Sonobotanics

IPSO-FACTO

Institute for Predictive Sonobotanics
Foundation for the Auralisation and Computation of Transient Objects

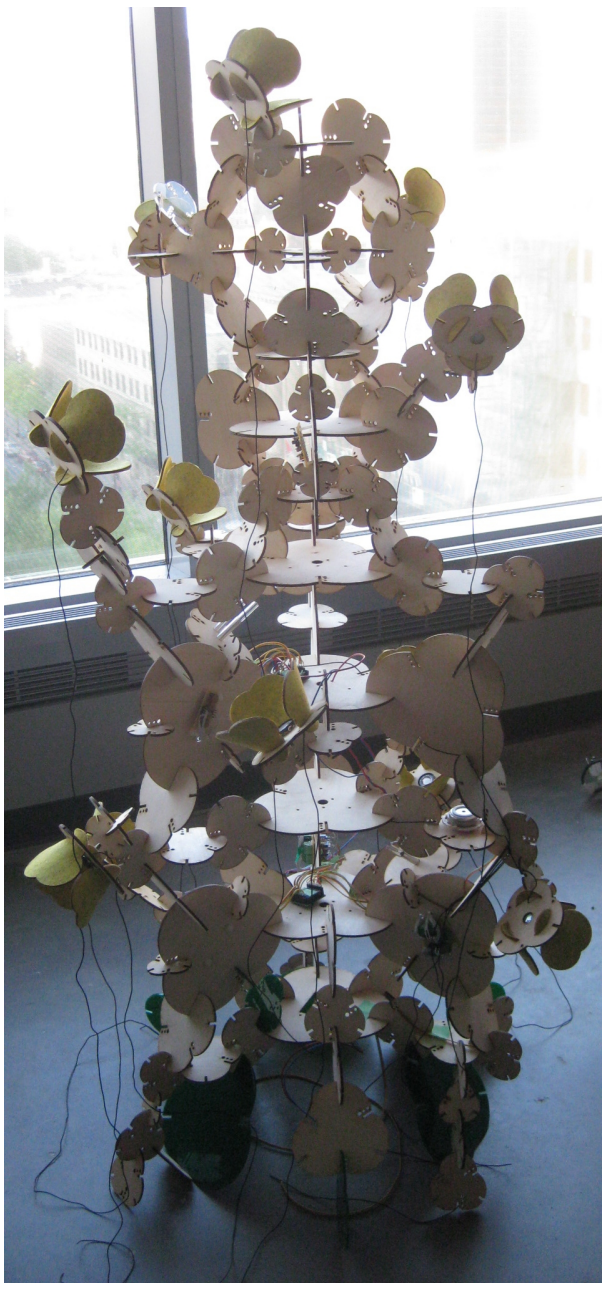
HTTP://WWW.SONOBOTANICS.ORG

Marije Baalman and Elio Bidinost

Sonobotanics is still a widely unknown science; it studies plants whose life experience is predominantly in the auditory domain. Since the 1970's Dr. Hortensia Audactor has carried out the core research in this area. Despite difficulties encountered in the publication of her results, she has collected a substantial body of research about the growth patterns, communication behavior, and other characteristics of these plants.

Recently, the field of Predictive Sonobotanics has been founded, attempting to create models of the plants with the aim of predicting the behavior of sonobotanic plants and to gain a deeper understanding of the subtleties in sonobotanic plant behavior.

In the exhibition models of the Periperceptoida Triquetrus Nutandis and the Periperceptoida Triquetrus Dependis are presented.



The models shown in this exhibition have been created by the Institute for Predictive Sonobotanics using modern technology: sensors measure environmental characteristics, such as light, temperature, humidity, touch and sound; these data are used in computational models implemented in the sonic programming language SuperCollider; the result of these is then auralised via the loudspeakers inside the physical model. As the domain of Sonobotanics, and even more so Predictive Sonobotanics, is still considered controversial in some academic circles (questioning its validity as a "true" science), the researchers have chosen to use their contacts in the art world to bring the plants into contact with a larger audience, in order to expose their models to realistic environments.

Marije Baalman

Born in Pingjum, Frisia, the Netherlands, Marije was from a young age interested in (re-)creating realities. In her youth she mostly created these in stories, but as a surprise to some people in her surroundings, when going to university, she chose to study Applied Physics at the University of Technology in Delft. Her study there was accompanied by an engagement in role playing, a form of improvisation theatre. After a one-year course in Sonology at the Royal Conservatory in The Hague, Marije moved to Berlin to engage in the creation of sonic realities by the use of Wave Field Synthesis, on which she got a Ph.D. in 2008. Meanwhile, she had started creating models of creatures in computation and sound (e.g. "Scratch" in 2004), and so it was no wonder, that when she met Alberto de Campo during his guest professorship at TU Berlin, and - during some late night discussions in the studio - heard about de Campo's true motivations to become a composer, his story about the plants - up until then mostly considered children's fantasy by others - caught Marije's interest to create a model of these plants. She searched in the more obscure botanic literature for references to these plants and - coincidentally - came across the name of a distant relative of hers, now widely known as Prof. Dr. Hortensia Audactor. Gaining access to (then largely unpublished) scientific descriptions of Periperceptoidae and its variants, Marije set out to create models of these intriguing plants. After founding the Institute for Predictive Sonobotanics with Alberto in 2005, followed with numerous exhibitions across Europe of the first models, Marije moved to Montreal, where she met Elio who was eager to join in the Institute to model sonobotanic plants from the Southern hemisphere.

Elio Bidinost

Global citizen Elio Bidinost, grew up with Italian parents in South Africa, where he was quite fascinated by the flora of the African lands. After pursuing a career in film in the UK, he studied Design and Computation Arts at Concordia, and has been running the SensorLab at Concordia. Learning about the work Marije did on Predictive Sonobotanics in Europe, Elio was eager to contribute with his design and physical computing skills to create new sonobotanic models of Periperceptoidae found in nature only in the Southern hemisphere.

The creation of the models for the Periperceptoida Triquetrus Nutandis and Dependis was kindly supported by Robocut.
http://robocutstudio.com

robocut

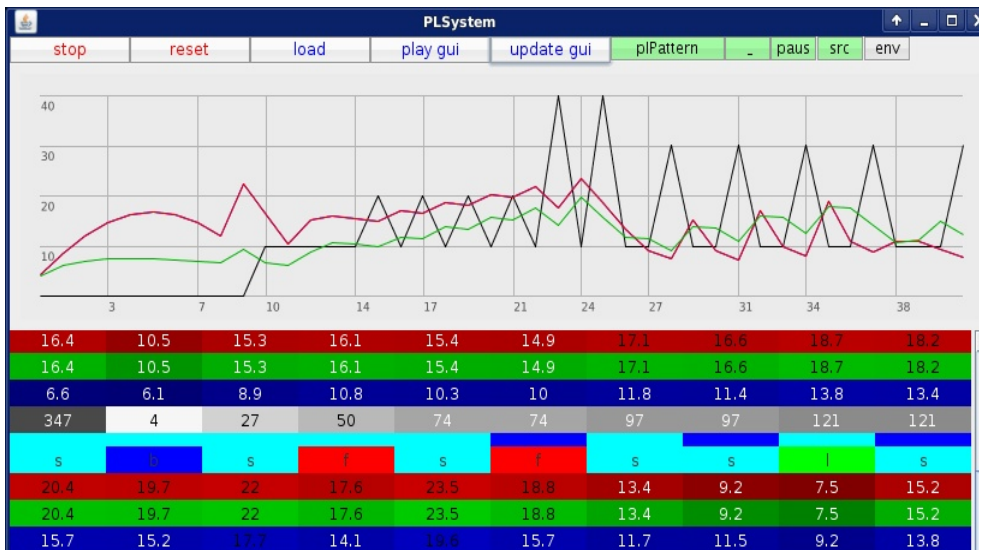
Modeling methods

The models consist on one hand of a physical model, assembled from plywood, acrylics, felt and electronics, and on the other hand a computational model.

The materials are shaped --- in an abstract way --- after images of the real plants, as they have been observed in nature. The electronics are functional and made to mimic the senses of the real plants, by using capacitive sensing for measuring touch, using light, temperature and humidity sensors for environmental data, and a microphone for sonic data. The sensor data is gathered using the SenseStage wireless sensor boards. These boards are also used to control various physical, visual and sonic aspects of the model output, namely the turning of the plant towards the sun, the colour shade changes based on the emotional state, and the sonic diffusion.

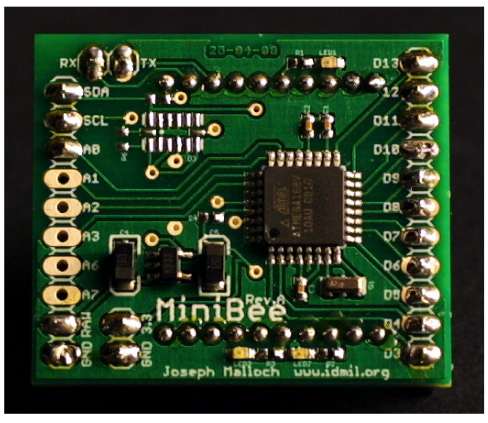
The computational model is based around a parametric Lindenmayer system, with elements for the plant's roots, stem, buds, leaves and flowers. Using realtime sensor data as inputs to this system, the model calculates how the environment changes the internal structure of the plant, and thus modeling the growth of the plant.

References:
The Algorithmic Beauty of Plants, *Przemyslaw Prusinkiewicz and Aristid Lindenmayer*, Springer Verlag, New York, 1990



SENSE/STAGE

HTTP://SENSESTAGE.HEXAGRAM.CA



SenseStage is a fully integrated hardware and software infrastructure that is intuitive to use for artists and designers, is scaleable to many nodes and performs data acquisition, transmission, conditioning, sharing and compositional tasks all within the same system.

The project consists of three components:

Wireless Sensor Hardware

A series of small, battery powered wireless PCBs that can be worn on the wrist, sewn into clothing, or embedded in objects. They can acquire and transmit input from a range of analog and digital sensors.

Data Sharing Environment

An open source software environment that enables the real-time sharing of such sensor data among designers. Collaborators subscribe to any data streams they want to use, and supply data streams of their own for use by other collaborators.

Real-Time Control Of Media

In development are modules that enable the analysis of such sensor data streams in order to provide building blocks for the generation of complex dynamics for output media.

The SenseStage technology is used both in the Sonobotanic models shown in the Cafe Congress, as well as for the beacons for the FoFa at Congress.

Beacon designs by: *Elio Bidinost, Kamel Haidar, Marije Baalman, Chris Salter, Jake Moore*

SenseStage is a research-creation project between Design and Computation Arts at Concordia University and the IDMIL, Music Technology at McGill University. Funding by grants from SSHRC and Hexagram.

hexagram

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