

# Angelo Vermeulen

## BIOMODD [ATH<sup>1</sup>]

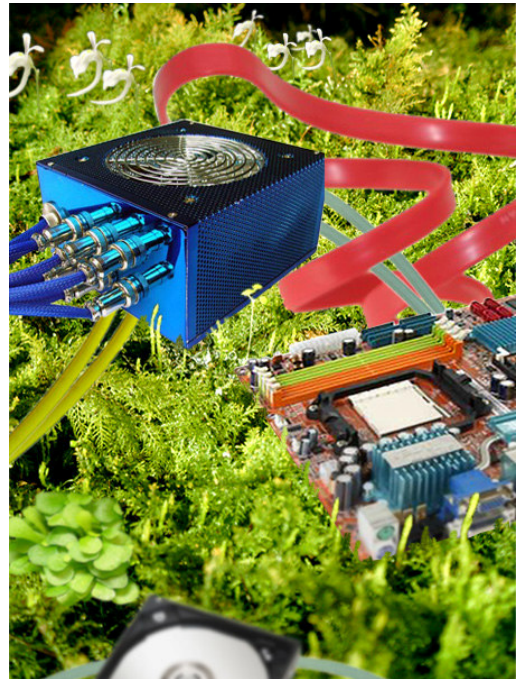
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### 1. Project description

Biomodd is an art project that reflects man's attitude towards technology: never satisfied with the status quo, machines are endlessly evolved, systems are boosted and performance gets violently pushed. Overclocking of computer processors becomes a metaphor of contemporary society; a society fascinated by growth and productivity but at the same time generating massive amounts of excess heat. Biomodd tries to visualise and rework the intricate relation of organic life, consumption and technology.

Biomodd is a social and interactive art project connecting ecology and contemporary game culture. The main idea is to build a customized ecological computer system as an expanded form of the bio installations I have been working on the past few years. In these installations various creative constellations of living organisms and technology are put together: setups with microscopic algae being exposed to extraterrestrial radio waves<sup>1</sup>, an organic living audio mixer in urban public space<sup>2</sup>, a micro-evolutionary interactive installation created with engineers and ecologists<sup>3</sup> etc. Apart from ecology, computer game culture is another source of personal artistic inspiration resulting in game audio performances and installations<sup>4</sup>. Biomodd is the first step to bring together both domains.

Inspired by the case modding scene, a large custom computer system is built as a form of expanded sculpture. Case modding is the modification of a computer chassis (often just referred to as the case). Many people, particularly hardware enthusiasts, use case mods for aesthetic purposes and to illustrate a computer's power. In case modding, computer components are often severely overclocked. Overclocking is the process of forcing a computer component to run at a higher clock rate than was designated by the manufacturer. Overclocking is practiced to increase performance but as a side effect generates large amounts of heat. And it's exactly this excess heat that is central in the project. For Biomodd an atypical monumental case is created that refers to my former bio installations (see photos below). The structure is partly transparent and is illuminated from the inside by LEDs and small fluorescent tubes. Inside the computer case the



<sup>1</sup> "Observatorium [LVN<sup>1</sup>]" (2003), "Proudly made in the USA" (2003).

<sup>2</sup> "RMX<sup>2n</sup>" (2004).

<sup>3</sup> "Blue Shift [LOG. 1]" (2005) was presented in 2006 at the ISEA conference in San Jose. Info on <http://01sj.org/content/view/536/146/>

<sup>4</sup> These projects have been presented in collaboration with Canadian artist Louis Blackburn under the name of Drumlander. A Drumlander DJ performance in Brussels from 2006 can be viewed at [http://www.imal.org/Art+Game/expo/fr/links\\_images/louis\\_angelo.html](http://www.imal.org/Art+Game/expo/fr/links_images/louis_angelo.html). Drumlander is also featured in this online interview: <http://www.we-make-money-not-art.com/archives/009350.php>

heat is recycled by an elaborate living ecosystem. In a first step experiments are conducted with mosses and other vegetation typically used in vivaria, and transparent cooling systems containing microscopic algae. The computer is as such transformed into a greenhouse and a living, pulsating cyber sculpture.



Visual research for 'Biomodd [ATH<sup>1</sup>]'. Top row: former bioinstallations with algae and microecosystems, 'Observatorium [LVN1]' (2003), 'RMX<sup>2</sup>' (2004), 'Blue Shift [LOG. 1]' (2005). Bottom left: case modding with LEDs and acrylic glass; multiple monitor setup; case modding with Lego® bricks. Bottom right: a so-called "wall crawling pc", all components are mounted individually with against a wall using VELCRO®; pc mounted in an aluminium tool box. Images: personal photos and internet.

Biomodd is an elaborate endeavour and contains different subsequent layers. Apart from an ecological statement, it is also an explicit social project. The Biomodd structure is built together with a group of local biology, game and art enthusiasts and is essentially a collaborative effort. In a second stage, the computer structure is used as a server for a computer game equally developed with the group. The objective of the game is to bring some of the main themes of Biomodd into an unusual multiplayer game experience. The computer sculpture is positioned at the centre of the exhibition space while along the walls individual computers are hooked on to the server. In this way, exhibition visitors can join in the multiplayer experience and become part of the installation. Through playing, they actively modify the piece by generating heat and thus influencing the interior ecosystem.

Biomodd is not a project with a classic art object-oriented focus. It is rather conceived as a nomadic project that will be set up in different places and countries, each time with different collaborators and new equipment. Like this, each version will have its own specific character and a wide range of different people can be invited to collaborate. Parts of previous versions will

always be recycled and integrated in each new structure. There is no final product to be realized. The travelling, social and evolving nature of the project is essential.

At the @Lab, the first version will be realised: 'Biomodd [ATH<sup>1</sup>]'. The expertise and technical possibilities at the lab and the fact that the lab is part of a university are extremely interesting factors. The objective is to work during eight weeks with a motivated group of students and collaborators at the @Lab. Consequently, a two-week open lab is set up in a university-related art gallery. Development of the project will continue during this gallery stage but all processes and actions become visible to the outside world and the project becomes a public performance.

## **2. Production team composition**

Ideally, the project would be realized with a team of about 15 students. It seems appropriate to try and cooperate with different university departments and schools: the GRID Lab, the School of Electrical Engineering and Computer Science, the Biofuels Research Lab, the Department of Environmental and Plant Biology, the Department of Biological Sciences, the School of Telecommunications. However, I would also send out a general invitation to all other university students. Apart from that, support of an external electronics specialist, professional case modder and/or vivarium specialist would be very valuable too. Possibly related hobby organizations in the Ohio region could be contacted.

### **2.1. Working with OU students**

For students working on the project there will be two complementary ways in which everybody is invited to participate. The computer structure and game will be designed both through group discussions and through practical hands-on development. I do not expect every person to be knowledgeable about all aspects of the project. On the contrary, the goal is to combine forces, backgrounds and expertise of different people into one coherent group experience. To accomplish this, the discussion sessions will be facilitated through Open Space Technology. Check [OpenSpaceTechnology.org](http://OpenSpaceTechnology.org) for more information about this interesting approach of group dynamics. For the hands-on work, students will be invited to work both in the @Lab and on their own (for e.g. software programming).

### **2.2. Potential OU partners**

The following is a list of specific support issues that I would like to address to each different university department or school.

#### **GRID Lab**

Codesign of a new multiplayer computer game or mod of an existing game

Game description:

- a multiplayer environment that is graphically and/or conceptually inspired by the ecological theme of the project
- the game can be very simple and conceptual (e.g. 'The Marriage' of Rod Humble<sup>5</sup>) or more elaborate (e.g. 'The Endless Forest' of Tale of Tales<sup>6</sup>)
- the game concept will be developed through group discussions with all involved students (including students from other departments such as Biology and Engineering)

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<sup>5</sup> <http://www.rodvik.com/rodgames/>

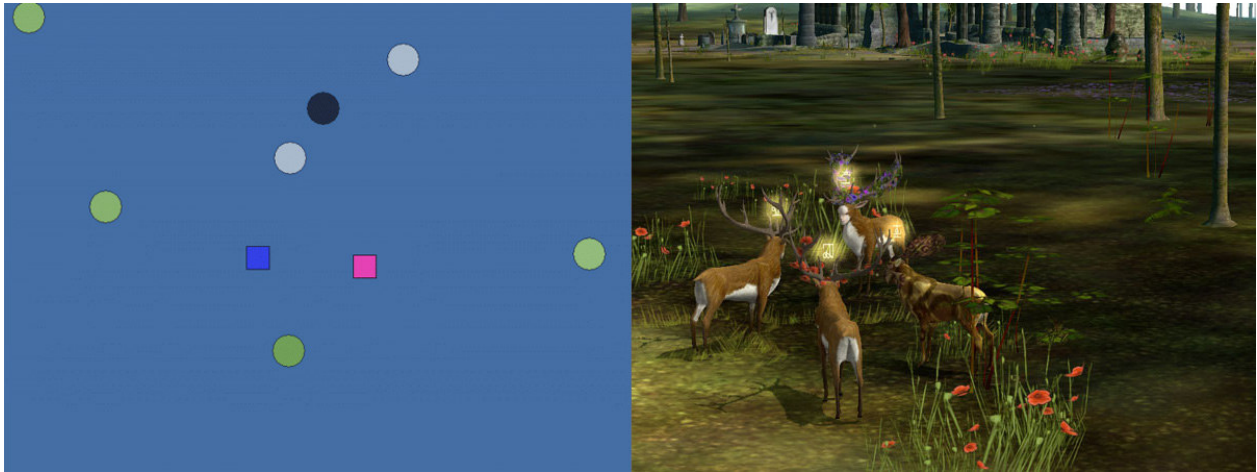
<sup>6</sup> <http://www.tale-of-tales.com/TheEndlessForest/>



- a more profound interaction with the ecosystem than just heat exchange can be envisioned:
  - a feedback system in which parameters of the developing organisms are fed back into the virtual world; in this way a metaorganism could be created living in both worlds simultaneously
  - an interactive system using simple forms of robotics to manipulate the ecosystem ('The Telegarden' is a classic example<sup>7</sup>)

Technical support/feedback in:

- creating a monumental semi-transparent computer structure that can harbor a living ecosystem
- overclocking of computer components and the subsequent harvesting of generated heat



Screenshots of the games 'The Marriage' and 'The Endless Forest'. Examples of an abstracted and more complex visualization of a virtual ecology. Images: Gameology.org, Tale-of-tales.com.



Left: 'The Telegarden', an interactive art work by Ken Goldberg and Joseph Santarromana from 1995. 'The TeleGarden' is an art installation that allows web users to view and interact with a remote garden filled with living plants. Members can plant, water, and monitor the progress of seedlings via the movements of an industrial robot arm. Right: Lynx 6, a relatively inexpensive robot arm developed by Lynxmotion. Images: Queue.ieor.berkeley.edu, Lynxmotion.com.

<sup>7</sup> <http://queue.ieor.berkeley.edu/~goldberg/garden/Ars/>

## ***School of Electrical Engineering and Computer Science***

Codesign of:

- a monumental semi-transparent computer structure that can harbor a living ecosystem
- a system for harvesting computer generated heat
- simple mechanics using valves and ventilators to transport heat within compartments of the structure
- simple robotics to manipulate the interior ecosystem (e.g. a robot arm for mobile water and nutrient dispersion)

### ***Biofuels Research Lab***

Investigate energy conversion and biomass production within the system.

Include carbon sequestration concepts.

Explore the sustainability aspects of the project by e.g. including solar panels and fuel cells.

### ***Department of Environmental and Plant Biology/Department of Biological Sciences***

Technical support/feedback:

- how to create a vigorous ecosystem within the confines of a semitransparent computer structure of about 3 m<sup>2</sup>
- how to transform heat generated by an overclocked computer system into vegetation biomass
- how to use simple robotics to manipulate an ecosystem (e.g. 'The Telegarden')
- how to apply an array of sensors to provide an interactive computer system with data about the health and growth of the ecosystem

The ecosystem will possibly be a combination of:

- a simplified system with mosses and small-sized local vegetation
- a more complex ecosystem with small-sized local vegetation
- a more complex ecosystem with tropical/exotic vegetation (e.g. a miniature rain forest)
- algae cultures, possibly used within a computer water cooling system that circulates the algae throughout the structure



Left: miniature interior ecosystem with different plant species designed by Terra5designs. Computer water cooling with an external radiator. Images: Terra5designs.com, Zalman.com.

***School of Telecommunications***

Codesign of the multiplayer game.

Recording of the whole process using video and photography.

Setting up and maintaining a project blog or website.

**3. Materials and external technical support**

During my first visit to the @Lab in March 2007, I was immediately inspired by the technical possibilities. Here's a preliminary selection of equipment and techniques that may be useful for the project:

- different camera's, to be installed within the system, especially the thermal camera system seems very appropriate
- video projectors, could be used to create a video installation in a separate space/location with live feeds from the installation
- large computer displays, could be used as a live backdrop for aquariums
- theatre lights, for plant growing
- rapid prototyping, useful both for the case modding and as an output result, the evolution of the system could be translated in 3D and then printed
- motion capture, for the game development
- general hardware: podium tables, OU University Surplus

Since the design of the physical computer structure will be the result of the group discussions, it is difficult to fully anticipate all needed materials. The following list is a preliminary overview of desired equipment and support:

- basic DIY tool set
- basic tool set for electronics: fine screwdrivers, pliers, soldering etc.
- custom-sized glass aquaria: fabrication to be outsourced
- Plexiglass: cutting and gluing to be outsourced
- laser cutting: would be needed for more elaborate shapes and aesthetics
- support for the electronics is needed: possibly this will be resolved through partnerships with Electrical Engineering and/or the GRID Lab
- support for the creation of small interior ecosystems: possibly this will be resolved through the partnership with the Biology Department; however, involvement of a vivarium specialist would be very valuable as well

**4. Showcases in Belgium**

The following Belgian art organizations will be setting up a live link with the @Lab and show documentary footage during three consequent exhibitions:

- Witte Zaal, Ghent, October 2007<sup>8</sup>
- 'Nano Now', De Loketten, Vlaams Parlement, Brussels, November 2007 (in cooperation with MuHKA, Antwerp, Belgium)<sup>9</sup>
- 'Digital Art in Belgium', BUDA, Kortrijk, December 2007<sup>10</sup>

<sup>8</sup> <http://www.kunst.sintlucas.wenk.be/wittezaal/index.html>

<sup>9</sup> <http://www.vlaamsparlement.be/vp/engels.html>

<sup>10</sup> <http://www.budakortrijk.be/>

## 5 Proposed timeline

In a first stage, the project will be developed at the premises of the @Lab. Consequently the project will be moved and displayed in one of the gallery spaces in Athens in January. During this stage, development will continue. Since I have a part-time job as an advisor (of masters thesises) in Sint-Lucas Visual Arts in Ghent, I have to spend one or two weeks in Belgium.

Week	Activity	Location
September		
13-16	GGOBOT new media festival	The Netherlands
week 4	residency week 1	@Lab
October		
week 1	residency week 2	@Lab
week 2	residency week 3	@Lab
week 3	residency week 4	@Lab
week 4	residency week 5	@Lab
November		
week 1	residency week 6	@Lab
week 2	residency week 7	@Lab
week 3	residency week 8	@Lab
week 4	student advising	Belgium
December		
week 1	studio work	Belgium
week 2	studio work	Belgium
week 3	residency week 9	@Lab
week 4	residency week 10	@Lab
January		
week 1	residency week 11	Athens gallery space
week 2	residency week 12	Athens gallery space

## 6 Contact

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