(FIG 1) Tiffany Holmes: Eco-visualization and wattage conservation (2009)

# ART AND SCIENCE RESEARCH@ZNODE

## PHD-PROGRAM

## LOCATED IN THE INSTITUTE FOR CULTURAL STUDIES IN THE ARTS

## ZHDK SWITZERLAND

hdk

Zürcher Hochschule der Künste
Institute for Cultural Studies in the Arts

The UNIVERSITY of PLYMOUTH

(FIG 2) Kirsten Johansen: art for astronauts on (ESA) space flights. (2010)

# MONIKA CODOUREY INTERVIEWS JILL SCOTT ABOUT Z-NODE

It all began in 2004 as a PhD research collaboration between the Institute for Cultural Studies (ZHDK) and the University of Plymouth UK. At Plymouth, Roy Ascott has already graduated more than 60 students who were focused on the relationship between Art and Technology. In the beginning we in Z-node only had 5 student researchers but after four years we had 18 researchers. We now have 3 groups focused on cultural themes that relate to discoveries and discourses in life sciences, one of our main interests. The three groups are: the arts and environmental science, the arts and sociology, neuropsychology and in the last group, arts and computer science (including Artificial Intelligence).

MC: There seems to be a focus more on the natural sciences in Z.node than in Plymouth– why is that so?

JS: These are times of great ecological change, social mobility and controversies about human health just to name a few challenges, and artists find them interesting to investigate. I do think that researchers joined the z-node program because they wanted to raise awareness about these issues in society and they needed to have access to the facts from natural scientific research to back up their practical interpretations. Over the years of running the Artist-in-labs program we have accumulated second supervisors who are scientists like Dr. Angeklia Hilbeck, who works in the Institute for Integrated Biology on GMO risk assessment or we have Dr Olaf Blanke, a neurosurgeon who explores the concept of embodiment at EPFL. These scientists are very open to discuss the potentials of art and design interpretations by artists. Some of our PhDs like **Tiffany Holmes**, **Monika Codourey**, and **Nicole Ottiger** actually became more interested to conduct further research of their own based on their residency experiences in the Artist-in-labs Program. Today, many topics that effect society are influenced by current scientific discoveries, and these artists and designers want their results to be scientifically robust in order to address various ethical and social issues accurately.

MC: But why should artist or a designer do a PhD about critical and ethical discourses in the sciences that effect society?

JS: Well "should" is very problematic word, but they might like to! Some artists and designers have feelings of responsibility to comment on social

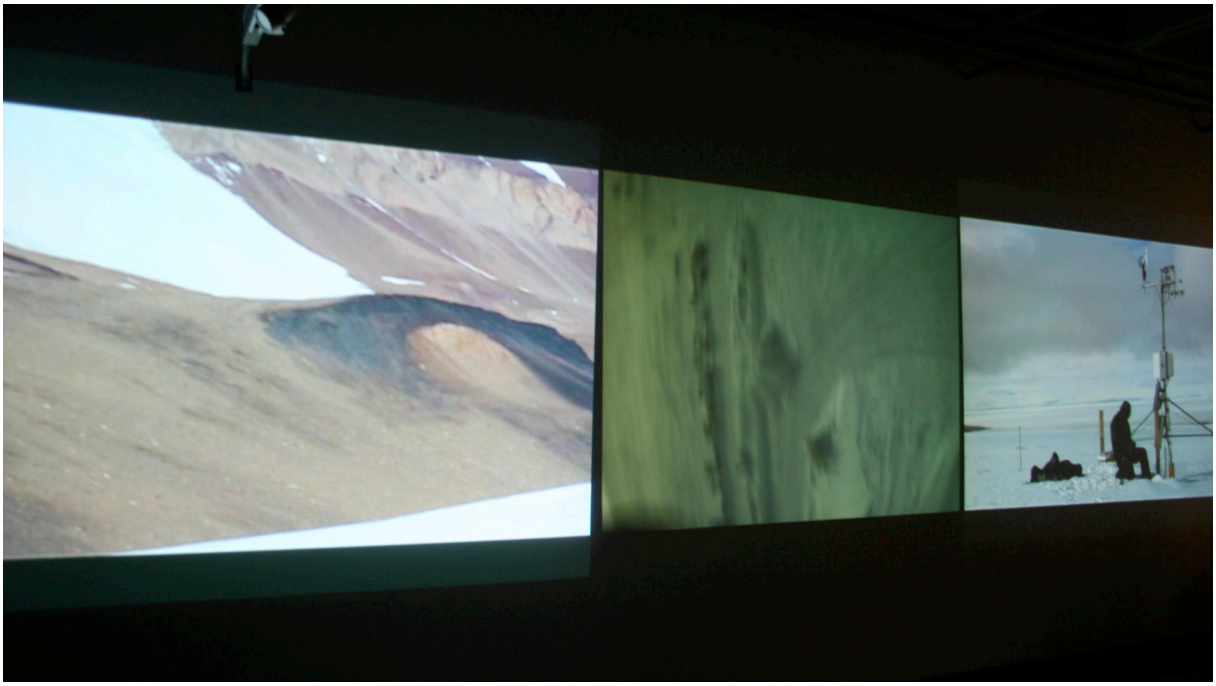
and ethical perspectives from their subjective positions. The challenge is how to represent these controversies and interpret scientific discoveries. But they do seek to be inspired by scientists and their methodologies or their points of view! Our roles in z-node are certainly not to visualize science or advertise its research, but offer different aesthetic, process-oriented and alternative perspectives. A good dose of life experience helps: the researchers in our program are all between the ages of 35 and 65, They mostly want to make a PhD about the interface between art and science, so that they can experiment with a unique blends of transdisciplinary theory and practice.

MC: In connection to this blend, what is a unique relationship between theory and practice in such a cultural environment?

JS: We encouraged many discussions about this relationship in our regular research meetings and decided that every student can find the relevant theories that best suit their own topic of study. We strive for diversity of opinion and so we teach artists to write academically about the surrounding context of their own work and leave a legacy for other art researchers to use as a reference in the future. Learning the art of debate in our research sessions helps develop new theories and find correlations to others, especially when the students all have to listen intensely to where another person is coming from. After each individual presentation we often have "questions-sessions" about the uncertainties and the complexities in the information that has been researched. We believe that "new knowledge" may be able to be found in cross-disciplinary challenges, particularly when learning is based on a physical experience inside scientific environments where one is exposed to different methodologies than ones own. For example, what might art and science processes actually have in common if they share the aim to raise public awareness about climate change?

MC: Can you give me some examples of who has graduated and what "new knowledge" they have produced in relation to Environmental science?

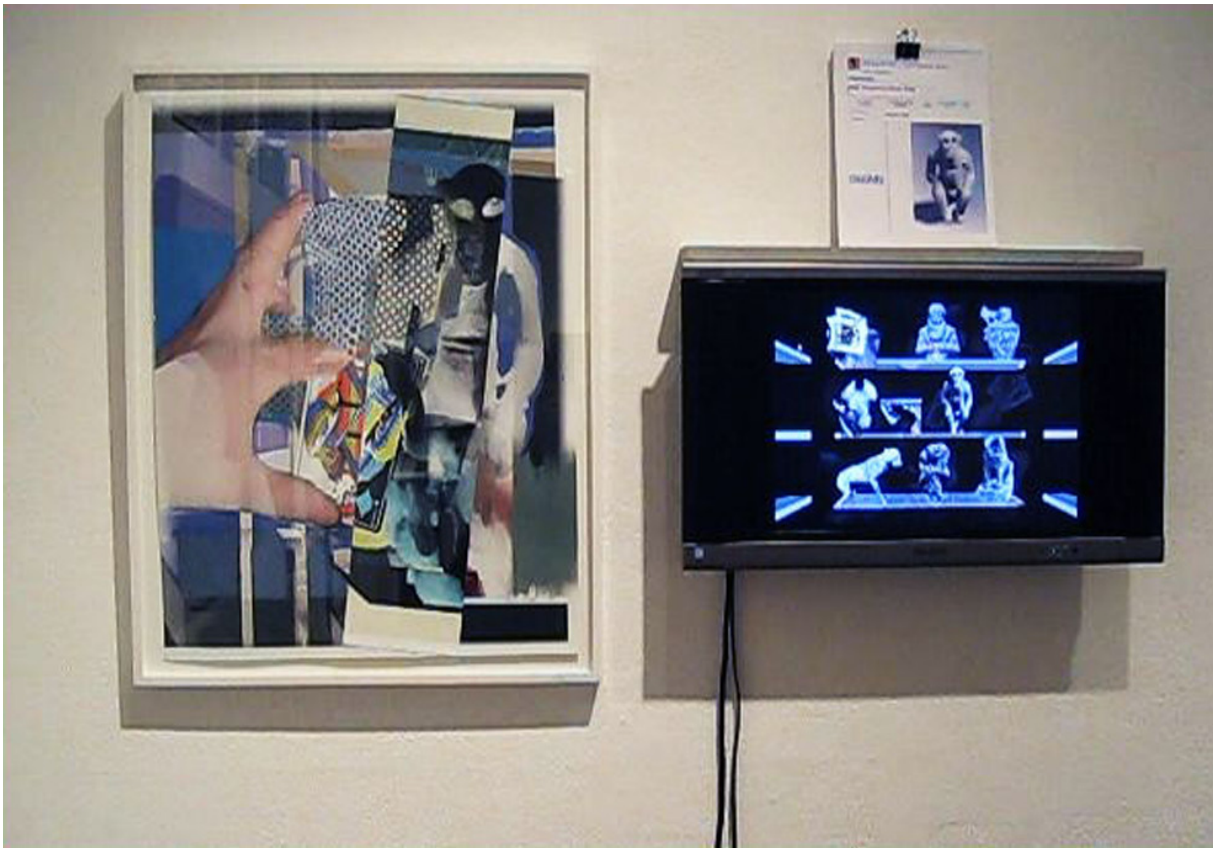
JS: Mmm, in relation to art and ecology, the most difficult challenges for this cluster of researchers is to create new theories about relativism. The sheer scale of the problems we face on the environmental level only make this challenge harder! A comparison of art and science methodologies will need to be featured in this research! For example Andrea Polli (See FIG 3) conducted research about air pollution and applied an interpretative method she called "geosonification" to increase public awareness about global weather and climate monitoring and computationally modelled data. This was related to her direct experiences of creating and presenting location-based media art in in places like Antarctica. So she conducted comparative interviews with leading environmental scientists and meteorologists about their methodologies, in order to compare her own approaches to weather and climate. Another Artist, **Tiffany Holmes** designed her own eco-visualization software to promote resource conservation. (see FIG 1) This software gave users daily visual feedback from site-based media art thus elevating others understanding of resource consumption patterns, Her aim was to compare attitudes toward environmental stewardship in the workplace and in the arts so as to increase peoples conservation behaviour.



(FIG 3) Andrea Polli: Media art and the Air: Sonic Antarctica (2008)

MC: What about "new knowledge" in the group where fine art is actually mixed with Neuropsychology or Sociology?

JS: There have been four graduates in this group and for them it has been interesting to take a critical look at how experiments in neuroscience and psychology are built and what methodologies are used to confirm their hypothesis or analyse behaviour in an objective manner. One might even ask: how can the subjective nature of the arts influence scientists to form different approaches? One of our researchers, **Ellen Levy** made an enormous taxonomy of all the artists who had addressed the subject of "attention" in their work and compared these with scientific methodologies like those found in the clinical testing of ADHD or attention deficit. By combining the perspectives of the neurobiological discourse about attention with analyses of artworks that exploit the constraints of the attentional system, she claimed that art offered a training ground for attention, including alerting, orientation, and executive control function. To this end she created her own art works in a gallery setting that questioned how norms of behaviour are defined and measured. (see FIG 4) In another research project by **Kirsten Johansen**, works of art were designed for astronauts on long-term space flights. With an aim to identify the aesthetic parameters for display of works of art on extended crewed missions, she developed novel working methods that could integrate the artist into the scientific process. By studying their psychology she began to create artworks that aimed to alleviate stress and help the astronauts with isolation and confinement. (see FIG 2) Because art in a space

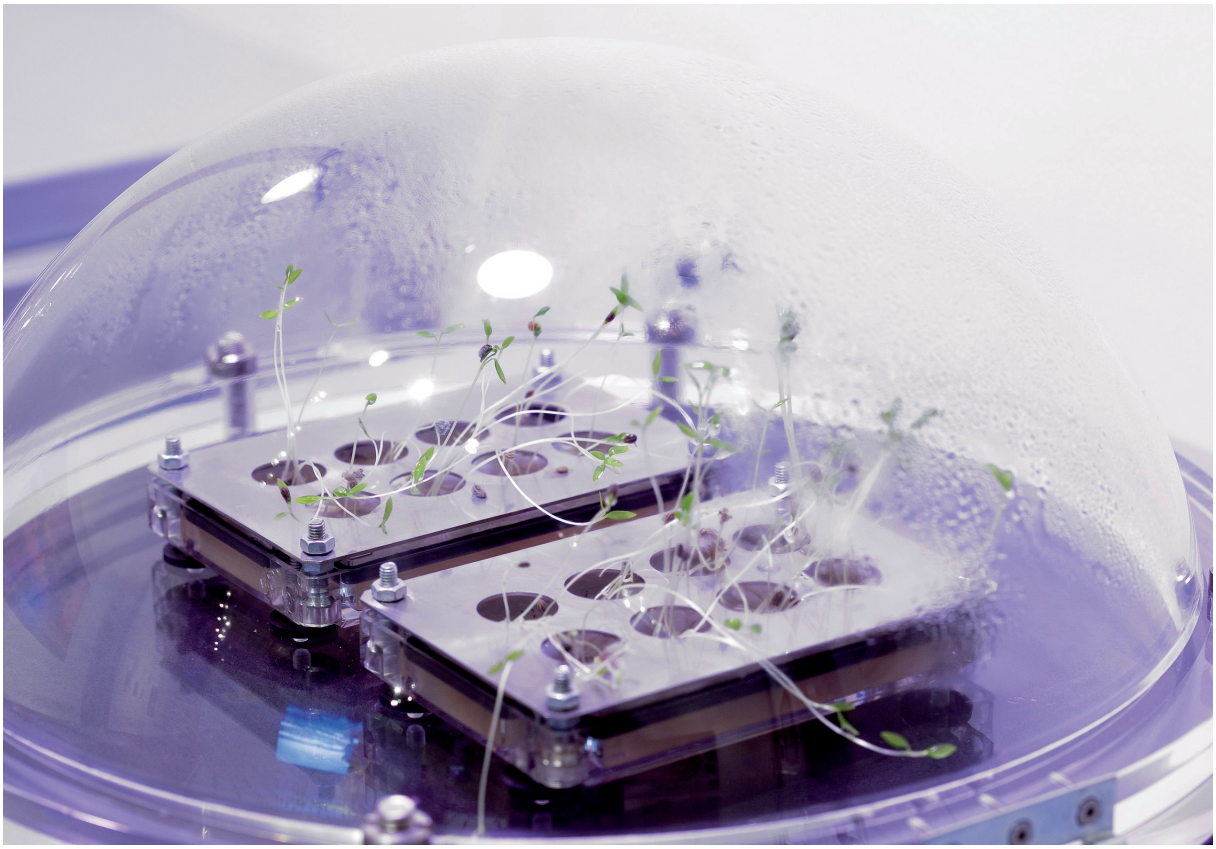


(FIG 4) Ellen Levy: Stealing Attention: art and neuroscience (2010)

capsule must follow the space agencies (ESA) demands of verifiability, safety, and reliability, and life sustaining behaviour she summarized these restraints for other artists in a manual.

MC: Well this brings up if social media can also help people connect in either isolated or networked environments. What about the other researchers in Z-node like Trebor Scholz and Juergen Moritz?

JS: **Jeurgen Moritz** scrutinized the level of intimacy that we have developed with smart objects particularly in our isolated homes because they urge us to rethink our capacity to act. Bruno Latour once framed the wider social role of technologies as res publica or 'public things' (Latour 2005) inferring that technological 'things' do not only mediate our existence, but are places where these mediations are made explicit. Moritz extends this discourse for the designers of technology through theoretical comparison from a trans-disciplinary point of view, claiming that it is time to rethink this relationship. But for **Trebor Scholz** the contribution to new knowledge lies in a critical analysis of the Internet and its relation to labour. He started out his research examining people's motivations for online collaboration, particularly in the fields of political media activism,

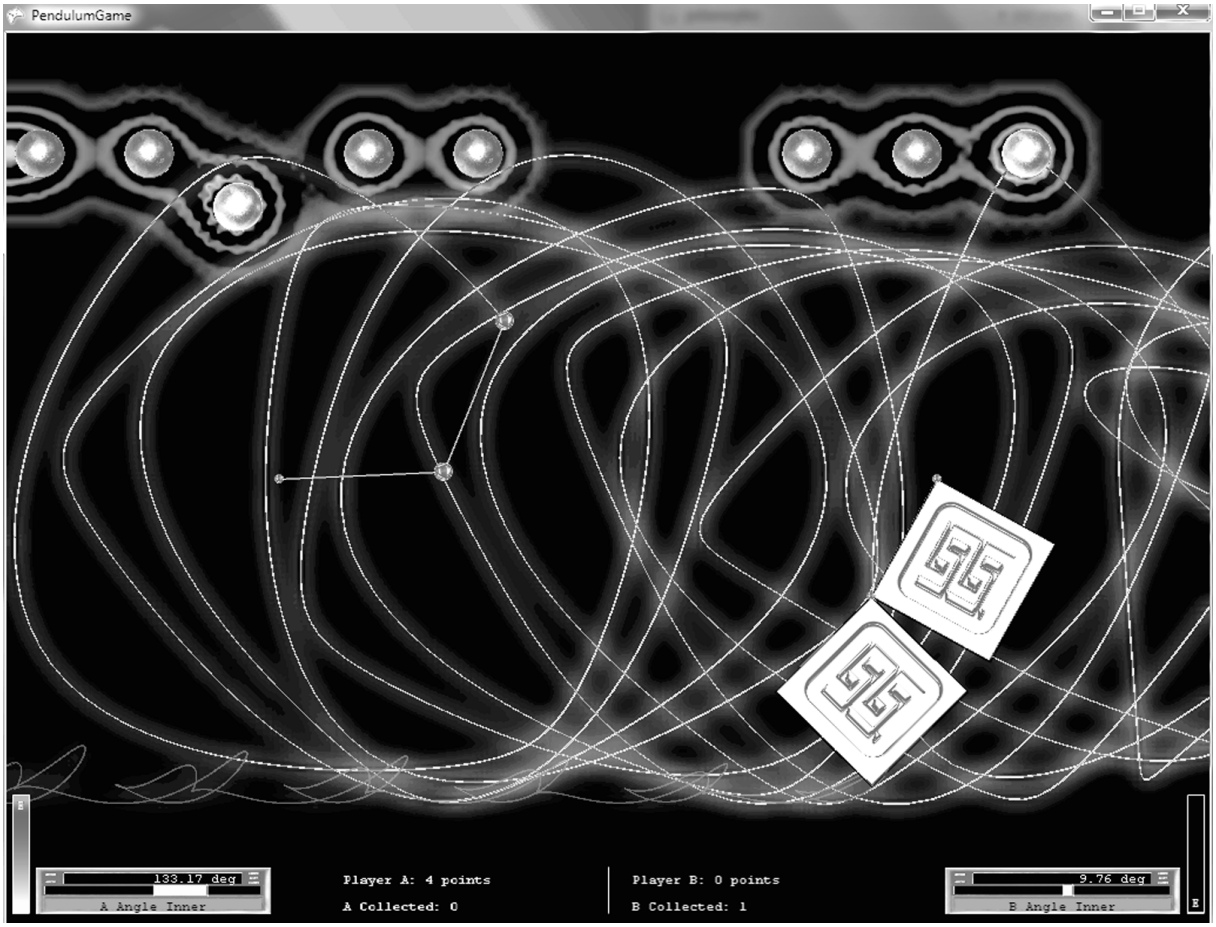


(FIG 5) Kirsten Johansen: art for astronauts on (ESA) space flights. (2010)

conference organization, networked cultural production and media education. This investigation led him to look at how cooperation-enhancing tools enable alternative economies and perhaps help us to rethink how offline civic participation also works. Recently, I saw a talk by him at the ZHdK where he outlined a set of strategies of resistance for social networkers, as well a list of alternative sites where people are trying to make a difference to how their private information is used or how their preferences are collected.

MC: I imagine that it gets hard to differentiate artists from designers in research practices such as these. Do you also have design researchers and if so what new knowledge is created here?

JS: Yes it is hard to differentiate the designers from the artists in our z-node group. The designers are perhaps more interested to explore the potentials of cross-modal interactivity and how current technologies could be expanded and humanized. But new knowledge will be found in the potential to combine the hard sciences with interaction design. For example: two of our graduates **Andreas Schiffler** and Karmen Franinovic have conducted research on the interface between design and hard sciences like physics




(FIG 6) Andreas Schiffler: game software for art and physics (2011)

and psychoacoustics. Andreas was actually a physicist earlier in his life, he turned to game design in 1995, and has since written many programs for media artists. He finished a dissertation called New Game Physics, an area of computer game design where physics is applied in interactive computer software (see FIG 6) In it he proved that trans-disciplinary approaches provide significant value, particularly between game developers, artists and physicists. He found novel ways to incorporate physics into games. The applicability and user impact of such new game physics across these target audiences was thoroughly examined. I think his study provided new material to address discrepancies in game theory and in digital media design.

**Karmen Franinovic** is a sound designer who works here at the ZHdK. Her research into Sonic Interaction Design (SEE FIG 7) featured psycho-acoustics where new findings about sensorimotor contingencies, could change the way in which we understand human interaction in everyday environments. In her dissertation she set up a

(FIG 7) Karmen Franinovik: Sonic Interaction Design and Psychoacoustics (2011)

foundation for a new realm of design that is focused on sound that engages sensorimotor experiences. This has been sadly neglected within the existing design practices. Her premise was that such a foundation can be best developed if it is grounded in trans-disciplinary methods that bring together scientific and design approaches. Her seminal workshops can provide other designers with a number of new collaborative methods and strategies and encourage connections between different disciplines. She also hopes that her results will be used, shared and extended by other design researchers.

MC: Who are the second supervisors for these students. Isn't it someone from the AI lab here in Zurich?

JS: Both of these students PhDs dissertations were second supervised by **Dr. Daniel Bisig**, whose background in Artificial Intelligence and sound, produced valuable feedback for their concepts. Also Dr. Rolf Pfeiffer from The Artificial Intelligence Lab was an external advisor for **Louis Philippe Demers**, a robotic designer who is pursuing theoretical research and artwork on robots as a form of "expressive media". He explored the theories of audience identification, performance and spectacle. I think he hopes that his research on the history of automata and machines will shed light on the reasons why we are fascinated by mechanical representations of performers. He suggests that a comparison between theatre and AI, might empower new theatrical design strategies.

MC: What about your current students what kind of research are they doing now?

JS: Well, we sill have 10 students to graduate. We still have our three themes but we are collaborating much more with science labs like the Institute for Intergrated Biology at the ETHZ or The


(FIG 8) Aviva Rahmani: Wetlands restoration, peformance art and GIS (2012)

(FIG 9) Brandon Ballengee: eco art, amphibian biology and "citizen science" (2008)

Mind Brain Institute at EPFL (Neuropsychology) in Lausanne. In the first case, Dr. Hilbeck works with students in our group like **Aviva Rahmani**, **Brandon Ballenge** or **Eugenio Tallessi** on environmental science. For example, **Aviva Rahmani** is a Conceptual artist working on Wetlands restoration and she integrates performance art and geographic information systems (GIS) in her artwork. (see FIG 8) Rahmani renovated a piece of coastal wetland: a former town dump, on a remote fishing island in the Gulf of Maine. Currently she is in the process of assessing the problems through scientific evidence and detailing her own design models to apply to other degraded environmental sites. Another New York artist, **Brandon Ballangee**, investigates if combinations of art and wetland biology can effectively increase public understanding of environmental phenomenon. His aims are to develop temporary laboratory and field-based research investigations, but he himself is actually generating scientific data. It's about the ratios of amphibian deformities and their potential problems in two continents, through collaboration with public and other participating biologists. He actually engages the public in "real" biology through "citizen science" workshops, fieldtrips, and gallery exhibits. (see FIG 9)

MC: Do you think that other art researchers see themselves as a kind of catalyst between science and the public?

JS: Yes but I think that each researcher has to personally decide about the type or definition of this translation. On the one hand, we have **Juanita Schläpfer Muller**, who is fascinated by visual communication and the challenges of ecological novelty from a trans disciplinary art and science practice-based perspective. She works with ritual art models and informal science learning for scientific experts

(FIG 10) Nicole Ottiger: bodily perception in VR and cognition (2011)

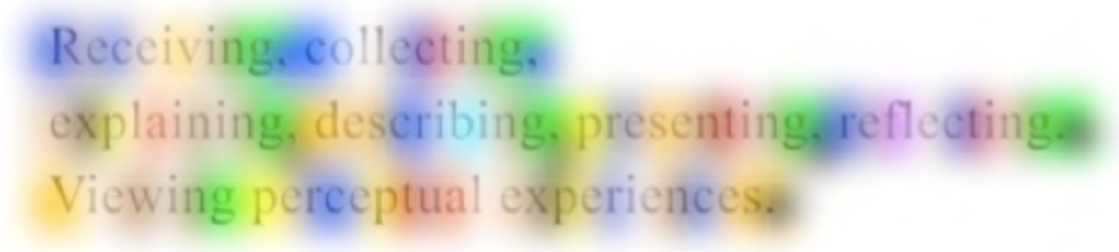
and non-experts and hopes that environmental awareness can translate into behavioural change about the use of resources. She is drawing on communication theory, sociology/cultural studies, art education theory, and cultural geography as well as climate science. On the other hand, Eugenio Tasselli is a designer and a computer scientist with a focus on localized observations and adaptation strategies. In his research project, a set of mobile phones are being deployed in different farming communities in which the threats posed by climate change are aggravated by poverty. He hopes to enable farmers to build a database of their knowledge and to communicate with other farmers, scientists and the general public using images, sounds and text. These case studies will provide the evidence and experience in order to determine in which ways these tools might empower farming communities. So you see these researches represent two different types of roles and for different audiences.

MC: Seems like these students are really mixing their own art methods with ones from sociology: don't you still have some researchers who are especially focused on methods from neuropsychology or psychology?

JS: Well I do think that art and neuropsychology are a very natural coupling because perception lies at the heart of both disciplines. So in this z-node group we have people like **Nicole Ottiger**, who is exploring the role of the body of the artist in the conception, execution and appreciation of art making and how our perception of art works is linked to the right and left hemisphere of the brain. Her advisor is from the Mind Brain Institute at EPFL. (See FIG 10) Another designer, **Sandra Hoffman** conducts research on Typographic Synaesthesia. She explores if the coupling of visual communication and neuropsychology could help designers address different approaches and perceptions about synaesthesia. In this light she focuses on three forms of visual perceptive phenomena: 1. Grapheme-colour, 2. Ticker tape and 3. Spatial sequence synaesthesia. ( See FIG 11) Each of these three types has either typographic stimuli or typographic sensorial experience and these can be classified by neuropsychologists. As far as I know both of these researchers are delving into relatively new fields of exploration between neuropsychology and the arts.

MC: What about cultural theories and sociology?

JS: Another art researcher **Teresa Chen** is interested in the social and psychological conditions of a similar displacement and the focus of her research is on women artists of (East) Asian descent located in a Euro-American context, who




(FIG 11) Sandra Hoffman: Typographic Synaesthesia and neuropsychology (2012)

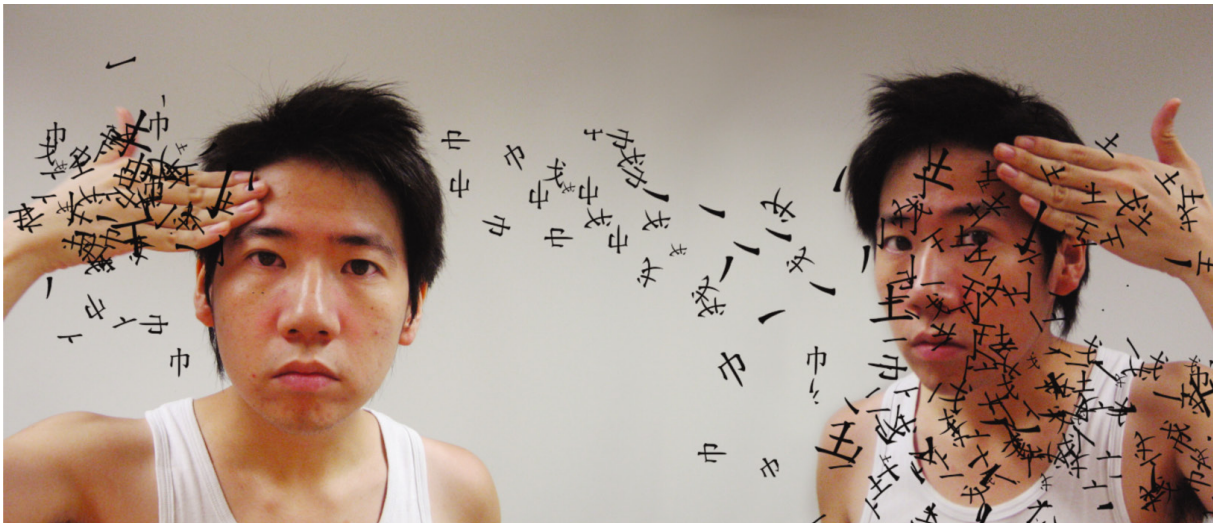
explored cultural differences in their work. Here she hopes to reveal alternative perspectives that challenge previous notions about cultural identity, especially with regards to origin and belonging. She cites that similar concerns and strategies are used by artists to address the influences of cultural connotations on "the self". In our group the viewpoint of studies like these are always based on the artists own practice. In a similar way Hung Keung directly focuses on the effect of transforming cultural theories about space and time from Ancient chinese history into his own digital interactive environments. He creates language based interactive platforms that study the effect this transformation will have society. (See FIG 12) He also identifies the future opportunities for cooperation with the business, cultural, social, educational, and public sectors. But like your own research on the territory of the airport, his is the territory of Hong Kong as a hub for travel to China.

MC: Actually my own focus is on architecture and the psychology of work and travel, so I guess also I fit into this category of sociology?

JS: Yes, You do fit here, especially because you are an architect who is focusing on the relationship between mobility, constant travellers and the workplace. By drawing theoretical elements from both digital art and architecture and you have already found many correlations between emerging socio-spatial transformations and new forms of mobility. I imagine that you will uncover how architecturally situated interaction design can establish these spaces as a socially responsive environments. I also think that in terms of mobile technologies and space there are some correlations to Trebors PhD on the Internet and Labour that I described earlier!

MC: I guess the trick for the supervisors is to see where the correlations do actually connect the research together? That is quite a variety of art research on ethical technical, social and neuropsychological levels!

JS: Well as supervisors we are not following those scientific research rules wherein the Professor determines the topics of each graduate student. This will not work in the arts! Unique individual approaches to research are too valuable. However, because we require a focus on the interface between art and the science, we do share a desire to identify the differences and similarities between



(FIG 12) Hung Keung. Space/Time/Dao, Chinese calligraphy and digital media (2010)

the researches. We also want to create unique sets of research methodologies that might apply to art practice. Also, we all think our research should encourage further collaboration between art and science contexts. This might not happen unless the research that artists conduct is academically rigorous enough to be taken more seriously in the science context!

MC: Interesting how you often talk about the importance of different academic contexts. What is the relation of z-node to the third cycle of education reforms in Europe?

JS: Actually the whole Plymouth Graduate program is an example of The Third Cycle, because we offer artists the opportunity to write about their practice and encourage that the students explore other thematic contexts than their own. Also because of our close connection to the Artist-in-Labs program, we require that our students reflect on their own know-how transfer experiences in scientific research. We encourage the students to search for funding potentials with other European research projects and offer supportive letters and references, for them to become partners with science institutions and universities as equal partners. For example we had a EU cooperation called: CLOSED and **Karmen Franinovik** was involved the project as part of her PhD. (http://closed.ircam.fr/)

MC: Don't you also collaborate with other schools that want to create similar programs?

JS: Yes right from the beginning of z-node, we had a visiting scholars program and each year another institute invited us to come and give seminars or mini-conferences in these locations. We just returned from New Mexico University (who also hosted ISEA - The International Symposia on Electronic Art) before that we were at Monash University in Melbourne, Nan Young University in Singapore and Concordia University in Montreal,


(FIG 13) The Z-node Group, Concordia University in Montreal (2007)

(See FIG 13-Montreal photo) to name just a few. It seems that all of these universities invited us to discuss the potentials of PhD Programs in the arts, so I think that they used our visit as a way to raise internal interest in collaboration and debate. There is a growing international interest about the nature of research in the arts and we aim to help identify an international standard. We are currently working on a conference about art, science and research in conjunction with Warsaw and Copenhagen to be held next year.

MC: You suggested earlier that most of your students want to leave some kind of legacy for other art researcher to draw upon. Where can those others read and explore Z-node research?

JS: Actually all the printed final dissertations from Z-node are available in the ZHdK Library for on-campus loans. But there is also in e-thesis from each one available at the University of Plymouth. (http://pearl.plymouth.ac.uk/handle/10026.1/272) Beside these lodgings of their dissertations, the Z-node researchers are already publishing in many related publications and journals. We think that co-publishing might help this debate. So one of our current book series called Transdiscourse is with Monash University. Transdiscourse is a book series based in our z-node group – a contract with Springer/Vienna/ New York. We are planning to also have an exhibition of this Z-node research in the ZHdK Diploma show in May 2013.

**Information**

ALL copies of the Z-node final Dissertations can be found in the ZHDK Library. Also the Transdiscourse Book

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