Organic Data Visualization: Mapping Amsterdam's cultural life with slime-mold

Workshop

Data visualization, intelligent design and art. During the Bio Data Visualization Workshop hosted by artists Sonja Bäumel and Maurizio Montalti at Mediamatic, participants engaged with slime-mold and made use of its cognitive skills in order to discover new patterns in the city, and create an organic map of Amsterdam's cultural life. Re-exploring and re-connecting Amsterdam's cultural hubs.

Data visualizations are changing the way people find and experience stories, the world of data taking on ever-changing shapes and characters. They help communicate complex ideas in clear, compact and beautiful way, take data and present it in visual shorthand. Data visualizations are usually made by usage of elaborated software programs and statistics. What happens when we exchange the computer program to an intelligent organism? Slime-molds are neither plants nor animals; their development cycle is unique. In it's growth process the slime-mold is able to locate the smartest route between food sources and spread out accordingly. At the University of West-England, researchers constructed an agar-map of the UK by placing oat flakes according to the geographical locations of the nine most populous cities in the UK. After introducing a slime-mold colony to the map, the organism started developing patterns which, surprisingly, aligned with the existing motorway design; however, with some variations. But how does it do this without a brain to process information? Researchers have not yet answered this intriguing question.

Amsterdam is made up of a myriad of elements: canals, homes, bike paths, train tracks, old shipping yards, bridges, and so forth. A beautiful and exciting place but sometimes it's difficult to find the shortest way to where you want to go, even if you've lived in the city for ages. At this workshop we employed the slime-mold to map out the larger network of cultural hubs in the city, illuminating the shortest paths from one to another. An organic map of Amsterdam's cultural life in slime.

By placing the slime-mold's favorite food, oat flakes, on those locations we wanted to connect on a map of Amsterdam made of agar, we intended to let the slime-mold find the ideal routes between them. In order to prevent other organisms from interrupting the slime-mold's growth process, it was necessary to work in a clean room. Luckily we built one for the Paddestoelen Paradijs exhibition. A clean room is a a space with a controlled level of contamination. That means it has very, very few particles in the air like dust. Participants wore white overalls, corresponding masks, gloves and plastic shoecovers, all to make sure none of their germs escaped into the area. Pedestrians walking by on the Vijzelstraat were very intrigued and highly amused by the sight, frequently stopping to peak inside. Meanwhile, participants got to play in their new, professional attire with different surfaces and food sources and lab gadgets. At the end of the day they had made their own, intelligent map of cultural Amsterdam.

For this workshop we used a vinyl cut-out shaped like the map of Amsterdam and stuck it to the bottom of a number of petri-dishes. Next time we will probably use a 3D printer and 'print' the agar in the shape of the map of Amsterdam in order to make the visualizations more accurate. For this, we are working together with the Fablab of our cultural partner Waag Society.

Text by **Pilar Puig** and **Evelyn Austin**

Workshop guests & authors of other visualizations

Sonja Bäumel (AT)

Sonja Bäumel's work includes art objects, living paintings, films, material research, costumes and product design. In her work she mediates between art and science, fashion and science, design and science, between clothes and body, between fiction and facts.

Sonja Bäumel is inspired by interdisciplinary basic research, especially by current developments in biology. Her works evolve from permanent confrontation with scientific data and facts which she often generates by herself in experiments and in research labs. She is driven by a fundamental fascination for organic life and coexistence in our planet.

Sonja's captivation for the human body made her to study fashion design at the Fashion Institute of Vienna. After graduating in 2004 she worked for two years in the trend and design department of an international jewellery company before she found the perfect supplementary education to follow and work on her own visions at the master program of the Design Academy Eindhoven.

Since then she has been totally focused on her own projects which were exhibited at the Museum of Natural History of Vienna, at the Milano Salone del Mobile or the Textilemuseum Tilburg/Netherlands. Her works had also been the basic impulse for documentary films (ORF/ARTE: Trailer: BioArt – Kunst aus dem Labor, Terra Mater) to which she actively contributed. In order to be able to give a pure view on the essence of things Sonja Bäumel doesn't want to refer to any existing definitions of body, fashion or beauty so to question alleged existing facts without prejudice. Her works, driven by perfectionism and executed with meticulous research, always leave space for the unexpected and often pose new questions because she allows the things to live.

Maurits de Bruijn (NL)

Maurits de Bruijn is a graphic designer working primarily in the field of new media (web design, application design and cd-rom design). In 1996 he graduated from Willem de Kooning Art School in Rotterdam as graphic designer and has been working as freelancer since then. He teaches information design and computation design at The Arnhem Academy of Art and Design.

As designer he likes to experiment and discover new design solutions for dynamic content. He always completely engineers his designs and he is convinced that design ideas can be found in both front-end (interface, look and feel) and back-end (scripting, engineering). Therefore, he has worked through all the necessary programming languages, such as JavaScript, php/mySQL, Flash ActionScript, Director Lingo and of course, HTML.

Abel van Gijlswijk (NL)

Abel is a visionary from unexplored northern parts of Amsterdam. He is employed as graphic designer at Mediamatic, one of Amsterdam's leading cultural foundations. Besides that, Abel is the capo of the notorious Dutch post-avant-garage-punkband 'THE DON'T TOUCH MY CROQUE MONSIERS'.

Joost Grootens (RS)

Joost Grootens studied architectural design at Gerrit Rietveld Academy in Amsterdam. As a graphic designer he is self-taught. His studio designs books in the fields of architecture, urban space and art, specializing on atlases, designing both the maps and the books themselves. Among his clients there are 010 Publishers, Nai Publishers, Lars Müller Publishers, Phaidon Press, Vanabbe Museum and Boijmans Van Beuningen Museum.

Grootens has won numerous prizes for his designs, among them the 'Goldene Letter' and two Gold Medals in the Best Book Design from all over the World competition in Leipzig. In 2009 he was awarded the Netherlands' most prestigious design award – the Rotterdam Design Prize. A monograph about his work titled 'I swear I use no art at all' was published by 010 Publishers in 2010.

Grootens is programme leader of the research programme Information Design at Design Academy Eindhoven's Master course. He has also lectured and conducted workshops at various institutions in Asia, Europe and North America. Joost Grootens is a member of AGI (Alliance Graphique Internationale).

Marco Hendriks (NL)

Marco is an Interaction & Information Media Design senior at the Art Academy of Arnhem Artez. During his internship at Mediamatic in Amsterdam, he was asked to join this project as one of the young designers.
www.marcohendriksportfolio.nl

Maurizio Montalti (IT)

Maurizio Montalti (founder and director of "Officina Corpuscoli") is a multidisciplinary designer, researcher, artist, and engineer interested in life and in bigger and smaller insights about it. He believes in the role of the designer as a bridge between different fields of action: particularly science, art, society, industry...

His work touches relevant design issues, such as the role which design could play in a biotech revolution in relation to sustainability, and to the novel possibilities that this marriage of disciplines could create in a future society.

The fascination for the micro-scale, together with his holistic vision of the world as a macro-organism and a strong belief in symbiotic relationships are some of his main drives. Through these explorations one of his primary aims is to question common behavior and to provoke critical thinking in regards to what we take for granted.

In such way, he uses design as a tool and a strategy for questioning culture.

His methodology consists of creating deep, analytical research, both theoretical and practical (hands-on), in order to be able to find novel inspirations, creating new perspectives and unprecedented thoughts, which, through the use of multiple communicative media, will end up as innovative design outcomes.

After graduating in 2010 at the IM Master course (Conceptual Design in Context) at the DAE -Design Academy Eindhoven, he founded "Officina Corpuscoli", a multidisciplinary studio, providing Creative Consultancy and developing both Conceptual and Commercial works, often being inspired by living systems and organisms. Amongst other places, Maurizio's work has been exhibited at the Triennale Design Museum (Milan, 2011), Audax Textiel Museum (Tilburg, 2011), Naturalis (Leiden, 2011), Mediamatic (Amsterdam, 2012). Officina Corpuscoli is currently based in Amsterdam, the Netherlands.

Workshop guests
Sonja Bäumel (AT)
Maurizio Montalti (IT)

Bio Data Visualization of Amsterdam's Cultural Heart

Data visualization is closely related to, yet different from information and statistical graphics and scientific visualizations. Frits Post, head of the Scientific Visualization research group at Technical University Delft, states it unites the field of the scientific and information visualizations. None of the data visualizations, however, has combined the two fields in such a way as this project.

Two weeks after the workshop participants gathered again to examine the results of the experiments carried out during the workshop. It turned out that even with the white suits, gloves, masks and other aseptic measures taken to keep organisms from growing and competing with the slime-mold, some bacteria slipped through at some point of the process, and altered the slime-mold's development.

According to Friedman (2008) the "main goal of data visualization is to communicate information clearly and effectively through graphical means. To convey ideas effectively, both aesthetic form and functionality need to go hand in hand, providing insights into a rather sparse and complex data set by communicating its key-aspects in more intuitive way. Yet designers often fail to achieve a balance between form and function, creating gorgeous data visualizations which fail to serve their main purpose — to communicate information." Slime-mold is, in all it's simpleness, an ideal medium with which to visualize these different kinds of data. Aesthetics is of course a matter of taste, yet the visualization is undoubtedly clear in mapping Amsterdam's cultural heart. Participants prepared two maps of Amsterdam. One of them was contaminated and is now a mosaic of textures and colors formed by the different microorganisms. The other, however, remained bacteria-free, letting the slime-mold to grow according to the shortest routes from oat flake to oat flake. A time-lapse was made recording the development of the slime-mold; it is amazing to watch the way the organism grows and explores, expanding in wave-like, yellow pulses that branch out in search of food. This time-lapse is now exhibited, together with the agar-maps, at Mediamatic's exhibition space Mediamatic Bank, and can be viewed online on http://vimeo.com/mediamatic/vimeo/bio-data-visualisation-cs and bio-data-visualisation-hq.
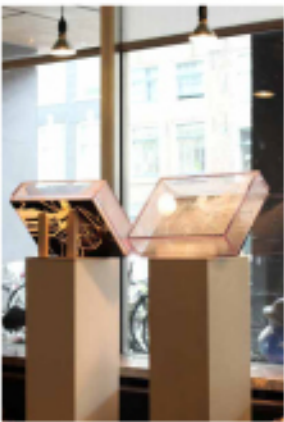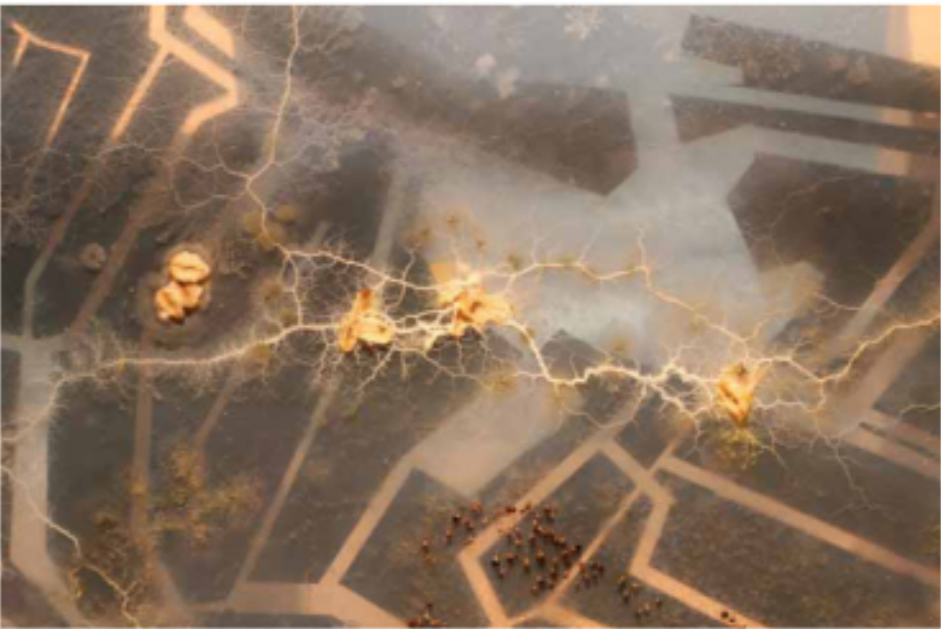
1 Frits H. Post, Gregory M. Nielson and Georges-Pierre Bonneau (2002). *Data Visualization: The State of the Art.* Research paper TU delft, 2002.

2 Friedman (2008) *"Data Visualization and Infographics"* in: Graphics, Monday Inspiration, January 14th, 2008