## http://www.sultra-barthelemy.eu/

#### RétinA / PICTONIQUE 2015/2018

*Houston Center for Photography, USA, 2015 Korea-France Year, 2016 Château de MONTMIRAIL, FRANCE, 2017 ESOF Toulouse, France, 2018 Musée ROTHKO, Létonie, 2018 Gand, Belgium, 2019* 

SULTRA&BARTHELEMY with François ROUSSEL Franck JUBIN\_Artilect Nazim FATES\_Inria/Loria, Nancy, France Institut de la Vision\_Paris LAAS (CNRS) Toulouse, France IRIT, CNRS Toulouse, France

## Province Rétina PICTONIQUE SULTRA & BARTHELEMY

# **RétinA PICTONique**

#### **RétinA**:

- Intends to expose the root of Sight, or to show Sight's beginnings (1% of vision).

- Materializes the decisive encounter between weaving (old technology) and digital technology.

Causes a collapse of the notion of image. \*

A minimal definition (a little over a hundred pixels), accompanied by an animated translation in black and white, produces this explosion: besides granting fabric the agency to emit images, we also privilege the continuity of the movement rather than deepening the forms themselves. The forms shown by our woven screens belong more to woven material and to electrical and photo energies than to surface-image. Indeed, we propose that the term «woven screen» be replaced by that of an imaging material connected to autonomous and asynchronous pixels.

#### RétinA in connection :

- Parallels the research on vision implants, performed at the Hospital for XV20s,

(Professor Sahel, Doctor team Saddek) - Inherits the latest CAD tools for weaving, with

the co-creator of Pointcarré software (Francois Roussel).

- Launches the program of cellular automata performed at INRIA-Loria of Nancy (Nazim Fates).

- Proposes to enter the technical tangle of seeing and weaving with the help of two philosopher-epistemologists

(Sacha Loeve and Victor Petit).

- Coordinates with the Toulouse FabLab, CNRS laboratory for innovative research in IT development and e-textiles.



#### INSTITUT DE LA VISION

Architect, city planner and designer, Jean-Michel Wilmotte founded his In the heart of the Quinze-Vingts National Eye Hospital, L'Institut wn architecture firm in Paris in 1975. He takes an interest in everyde la Vision is one of the most important research centers in Europe hing in equal measure: from the most improbable to the most obvious. on eye diseases. Conceived as a place for gathering and exchange, rom the top of the range to the most economical. This range of scale it brings together the three major players in the fight against visual and activity allows him to think afresh each time, always upholding the impairments: researchers, clinicians and industrial partners. Their same attention to detail. Art is everywhere in his life. An enthusiastic proximity enables a sharing of ideas and skills, while it precipitates collector, he regularly visits museums and contemporary art fairs in the emergence of new questions and facilitates the delicate process of France and abroad. The discoveries these visits engender are sources translating fundamental discoveries into new treatments. The goal of of inspiration for Wilmotte. Today, his business is structured around two l'Institut is to discover, test and develop treatments and technological ompanies – architecture firm Wilmotte & Associés and design studio innovations in order to prevent or limit visual impairment and to im-Wilmotte & Industries SAS –, operating more than 100 projects at any one time. Renowned for its diverse output and the elegance of its work, prove the autonomy and the quality of life of patients. In addition to a research center, it harbors a clinical investigation center, a rare diseas the Wilmotte firm operates in both the public and private sectors, across reference center and innovative new entrepreneurial companies. These luxury, hospitality, residential, and the service industries. The firm unites activities are developed within the legal framework of the «Voir & 207 employees of 21 different nationalities, and operates in 24 countries Entendre» Foundation. Established in Paris and Nice, its international development brought about the launch of two subsidiary companies: Wilmotte UK Ltd in London, and Wilmotte Italia Srl in Venice. The firm is also represented by an office in Seoul and Rio de Janeiro.



SOUK: Social Observation of hUman Kinetics Matthieu ROY / Gilles TREDAN



AAS

CNRS

Abstract : Simulating human-centered pervasive systems requires accurate assumptions on the behavior of human groups. Recent models consider this behavior as a combination of both social and spatial factors. Yet, establishing accurate traces of human groups is difficult: current techniques capture either positions, or contacts, with a limited accuracy. In this paper we introduce a new technique to capture such behaviors. The interest of this approach lies in the unprecedented accuracy at which both positions and orientations of humans, even gathered in a crowd, are captured. From the mobility to the topological connectivity, the open-source framework we developed offers a layered approach that can be tailored, allowing to compare and reason about models and traces. We introduce a new trace of 50 individuals on which the validity and accuracy of this approach is demonstrated. To showcase the interest of our software pipeline, we compare it against the random waypoint model. Our finegrain analyses, that take into account social interactions between users, show that the random way point model is not a reasonable approximation of any of the phenomena we observed.



Cooperative multi-agent systems Head : Marie-Pierre Gleizes / Frédéric Migeon Pierre Gleizes



Self-Adaptation - Self-Organisation – Emergence Complexity - Dynamics - Cooperation

ĨRI

Our main challenge concerns the design of complex systems for which the global behaviour emerges from the behaviours and interactions of the agents composing the system. Each agent has an individual goal and a behaviour based on a cooperative attitude. Since 1995, we studied an approach for the design of adaptive complex systems based on adaptive multi-agent systems and emergence. For this we elaborated a theory called AMAS (Adaptive Multi-Agent Systems) [Camps, 98][George, 04]. This theory gives local criteria to design agents so as to enable the emergence of an organisation in the system and thus of its global function. The adaptation of the system enables this function to change and is ealised by self-organisation of the agents. The cooperative attitude is the engine of this self-organisation since it guides, locally, the agents in its decision making.



RétinA partenariats et collaborations



ARTIECT\_FABLAB TOULOUSE

The Fablab Toulouse provides a space and the tools for multidisciplinary creation, sharing and dissemination of knowledge, and implemen tation of innovative projects. The Toulouse region is very active in the field of new technologies, both in regard to the scientific community and industrial sectors. There are many students, researchers, engineers and artists working in areas as diverse as IT, electronics, mecha nics, architecture, environment, chemistry, design, yet these people from different communities do not often collaborate. But nowadays. many innovative projects are the result of multidisciplinary collaborations. In Toulouse, the Fablab allows and encourages these collaborations to take place. A student or a project leader with an innovative idea will have the opportunity to meet others with complementary knowledge and skill sets to realize their project, and the team will have access to tools and resources to create a prototype. They may also shed light on other projects undertaken at the Fablah



RétinA - partenariats et collaborations

#### WILMOTTE & ASSOCIES

#### INRIA-LORIA\_NAZIM FATES

Nazim Fatés is a full-time researcher in the laboratory of the INRIA-LORIA Institute in Nancy, where he was also formerly a part of the Maia team. His research deals with the study of the robustness of complex systems, focusing on asynchronous and stochastic cellular automata and reactive multi-agent systems. He regularly collaborates with other professionals, publishing research in the last year on the reversibility of asynchronous cellular automata, and the analytical approximation of second order phase transitions. He has presented this work at the TAMC'14 conference and at ACRI'14, and in October of 2013 he held a visiting researcher position in Santiago, Chile, working with Pr. Eric Goles (Univ. Adolfo Ibañez) and Pr. Julio Aracena (Univ. Concepción)



**RETINA** \_ CHNO des quinze-vingts «SIGHT under construction» or «another SIGHT»

At l'Institut de la Vision, Professor José Alain Sahel and his team led by Dr Saddek have worked for several years on a project that has made significant advances since 2009. The ambition of their project was to give sight to persons with blindness through the implantation of an artificial retina. Through intensive rehabilitation, individuals with these implants have learned to move in space, using visual criteria for the first time.

This clinical experience plays on several fascinations: the equipment is a technical mediation (a learned, onboard camera) while as a prosthesis, it becomes a bionic body.

Hesitations and obstacles in the reconquest of sight, such as those encountered at Quinze-Vingts Hospital, will echo in the ways we «manufacture» the images that appear on our woven screens (polyester / optical fiber).

SIGHT is redefined What is this «perception» at the junction of medical and technological achievement?

Creating textiles that communicate has been the object of our long research. Recent retinal transplants on the other hand rely on the flat performance of Sight. Between these two attempts, we offer a hybrid form: textile / display, with perfect awareness and acceptance of the parameters that redefine Sight.

The idea that there could be two guests, two parallel avenues of research that face the same limitations is stimulating. Each obstacle recreates visual forms by submitting the object of vision to a fierce process of degradation. What is produced is on the one hand an artifact with little ability to effectively communicate, and the other, the simplified quality of the image transforms the content into signals and signs. We do not speak of sight, but only of our perception through the 60 cells that potentially inform our world.

## **CHNO\_Hôpital des Quinze-Vingts**



## Textile\_Screens To SEE

By recording situations, scenes of intense proximity (scenes that touch the eyes, are almost tactile), we try another take, another way of manufacturing the world that moves around us. The issue we seek to solve is how to enter the world at such a weak resolution. To do so, we must avoid choices, set aside the profusion of signs, dodge conflicts, work through delicate touches, clean by intense leveling. We must automate our simplifications and yet remain subjective to achieve a profoundly human interface.



Series 1 (2012-2013) : 6 textile-supported films

Series 2 (2014) : Refined samples 1 12 textile-supported films Movies 1-12

Series 3 (2014-2015) : Refined samples 2 7 textile-supported films







«I started with the idea that the form of a pathway could also be a form of writing, that a labyrinth signifying a path that always seems to be guided by strict boundaries, but every turn leads to dead ends and forces one to return, to pass the same places over and over again, to explore new directions and come across a new impossibility.»

Alain Resnais speaking about "L'année dernière à Marienbad", screenplay by A. Robbe Grillet

## BIG CRUNCH \_ Marienbad

«Last year at Marienbad» explores both interior and exterior spaces; the labyrinth of the French garden resembles the infinite baroque modulations of the inside of the chateau. These spaces seem to provoke more mental than visual deconstructions with narrative patterns that develop, overlap and unfold.

What Alain Resnais portrays is central to the experience we hope to create in deconstructing vision down to the very foundations of sight. The dynamic principle of our intention could be as follows: «If we do not remove all, if we do not complete the darkness, the little that remains will return ... and somehow, once again will become whole. «

This is the visual translation that we want to give to the sentence of the Marienbad player who, speaking of his practice with the very old game of Nim in the film, claims: «I can lose, but I always win.»

We explore these multiple layers to give a manyfaceted experience. This work is similar to that achieved at CHNO-XV20s. It consists of a combination of elements that blend:

Fragmented shots from Alain Resnais's film, enlarged and printed to the same dimensions as the textile-screens using adhesive film on glass.
A series of pieces echo the mathematical «Marienbad games» (a version of Nim) that are played in the film. The textile-screen supports are identical, but different images play across each.
A full translation / compression of the film that that retains the compression required by the materialization in textiles but projected large on an entire wall.







## WILLMOTTE & Associés SA architecture / design

## SIGHT as experience of direction:

Willmotte & Associates will assist our work to maintain a dialogue with the architecture of the exhibition space while also considering the changing, multi-layer images available on each textile-screen. The three-dimensionality of the textile-screens validates their ability to be both bodies and to reflect on possible relationships that they have as objects with the public who navigates them.



#### L'ADAM (2014-2015):

Wide-format video projection: 1920x768 pixels Full translation of the film by Alain Resnais: «L'année dernière à Marienbad,» 1h:40m duration

Textiloscope (2014-2015) : Unrolled textile Polyester / optical fiber: 300x2500cm

Untitled (2015): Adhesive film on glass : dimensions to be determined





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## **BEL HORIZON**

These objects that resemble both jackets and belts emit light and transmit information, while they also offer the wearer a shield within the language they project. These proto-garments have the capacity to speak to one another, and to play roles that are sometimes diametrically opposed to each other.

The elements of each are made on the same principles as the RétinA screens: weaving together polyester thread and optical fibers, we create series of programmable cells. With the bulk of 9, 12, 15, 18, or 30 layers of fabric, the vests appear simultaneously protective and threatening. The only cell available on each surface surrounding the thorax compliments the animations of elementary cellular automata. The vests can be coordinated with one another so that their language compounds and becomes more intricate as their numbers increase like complex living organisms.

We know how limited of the number of chemical elements that, interacting according to simple rules, allow for the emergence of complex behaviors of life. Using the same principles, we render the process of this emergence visible on the fabrics, with the expert guidance of INRIA-LORIA/Nancy (under the initiative of Nazim Fatés).

The human body must activate these textiles. Our intention is to entrust the mediation of these digital vignettes to true masters of movement: dancers and models from whose actions shamanic effects may emerge.





**BEL\_Horizon (2014-2015):** 10-15 proto-garments of polyester thread / optical fiber, animations of cellular automata (Nazim Fates) Battery, control board and integrated WiFi router. 40 x 85 cm each





#### dient Map Estimat

## INSTITUT de la VISION Partenariat

Ryad Benosman and his team work in both the fields of neuromorphic engineering and the analysis of vision and perception. They are studying complex systems of perception that involve the architecture, design, and use of different visual sensors that cover an omnidirectional amplitude, of rear field

cameras, of variable-scale and non-centralized sensors. They are interested in the

omnidirectional vision 836 (what is this?) and innovative cameras. More recently, they are analyzing the calculations performed within visual systems, and they seek to

understand the relationship between computational and biological vision. They now

specialize in treatment and neuromorphic vision, based on the capture of events.

## adient Map Estima



#### Scene Reconstruct

#### ORiSCAN,2014-2015

*Partnership with l'Institut de la Vision* 

Module dedicated to the public Dimensions to be Determined The installation incorporates the latest innovations of the Institute in terms of imagery and treatment of vision.



#### Simultaneous Mosaicing and Tracking with an Event Camera

Abstract

An event camera is a silicon retina which outputs not a sequence of video frames like a standard

camera, but a stream of asynchronous spikes, each with pixel location, sign and precise timing, indicating when individual pixels record a

threshold log intensity change. By encoding only image change, it offers the potential to transmit the information in a standard video but at vastly reduced bitrate, and with huge added advantages of very high dynamic range and temporal

resolution. However, event data calls for new

algorithms, and in particular we believe that

algorithms which incrementally estimate global scene models are best placed to take full

advantages of its properties. Here, we show for the first time that an event stream, with no

additional sensing, can be used to track accurate camera rotation while building a persistent and high quality mosaic of a scene which is super-

resolution accurate and has high dynamic range. Our method involves parallel camera rotation tracking and template reconstruction from estimated gradients, both operating on an event-by-event basis and based on probabilistic filtering.





Sentimental Journey

With textiles, we enter a curious materiality: at the intersection of the warp and the weft there is housed a kind of mediation. There is the combination of emotion and logic, the battle between nature and the laboratory, the codependence of signifier and signified.

Sentimental Journey is a project that borrows from research on cellular automata (INRIA-LORIA Unit, University of Nancy). In this research, initial figures were developed according to the rules of simple interactions to produce unpredictable phenomena. These models of collective phenomena are inscribed in the fibers of an industrial bolt of fabric that will develop its own stories at the same pace as it can be manufactured, to create a new iconography. This is the link between a discrete and an encoded model, re-materialized in weaving and a network of selected correspondence made within the macroscopic world from events, images or fictions. This confrontation creates a space that our emotional and cognitive faculties will fill and activate.

Si je suis éteint, je ne m'allume que si mes deux voisins sont identiques. si je suis allumé, je ne m'allume que si mes deux voisins sont différents.

## **Sentimental Journey**





Si je suis éteint, je prends l'état de mon voisin de gauche.

Si je suis allumé, je deviens allumé sauf si mes deux voisins sont allumés.



## Sentimental Journey 2 déroulé textile lié à la performance «BEL Horizon» Modèles de synchronisation (rappel des règles)

L'etat de chaque cellules correspond à une couleur définie parmi la palette des couleurs optiquement reconstituées avec 5 fils (C,M,J, noir et blanc). A chaque pas de temps toutes les cellules appliquent simultanément la règle suivante :

a) Je choisis :

soit de conserver mon état,

soit de copier l'état du voisin de gauche, soit de copier l'état du voisin de droite. b) J'avance de 1 la valeur de mon état

Sentimental Journey 2 (2016) rouleaux textiles dim : 150 x 2500 cm Automates cellulaire 1D 130 cellules au départ





722	195	104
164	193	170
164	191	193
181	164	193
193	164	174
193	173	164
178	126	100
178	100	126
147	100	178
100	171	178
100	178	116
178	178	100
177	175	70
70 1	123	01
70 1	127 1	177
107	70	127
103	70 .	121
127	10	89
127	88	10
117	38	2
117	2 4:	1
68 2	2 11	7
2 10	9 1	17
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117	113	2
176	171	32
32 1	176 !	58
32 1	165 :	176
115	32 :	176
176	32	80
176	76 3	32
222	96	10
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222 145 40 2 222	40 40 208 222 216	40 101 222 222 74 40
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