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SENSE
YOUR
CITY!

27 - 31 October 2015

Data Canvas: Sense Your City

National Gallery of Modern Art

Director's Note

National Gallery of Modern Art, (NGMA) Bengaluru, Ministry of Culture, Govt. of India, in collaboration with swissnex India, is glad to present the exhibition 'Data Canvas: Sense your City', a project developed by the swissnex network, Lift and Gray Area. The exhibition was launched in Geneva earlier in April 2015.

Data Canvas Exhibition, which has already been a success in Geneva, Shanghai, Shenzhen, Beijing and San Francisco aims at showing innovative visualizations on how citizens sense and make sense of their environment.

As an example, measures of pollution, dust, light, sound, temperature and humidity collected through the use of a sensor, have been incorporated into several winning projects.

The exhibition features some of the best, most visual and interactive pieces from the online competition. In addition, three Swiss artists have designed an immersive virtual-reality experience to guide the visitors through the exhibition and explore the data in real time.

I would like to thank all the participants for creating these powerful visualizations and also extend my gratitude to all the members of swissnex India for bringing this exhibition to Bangalore.

My sincere acknowledgement to Shri Sudhakar Rao, Chairman, Advisory Committee, NGMA, Bengaluru and all the members of the NGMA Advisory Committee for their unstinted support. My acknowledgements to Ministry of Culture, Government of India, and thanks to my colleagues at NGMA, Bengaluru for their sincere efforts in arranging this exhibition

Sathyabhama.Badhreenath
Director, NGMA Bengaluru

Data Canvas: Sense Your City

Curator's Note

Inside the comfort of our home, we control almost everything. From central AC and heating systems to air purifiers, humidifiers or essential oils diffusers, the quality of our living environment can be altered and mostly monitored. We invest money, time and energy in making these spaces healthy and pleasant for our minds and bodies.

Though, once our children, parents and loved ones exit through the front door, what kind of air are they breathing? What is the environment like on their way to school, work or daily walks?

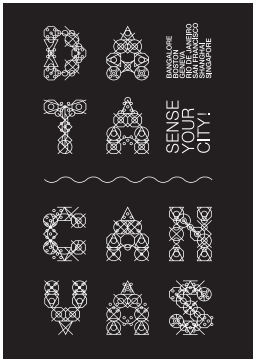
These questions have little answers when it comes to easily accessible public data. Even more, the quality and instantaneity of the information we do get vary vastly from one city/ country to the other. Is it safe, right now, to let my kids play in the yard? Not yesterday, not two hours ago, right now as traffic is reaching its peak and temperature is rising.

With Data Canvas: Sense Your City, we wanted to allow citizens to feed live data onto the internet and share their environment with the rest of the world. By being involved in the entire process, having assembled the sensors themselves and placed them outside of their homes, these volunteers gave a human perspective to facts and figures, which were then translated into beautiful and explanatory designs.

It is our hope that citizens all over the world will realize the urgency of understanding what their cities are like and ask governments, corporations and individuals to collect and share live environmental data online, open for everyone to access, in a manner that is easy to comprehend.

Lift, swissnex, Gray Area
Founders of Data Canvas: Sense Your City

YEAR OF SWISS INNOVATION IN INDIA 2015-16
swissnex India Consulate General of Switzerland
GRAY AREA
swiss arts council prohelvetia
VILLE DE GENÈVE



SELECTED
PROJECTS FROM
THE INTERNATIONAL
COMPETITION

DATA CANVAS:

Sense Your City

WINNER OF THE LIFT GRAND PRIZE

SONIC PARTICLES 2.0

Kasper Fangel Skov
Copenhagen, Denmark

Sonic Particles 2.0 is a real time sonification of urban environmental data. It translates the abstract data provided by the Data Canvas sensor network into an ever-changing musical representation to raise awareness of invisible and elusive environmental issues in urban areas. The composition is playing with harmony and disharmony, high and low pitched notes constrained by musical scales, as well as other rhythmic and ambient elements to reflect positive and negative aspects behind the data. Each city has its own unique ever-changing composition generated by the urban environment.

WINNER OF THE SWISSNEX GRAND PRIZE

IT FEELS LIKE

Lanke Frank Tarimo Fu, Danielle Griego, Nikola Marinčić & Jorge Orozco | ETH Zürich - Switzerland

It Feels Like provides users with a way of viewing their current weather conditions in an adventurous fashion. It takes current local weather information aggregated from Data Canvas nodes and compares this to a database of typical weather conditions from various cities in the world. Once a match is found with a far-away city showing very similar conditions during a particular season, It Feels Like presents the user with further visual information to explore. This project can help recollect feelings from an old vacation spot, serve as a guide to a potential future destination or introduce people to somewhere completely new.

WINNER OF THE GRAY AREA GRAND PRIZE

URBAN HEARTBEAT

Aurelia Friedland, Srivinas Ashok & Steve Pepple
San Francisco, USA

Urban Heartbeat is a civic art project that explores real-time temporal identities and pulses in cities around the world. The team began by conducting several audiovisual experiments representing selected environmental factors, such as pollution, noise, dust, and light. Experiments were combined into a search engine aiming to empower any citizen the ability to curate civic data, and compare them across 100 places in 7 international cities. Each search returns customized results in the form of information-rich, yet abstracted “pulses”.

SELECTED FOR EXHIBITION

SENSOR WEATHER CHART

Fraser Xu
Shanghai, China

This project uses several resources available online to increase readability of environmental data worldwide. It combines the data from the 100 sensors dispatched in Geneva, San Francisco, Boston, Rio de Janeiro, Bangalore, Shanghai and Singapore with the Yahoo Flickr Weather Project, which provides the background images for the cities. Finally, an overview weather is gathered from the Open Weather Map API. With the combination of these powerful data sources, the artist is able to provide visualizations of the data into three different views (overall, specific and compare) that the user can explore freely.

SELECTED FOR EXHIBITION

EMOJICITY

Michael Flückiger
Zürich, Switzerland

What if your city could express itself? Through a simple yet visually striking display, Emojicity gives you an update on how your city is doing. Used nowadays in almost all of our virtual interpersonal channels (online chat, smartphone, texts, etc.), emojis have become a tool to express emotions and emphasis. Easy to understand, regardless of language, they become the translators of intricate and detailed data sets in Emojicity. One look to your screen is enough to know the quality of the air in Geneva, San Francisco, Boston, Rio de Janeiro, Bangalore, Shanghai and Singapore, thanks to the smiling (or not) face looking back at you.

SELECTED FOR EXHIBITION

WITNESS DATA

Christina Doumpioti + Ermioni Natsi
Geneva, Switzerland & London, United Kingdom

Cities are more than what we see and experience through our everyday lives; they consist of invisible agents responsible for the air quality, humidity, temperature, dust, or light intensity. The artists envision a future where the built environment is informed and shaped by (environmental) data in order to create resilient environments for their citizens. Witness Data aims at visualizing a city capable of anticipating data and responding to them. This idea, as well as data retrieved from the monitoring systems, are communicated to the public through prints, a very common means of informing the citizens of Geneva.

SELECTED FOR EXHIBITION

CITY DOTS

Greta Dimitrova + Kiril Mandov I Morphcode
Sofia, Bulgaria

City Dots allows you to explore, compare and sense the patterns of your city. The interactive infographic visualizes data from the 100 sensors deployed in Geneva, San Francisco, Boston, Rio de Janeiro, Bangalore, Shanghai and Singapore. The aggregated data for each city is plotted as a collection of dots at a resolution of 1 hour. Each dot represents one hour of sensor data. 24 dots represent a single day. The Dotty Small Multiples allow the comparative to be presented in a single chart.

SELECTED FOR EXHIBITION

CLIMATE CHANGE

Martin Hertig | ECAL
Lausanne, Switzerland

Climate Change transforms the data from the Data Canvas network into 3D sculptures. Depending on the chosen parameters, the user can produce readable visualisations or pure “data-dada”. As default textures, the artist used emojis, nowadays common language. He wanted to explore if they can make sense in this context and if they could be transformed into something beautiful. This project allowed the artist to discover new programming languages. He also enjoyed creating his own tools, as a starting point to escape the boundaries of readymade software. In a future version, the artist would like to add the possibility to change textures and their behaviors in order to use the application as a tool to create datadriven artwork.

SELECTED FOR EXHIBITION

URBAN HARMONICS

Bryan Leister
Denver, USA

By now, anyone interested in the field of data visualization is familiar with the elaborate designs that show relationships between nodes in data – hierarchical edge bundling, nodelink trees, circle packing and the like. For this project, the artist chose a radical departure – to humanize the data and try to establish meaning. Urban Harmonics is an interactive dating game. You are the main character, and you set your preferences and tolerances for dust, light, pollution and more. The cities will come to you based on your preferences. Visual cues such as smoke, dust clouds and beads of sweat help you understand what quality each city is offering you.

SELECTED FOR EXHIBITION

DATACANVAS WEATHER TIMELAPSE

Jonas Lauener + Matthias Berger I ETH, Future Cities Lab
Singapore

Lying on a green field, surrounded by dandelions, watching the sky. Clouds are forming, reshaping, passing by. As scientists, the creators of Weather Timelapse were wondering what causes the clouds, the rain, and all those weather-related phenomena. What if they could keep a longer observation somehow recorded, in order to study the complex interaction between several parameters such as wind speed and direction, temperature, radiation, precipitation, pollution, etc., in a scientific manner? They equipped an SLR with a fisheye lens and customized firmware to record timelapse videos. The camera is mounted on a tripod, has a weatherproof casing and can run independently from the user. The result is a combination of what the camera captures at a rate of one picture per minute, overlaid with the data from the Data Canvas network.

SELECTED FOR EXHIBITION

WEATHER+

Kuan Butts & Daniel Palencia
New York City, USA & Singapore

The international Data Canvas: Sense Your City network of sensors inspired the artists to consider what a weather application might look like in the future. With the ability to know environmental factors at a very granular level, they imagined a new interface that accommodates the additional measured variables. It allows the user to explore environmental factors with the same ease of use as with present tools, but with more features. As the data is so granular and location specific, results would also need to be contextualized through map views. It could be done in a manner similar to the typical presentation of storm patterns within a region, but at the urban scale.

SELECTED FOR EXHIBITION

SENSOR ENGINE

Owen Powell
Solihull, United Kingdom

Sensor Engine is a visualisation of the sensor network, and includes example output for Boston, San Francisco, Singapore and Geneva. The images are created by an entirely automated process written using FME software and OpenStreetMap vector data. The first stage of the process creates the backdrop map for each city by dynamically reading map data based upon a latitude and longitude set for each city. Next, the model reads all sensor values at once and calculates statistics, so the images can visualize the data proportionally across all the cities in the chosen time period.

The images show:

- Time (hours are presented in the same time zone for each city, allowing for a direct comparison of the same time of day)
- Pollution (this represents the sum of ‘air quality’ and ‘dust’, and is shown as a white haze or smog. Transparency is used to show high and low values per city)
- Temperature (temperature values are shown colored with a gradient from orange (high) to blue (low))
- Noise (sound levels are shown as increasing and decreasing lines in the bottom left corner)
- Humidity (humidity values are shown as a set of radiating blue lines going from left to right, as values rise and fall)

The workspace creates a single image for each hour, which are manually compiled into animated Gifs, starting at 00:00hrs PST, and are intended to be displayed together in a series.

THE HIGHLIGHT PROJECT

CITYCELLS

Cassandre Poirier-Simon,
Baptiste Milési I Transmïi Studio &
Raphaël Munoz I Aprobado Studio
Geneva, Switzerland

Welcome to CityCells, the red thread of the exhibition Data Canvas: Sense Your City, presented by Lift India. Environmental sensors have been installed in seven cities of the world. CityCells offers the public an interactive journey through the virtual landscapes of these cities, generated by the environmental data collected.

The user moves in the exhibition from one marker to another. Each marker represents a city by displaying its name in a custom designed typeface. By pointing the tablet at the marker, the visitor discovers the substance of the relative city's cells. Pollution, noise, light, humidity, temperature, dust: all the environmental data spring out of the cities marker to appear in the exhibition space.

The geometric shapes generated represent information regarding the last two weeks, while the background landscape relates to the average of the last three months. The exhibition is conceived of as an ephemeral experience, it reveals numerical data that may seem abstract in a sensitive and artistic way by making them visual and connected to our unconscious!

University of Applied Sciences and Arts of Southern Switzerland
Department for Environment Constructions and Design

Scuola universitaria professionale
della Svizzera italiana

SUPSI

ADVENTURES IN DATA VISUALIZATION 2015

A summer workshop on open data, computational design and web technologies for creative people.

Under the supervision of:

- **Fabio Franchino**, computational designer and founding partner at ToDo
- **Serena Cangiano**, coordinator of the Master of Advanced Studies in interaction design at SUPSI

ADVENTURES IN DATA VISUALIZATION 2015

Adventures in data visualization is a summer workshop dedicated to explorations into the field of data visualization by means of computational technologies and design approaches. By accessing and manipulating open datasets, the participants design and develop projects that make raw data perceivable through digital or physical matters, transforming them into interactive experiences or into narrative flows. The projects can be built upon the use of storytelling, experimental or artistic approaches, and information design techniques: many can be the adventures in data visualization in the span of a five-day hands-on workshop.

The workshop activities are based on design, coding, and making sessions where participants develop a project individually or in teams. There are no design briefs or media constraints: the output can be a screen-based work, a projection based installation or a site-specific installation, a 3D printed or laser-cut structure.

The projects can be realized with an experimental or artistic approach or based on information design techniques.

A workshop of this type was held at SUPSI (University of Applied Sciences and Arts of Southern Switzerland) during the summer of 2015.

During the five-day workshop, seven projects/prototypes were developed through the use of D3.js library. The projects are digital applications accessible via browser and, in some cases, translated into physical prototypes made through the use of 3D printing and laser cutting technologies.

ADVENTURES IN DATA VISUALIZATION 2015

DROPPER

Claudia Ciarpella, Amedeo Spagnolo

Dropper is the interactive visualization that explores the relation between the rain and the levels of the lakes in three cities: Lugano, Locarno, Luino. The datasets' periods are the months of April, May and June 2015. By selecting the city and the data, the interactive animation shows how the levels of the lakes change.

ADVENTURES IN DATA VISUALIZATION 2015

FF-MM

Fabian Frei, Massimiliano Mauro

FF-MM is the visualization of the data about the air pollutants in the area of Pregassona, Lugano. The data are referred to 2014 and arranged according to seasons. Each pollutant is represented by colored circles: O3 is purple, PM10 is orange, NO2 is green. Every circle is a day of the year. The size and the opacity show the quantity of the pollutant in the air in a specific day.

FF-MM is also a physical data visualization: through the extrusion of bi-dimensional graphics generated with D3.js and the use of a 3D printer, the data were visualized with the shape of a plate where the circles array creates a tangible and lit surface.

ADVENTURES IN DATA VISUALIZATION 2015

LIGHT POLLUTION REPORT BY A SATURNIAN

Myoungeun Kim

Light pollution report by a Saturnian visualizes the annual data about the level of light pollution in Lugano. Each star represents the daily datum of light pollution in 2014. By placing the mouse on a star, it is possible to visualize the numeric value and the status of the Saturnian alien. If the pollution is low, the star does not shine and the alien shows a sad facial expression because he cannot find the way back home. If the level of light pollution is high, the stars shines and the alien is happy.

ADVENTURES IN DATA VISUALIZATION 2015

SOUND OF COMMUTING

Samantha Lim

As a sonically augmented visualization made in D3.js, the Sounds of Commuting to Lugano represents the traffic across the Swiss and Italian border in 2014. Open data on the volume of heavy and light vehicles at the border are translated into a number of wheels as well as the volume of traffic sounds (i.e. cars and trucks), allowing the viewer to experience the border traffic across the 12 months last year.

ADVENTURES IN DATA VISUALIZATION 2015

SUMMER IN THE CITY

Carola Bartsch

Data visualizations normally do not show the data of air pollution together with those of weather and traffic. The physical data visualization Summer in the City shows the daily data of temperature, insolation, rain and velocity of wind together with those of the amount of car and truck traffic on the highway near the town and those of PM10, nitrogen dioxide and ozone concentration in the air, that are published on the website of www.oasi.ti.ch. These data are visualized by colored rounded plates of different sizes, calculated by D3.js according to the data, and strung on a wire. The plates are cut with a laser cutter from semi-transparent plastic sheets, the structure consists of laser-cut acrylic glass panels.

ADVENTURES IN DATA VISUALIZATION 2015

SUPERMAIRO

Giorgio Olivero

SupermAIRo is a videogame that visualizes the data about air pollution, in particular the quantity of PM10 and PM2.5 in 2014 in Lugano and in the region of Beijing in China. The character jumps on a series of platforms, each of them representing the weekly data about the air pollution.

A second iteration on the prototype would allow to visualize the impact of the pollution on the behavior of the character that becomes weaker according to the variations of pollution.

ADVENTURES IN DATA VISUALIZATION 2015

USER PERCEPTIONS OF ONLINE SHARING SERVICES

Greta Castellana, Anton Fedosov

The project, realized with D3.js, visualizes the perception of a sample of users of on-line music sharing services. The “ideal users’ perception” according to the service is represented by the up-right cross of each single system. In all four cases the area of the users’ perception, identified by white circles, is far from the “ideal users’ perception”.

The dataset is obtained from an online survey conducted on a wide group of people with different nationality, age and profession by two researchers from USI (Lugano, CH) and TUT (Tampere, FI).

PROJECT IN THE SPOTLIGHT

GUEST INTERACTION DESIGNER

Thesis project, Master of Advanced Studies in Interaction Design, University of Applied Sciences and Arts of Southern Switzerland.

Under the supervision of Nicolas Nova, Future Cities Lab.

PROJECT IN THE SPOTLIGHT

ÉMOI

Soraia Binzagr I Soraia.is

“Émoi” is a service and data representation interface that takes advantage of today’s digital systems (i.e. e-commerce, ubiquitous computing, sentiment analysis algorithms) in order to reinvent the longstanding tradition of sharing and gifting chocolates as an expression of interpersonal attitudes and feelings.

émoi allows its user to create an edible representation of their emotions via a representation language that is based on research into the human gustatory and oral somatosensory experience. As a result, émoi lets the user communicate their sentiment using appropriately defined qualities of taste, texture, shape and color as presented through chocolate.

GUEST INTERACTION DESIGNER

BEST INDIAN PROJECT

Information Design Lab at IDC, IIT Bombay

GUEST INTERACTION DESIGNER

VISUALIZING TRAINS FROM METROS IN INDIA

Prof. Venkatesh Rajamanickam, Rasagy Sharma

How do the 4 metros connect India via trains? This project visualizes trains from the four Indian metros: Delhi, Mumbai, Chennai and Kolkata. Data about 600 trains that start from the 4 metros was used to map the starting and ending stations. By hiding the map, a skewed map of India emerges.

Using a small open data set — as well as an interactive medium — provides a visually rich experience of the connections built by the massive Indian railways network. This process not only highlights the vast coverage of the system, but also brings to attention potential areas for expansion, while emphasizing on the skewed form of the country being formed by mass migration to metros.

The project was first exhibited at Abhikalpana (January, 2015) as part of the work created under the Information Design Lab at IDC, IIT Bombay.

Think
Innovation
think
Switzerland

YEAR OF
SWISS
INNOVATION
IN INDIA
2015-16

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India
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lift

GRAY AREA

swiss arts council
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VILLE DE
GENÈVE