml_description.php?source=vis_atria_c vis_atria_c 21:55:38 25/11/2008 [28, 51, 17, 1, 2, 0, 0, 0, 0, 0, 100, 60, 16, 8, 89, 30, 5, 0, 0, 0, 79, 100, 24, 10, 65, 92, 65, 30, 5, 0, 86, 87, 32, 3, 100, 89, 100, 89, 60, 9, 100, 80, 69, 10, 54, 100, 100, 66, 47, 69, 65, 100, 56, 9, 11, 31, 56, 100, 78, 85, 91, 83, 100, 4, 16, 27, 16, 100, 100, 89, 100, 100, 100, 47, 72, 53, 100, 98, 100, 89, 98, 100, 100, 79, 97, 98, 46, 58, 85, 88, 100, 93, 55, 100, 100, 100, 100, 36, 18, 52] http://arch-os.scce.plymouth.ac.uk/xml_description.php?source=vis_lobby_a vis_lobby_a 10:57:55 27/08/2008 [4, 13, 0, 3, 3, 8, 8, 7, 5, 14, 23, 13, 29, 9, 13, 2, 12, 11, 8, 39, 3, 7, 7, 4, 14, 13, 14, 22, 1, 0, 3, 12, 10, 10, 9, 13, 18, 34, 11, 11, 18, 6, 13, 1, 0, 30, 10, 11, 11, 10, 20, 11, 15, 11, 15, 14, 21, 19, 0, 0, 8, 17, 30, 9, 15, 24, 15, 14, 11, 10, 9, 9, 21, 0, 0, 9, 11, 23, 16, 18, 21, 12, 21, 21, 16, 13, 12, 14, 0, 0, 7, 16, 29, 12, 19, 12, 29, 23, 26, 12, 12, 10, 23, 0, 0, 9, 19, 11, 14, 20, 16, 18, 37, 21, 18, 11, 16, 20, 1, 0, 8, 12, 12, 12, 20, 30, 15, 25, 15, 11, 10, 9, 34, 0, 3, 1, 16, 17, 12, 19, 13, 24, 32, 16, 15, 9, 17, 41, 1, 0, 3, 13, 14, 15, 18, 20, 29, 12, 12, 17, 9, 23, 30, 1, 7, 8, 26, 21, 19, 16, 36, 19, 23, 7, 10, 9, 14, 11, 1, 18, 16, 23, 11, 10, 21, 13, 44, 26, 17, 16, 10, 14, 36, 11, 6, 5, 27, 12, 8, 43, 24, 17, 34, 15, 13, 14, 14, 16, 16, 0, 6, 12, 7, 15, 50, 34, 17, 29, 21, 11, 14, 13, -999, -999, -999, -2997]

GreenScreen [inside] - Atria A / PSQ...

Immersive Vision Theatre: image by James Veale...



Arch-OS Vision Tool...

Source Data

http://arch-os.scce.plymouth.ac.uk/real_index.html

```
<html>
<head>
        <title>Arch-OS: Plymouth (UOP)</title>
</head>
<body><span class=”sub_heading”>Generate XML<br></span>
                        <a href=”xml_data.php”>All Data</a>
                        <a href=”xml_data.php?source=all_bms”>BMS Data</a>
                        <a href=”xml_data.php?source=all_vis”>Vision Systems Data</a>
                        <a href=”xml_data.php?source=all_web”>Web Traffic Data</a>
                        <a href=”xml_data.php?source=all_net”>Network Traffic Data</a>
                        <a href=”raw_data.php”>All Data</a>
                        <a href=”raw_data.php?source=all_bms”>BMS Data</a>
                        <a href=”raw_data.php?source=all_vis”>Vision Systems Data</a
                        <a href=”raw_data.php?source=all_web”>Web Traffic Data</a>
                        <a href=”raw_data.php?source=all_net”>Network Traffic
<span class=”sub_heading”>Arch-OS.com Live Data<br></
                        <a href=”live_data.php?refresh=5”>Live Data</a><br>

</body>
</html>
```

i-DAT.org: http://www.i-dat.org/

Immersive Vision Theatre

BA/BSc Digital Arts and Technology: http://b.i-dat.org/
BA Fine Art
BSc Multimedia Production & Technology:
MA / MSc / MRes Digital Art & Technology: http://m.i-dat.org/
MA Performance Practice

Advanced Architectural Design, AHO Oslo School of Architecture and Design, Norway: http://www.aho.no/en/

A.V.A.T.A.R, Bartlett School of Architecture, University College London, UK: http://www.avatarlondon.org/

i-DAT.org