

Maria Blondeel

An Artistic Sonic Mobile Mapping System

I approach the mobile mapping¹ technique from within my artistic practice. I investigate how an autonomous image can be translated into sound and the other way around. How does this affect our perception? How do we perceive such phenomena?

I use data sonifications. The intensity and the wavelength of light is captured with optical sensors and transposed into pitch. Lots of light results in higher frequencies, less light produces lower pitches. This basic concept was the starting point for my sound generation.

In my mapping-vehicle projects I make sound recordings of the itinerary with interactive light sensors that modulate the pitch of sound generators. The travelled distance, the traffic situation and the speed of the vehicle determine the length of the recorded tracks. During daytime I generate sonifications of the light of the sun in rural areas and at night with the artificial light of the road illumination and the urban and public lighting.

So it is not the case that the landscape and city views inspire me to produce a graphic score, like composers have often been inspired by visual stimuli. I am not interested in a pure musical development. I do not consider myself a composer in the classical sense of the word.

For my artistic mapping-vehicles I do not use the typical panoramic camera, like those used for applications like e.g. *Google Street View*². My recording vehicle is equipped with omni directional sensors, light sensitive sensors, or, to be more accurate, photoelectric resistors. I connect those sensors to electronic oscillators. More recently I have been using image sensors, such as CMOS-chips of digital video cameras. And I have been using a computer with a visual programming language like MAX/MSP/Jitter.

My earliest mapping-vehicle dates back to 2001. The work *A10/E40*³ is a recording of the motorway between Ghent and Bruges. In this work one hears a

continuous low frequency, rhythmically interrupted by tone pulses caused by the typical Belgian electric light standards that illuminate the motorways at night. Since then I have used different sonification systems in mapping-vehicles.

I developed my most recent mapping-vehicle sonification system for *A40*^(c) and *Freeway*^(d). These recordings form the basic material for the artistic research project *Extended Optical Flow*^(d) of Noël De Buck at the School of Arts, KASK in Ghent, Belgium. The optical flow is what the brain perceives via the retina when the beholder and the surroundings move in relationship to each other. Within this research I develop a preliminary draft for a scale model of a new work of art. The draft describes a membrane on which retina and eardrum imaginarily coincide in such a way that transmissions occur on the separation of our sensorial perceptions.

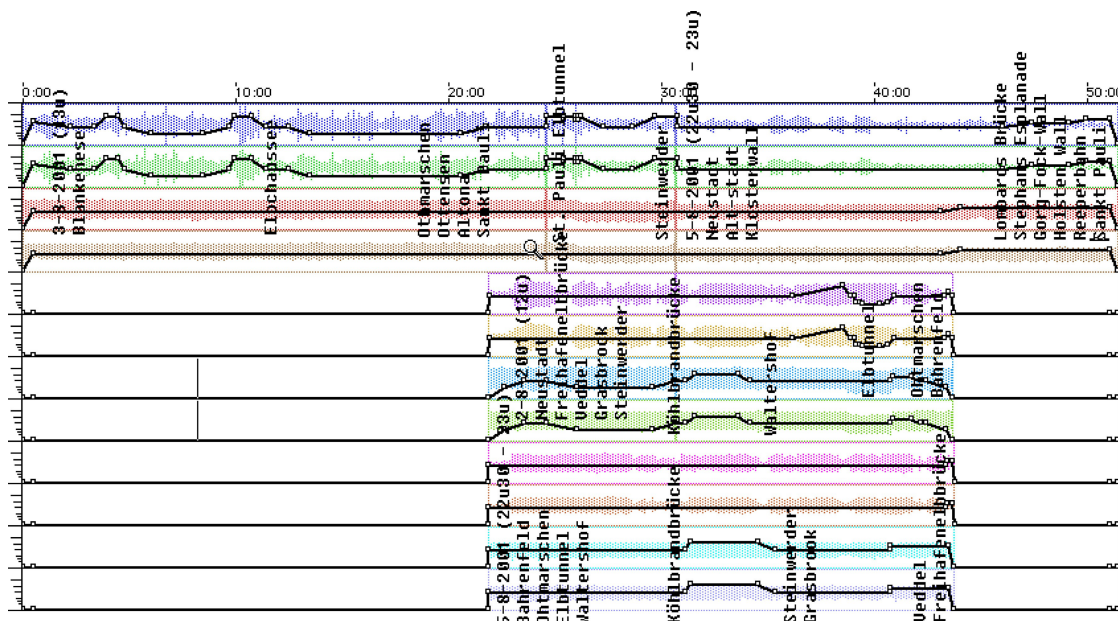
The recorded video and audio materials are being exhibited in spatial installations or presented as performances. Some works have also been published as audio-cd or video-dvd.

Excerpt: *A10/E40*

First generation mobile mapping projects with sensors

HH Hamburg 2001

“Maria Blondeel somehow has folded the map, creating a complex counterpoint, having us listen simultaneously to the sounds of different places, at different times, moving in opposite directions, moving in different directions, but always moving, gathering a multiplicity of information in a hyper-sensory lecture of the city.”⁴ (Guy De Bièvre)



Maria Blondeel, *HH Licht Ton* (2001) Score, ProTools edit window with Street names

In 2001 I resided, invited for a work residency by the city of Hamburg, in Altona, the old part of town, in Spritzenhaus, a centre for acoustic art founded and curated by Heinz Weber. During the summer I worked on a series of recordings for the sound installation *HH*. The audio-cd *HH Licht Ton*^(a1) is a sound map of the light in the city of Hamburg. I explored the city at various times, both diurnal and nocturnal and traced three routes with the assistance of a Sony route planner and an ADAC city map.

The mapping-vehicle was a Citroen Berlingo. Six sensors, photoelectrical resistors, were attached to the wind shield, the side and rear windows inside of the vehicle.

The sensors were connected to square wave generators. These are simple analogue sound generators, using a resistor (R) and capacitor (C), forming an RC loop determining the periodicity of the cycle. The six sensors are tuned in two groups (left, right) with a mutual difference in frequency in such a way that the interference between two simultaneous tones generates beats. In this process only the intensity of the light has an effect. 2-channel recordings were made. In *HH* one not only hears a translation of the light, but also an additional sound recording made with two directional mi-

crophones. Heinz Weber, the sound engineer of the project conceived a solution to reduce the wind bursts on the microphones during the ride to an acceptable level, by positioning them backward through the opened rear windows.

These recordings, due to the recognizable street sounds, add a “visualizing” element to the electronic sounds. The routes were, depending on the traffic situation recorded as continuous takes. During the nocturnal recordings one hears a continuous low frequency due to the limited street illumination in Germany. One hears tones swelling and fading caused by the headlights of passing cars. Twelve takes were selected. The schematic representation of the routes was more or less reconstructed in the ProTools edit window, in which I have set the volume literally following the level variations of bridges and roads. One hears the Köhlbrandbrücke both with the noontime sun and the full moon at night.

Excerpt: *HH*

In the studio the twelve tracks were subjected to a spatial arrangement.

The installation *HH* was exhibited in Brussels in 2003 during the *Earwitness*^(a2) series, a sound art series curated by Guy De Bièvre. The presentation is a 2-channel one, with the sounds distributed between a left and right position. For the exhibition I used two loudspeakers also positioned left and right in the room, projecting the sound literally upward in the space.

Second generation mobile mapping projects with sensors and single channel video

R20 Brussels 2004

“This sound makes the objects, which would otherwise take centre stage in one’s perception, give way to the shifting quality of the light itself. Sound and light move along parallel lines, reinforcing one another. Even though the objects themselves are always recognizable, they become ever more abstract.”⁵ (René Van Peer)

Looking at evolving light circumstances converted into sound during a sonic ride.

R20 Brussels [inner]^(b1) was a sound performance with a mini-van taking place during the *Argos Festival* in Brussels in 2004. The audience would board with the van at dusk for a ride of about 45 minutes on the small city ring. The ring is a sequence of tunnels about 8 km long built in 1958 for *Expo58*, the Brussels

Maria Blondeel, *R20 Brussels [inner]* (2005). Mapping vehicle, windshield set-up of camera and sensors (Photo: Johan Vandermaelen)



World’s Fair. It is located above what once, in the 15th-century, was the city wall. In the van one would listen with wireless headphones to the wavelengths of the light, both daylight and artificial light, sonified as modulated square waves.

R20 Brussels [inner] (*Ring Roads in Belgium*)^(b2) was recorded at sunset, between 6 p.m. and 6:45 p.m., on November 28, 2004. I know the inner city ring of Brussels by heart as a roller coaster; a map was not required. With a fixed lens – a CMOS sensor connected to a digital video camera – the sky and the street lights were filmed. The tones were generated by six electronic sound generators. Left and right, two sensors were applied to the wind shield, the side and rear windows inside the van. The generators were tuned to 466 Hz, 659 Hz and 2093 Hz at full sunlight (approx. 100,000 lux). I based the tuning on the resonance theories of scientists from the beginning of the 20th century like Nikola Tesla. This theory states that all matter can be expressed as vibration figures.

During the performance in the van and in its representation in the autonomous video and sound installation the vibrations of the light are simultaneously perceived by the eye as well as by the ear. The question is whether our brain experiences the sound frequencies as resonances of the light (the image) or the other way around. I drove counter clockwise with the setting sun in the back, which produced a reflection of the van’s interior and the traffic in the rear onto the wind shield.

The pitch of the sound goes down with the diminishing light of the setting sun. The downward motion of the pitch is interrupted by the long fluorescent lighting in the tunnels. After leaving the last tunnel the sun has completely set and the lampposts along the road become the main factor of the work.

Third generation mobile mapping projects with multi channel video sensors

A40 Ruhr 2010

“This is an ambiguous and ambivalent process of generative transmutations that opens up a performance of an unseen scene of image and

sound beyond the mental event. 'A40 RUHR' empathizes on a mix of empiric, mental and associative means within the 'geographical' navigation. It is like an intensified presence, which has been involved in plural dynamics of physical and intellectual excitement: on the one hand: 'the subjective ride' and 'the mental trip', on the other hand: the awareness of an attempt to synthesize dynamic perception. Simultaneously dealing with conflicting empiric and conceptual time and space parameters, the act of dis-covering the (non)-places will make them 'visible' in expansive scenery. The slide of the 'reality'-tracks with their semi-abstract icons will rush in our perception and embodied memory to corrupt the simultaneous constructions of several artistic layers. They provoke physical and mental shifts towards the concept and the traces that are involved in the meaning, the possibilities and the limitations of this always-renewing technology with its impact on the relation, on the drafts and concepts of art to let them de-rail systematically on an associative way."⁶ (Noël De Buck, 2010)

A40 was recorded in August 2009 on the A40 motorway where it crosses the Ruhr area in Germany. The duration of the composition is based upon the travelled distance from Moers to Dortmund. It is almost an hour driving. This duration became the canvas onto which to assemble the structure of the composition, consisting of eleven tracks lasting between 4 and 8 minutes each, all together just under an hour. The eleven tracks of *A40 RUHR*^(c4) are chronological sequences and evolve from daylight to artificial light (at night). They can be presented integral, but also played back separately or in a random order.

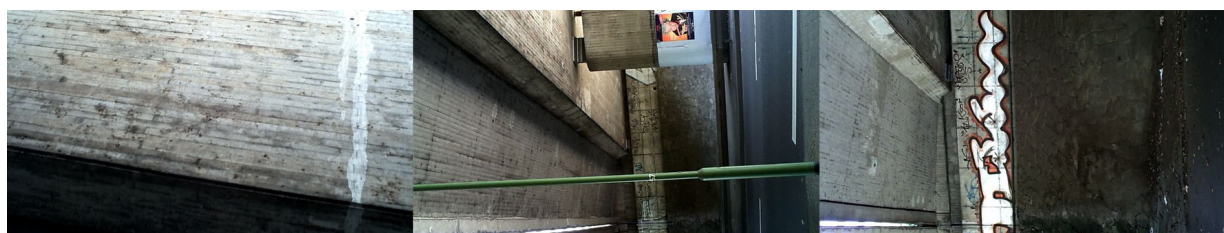


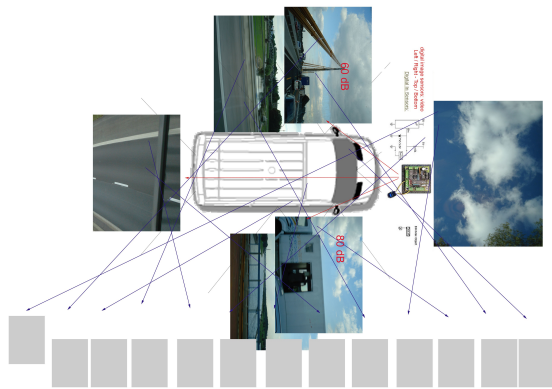
Maria Blondeel, *A40 RUHR* (2010). 2-channel video installation, 2 shop windows (198cm x 400cm), 2 HD video projectors, Medienwerk-nrw, 'Fenstergalerie' Onomato Künstlerverein, Düsseldorf, Germany 2010. (Photo: Baltus)

A40 RUHR is a spatial installation with three video beamers and a 6-channel sound installation. The installation was presented on a panoramic white wall of 297 cm by 1350 cm with surround sound during *Klinkende Stad*^(c2) in Kortrijk. The work has also been presented in non-conventional spaces, e.g. a shop window in a street in Düsseldorf for *Medienwerk-nrw*^(c1) and in a mobile cinema bus on the ring road around Oldenburg for *Edith-Russ-Haus*^(c3). A version has been published as a dvd, for which all eleven tracks were mixed as an autonomous composition in Dolby Surround 5.1 / Dolby Stereo sound.

The trajectories on and around the A 40 were prepared with the map collection *Atlas der Industriekultur Ruhrgebiet* and the *Städteatlas Ruhrgebiet*. For the navigation in the Ruhr area itself a GPS (*TomTom Europe*) was used. An important detail of *A40* is that the itinerary was filmed non-linear: on the cloverleaf structures of the interchanges of *Kreuz Kaiserberg* and *DO-West* all four-leaves were completely followed. The recordings were made using three mini Aiptek camer-

Maria Blondeel, *A40 RUHR INSTALLATION* (2010). Image aggregation (composition) with 3-channel video (ratio 16:3)





Maria Blondeel, *A40* (2010). Scheme for mapping vehicle with 2, 3 or 4 image sensors

as mounted inside a Mercedes Sprinter van onto the front, left and right windows. The fixed CMOS image sensors had a 5 mega-pixels definition. The resolution is 720p: 1280 × 720 square pixels at 30 frames per second (NTSC) in progressive scanning. The lateral cameras were tilted 90° because the fast motion of passing surroundings could not be recorded without deformation in the horizontal image lines. In the installation it is the up and downward traffic stream that is determining for the orientation of the image, landscape or portrait. However realistic and recognizable the traffic situations are in this video work, they do not necessarily represent something. They form the intermediate link between the light and the sound.

In this digital work I use for the first time a computer with a visual programming language for the sonification. An algorithm determines the translation of light into sound. The basic concept is that the harmonization of the sounds has an equivalent in the colour blending of the light. I extract the pitch calculation from the HD 720p recordings based upon the digital video-technical construction of the image. I use the 256-colour dept structure for determining the pitch. I assign a frequency range to each of the video RGB (Red, Green, Blue) colour channels. I do not implement a pure harmonic tuning. Each digitally recorded frame of the 30 frames per second is being translated into three frequency figures. The blending of the colours thus generates clusters and chords. From each frame I translate 0.9 mega-pixels into a frequency number in such a way that I can generate triads that will combine to a shape

for the musical ear. Millions of light colours are being translated into millions of audible microtonal frequencies. Musically sequences of tonal and atonal intervals are being produced.

“Thus the beholder, within this almost aggressive new punk emanation of what originally is a new-agey subject, comes to new, unexpected sensory perceptions.”⁷ (Marc Ruyters, 2010)

Excerpt: *A 40 RUHR INSTALLATION*

Freeway Europa 2011

“The transposition of the humming of the original ‘geographical’ navigation from time into space slides into our embodied memory to become a remodulated time-space ‘diagram’ of this ambivalent road trip.”⁸ (Noël De Buck, 2011)

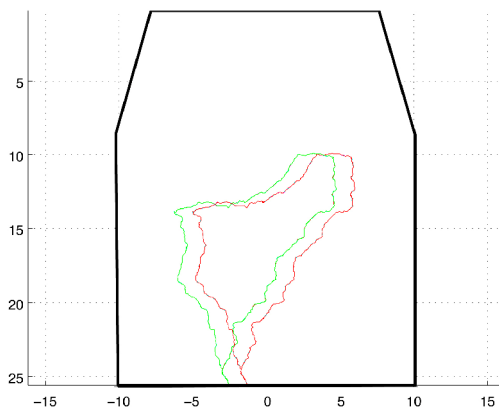
The recordings for *Freeway* were made on a commission of *TONSPUR 45*^(d2), curated by Georg Weckwerth in Vienna, which also organizes sound installation projects a.o. in Berlin and Prague. In this work I approach different aspects of international traffic in Europe. The contemporary highways, asphalt and concrete, implanted in an arranged and controlled landscape of ecological roadside verges constructed as noise barriers of earth, often landscaped or deadening walls of sound running all along, the cars, the trucks and finally the journeys. I exclusively made use of GPS navigation. The composition is a sonification of the route Ghent, Berlin, Prague, Vienna, Ghent: 2656 kilometres. It was recorded from city to city as two long tracking shots on MPEG-4 digital video. Almost 30 hours were shot while driving in a mapping-vehicle equipped with two fixed video sensors (left and right), at a speed varying between 50 and 150 km/h.

The digital video images have again been sonified with MAX/MSP/Jitter. The composition consists of four parts, from city to city, based upon the duration of each complete journey. The source duration was relatively accelerated in such a way that each part only

lasts 24 minutes. *Freewaystück*^(d) is an 8-channel composition and was presented in Vienna in *KLANGHIMMEL MQ*^(d1), a sound architecture by Andres Bosshard. In this version the amplitude of each sound track was determined by the amount of “sky” in the video image, using colour tracking.

Excerpt: *Freewaystück*

The composition was also presented for *TONSPUR 45* in Berlin on an 8-channel sound installation designed by Peter Szely. This was spread over the length of a walkway between Berliner Dom and the Hochschule für Musik Hanns Eisler (nearby the Humboldt-Box) at the Schlossplatz. The composition is thus assembled that it allows the external sound layer of the surroundings to blend in. The sounds resonate over the square, just like the motorway noise infiltrates the landscape.



Maria Blondeel, *Freeway, Acceleration* (2012). Composition for WellenFeld H 104, TU Berlin, Berlin, Germany

In 2012 I was invited by Volker Straebel to conduct my artistic research at the department for Audio Communication of the Technical University of Berlin, thereby using their Wave Field Synthesis system of three-dimensional sound reproduction. For the *WellenFeld H104* I extracted a new sonification with a different sonorous density from the video recordings.

For the practical research I developed with sound engineer Henrik von Coler an experiment with moving and accelerating both static and moving sound sources. We let the computers generate a choreogra-

phy based upon the geographical coordinates from Googlemap data of my video journeys.

2704 loudspeakers powered with a computer cluster of 832 sound channels draw in the space the itinerary Ghent, Berlin, Prague, Vienna, Ghent as 8 jagged double sound lines. *Freeway, Acceleration*^(d3) is a spatial play with the velocity of the recording vehicle and the speed of the video frame frequency.

Translation from Dutch: Guy De Bièvre

Editing: Noël De Buck

Works⁹

(a) **HH**, Maria Blondeel 2001

The research for *HH* was made possible by the centre for acoustic art Spritzenhaus in Hamburg (G). The realization was supported by the city of Hamburg and the Flemish authorities. Maria Blondeel was artist in residence in Spritzenhaus during July and August 2001.

(a1) **HH Licht Ton**

Audio-cd published by Maria Blondeel and Spritzenhaus 2001. Recorded by Maria Blondeel with the assistance of Heinz Weber, Spritzenhaus 2001. Mastering: Heinz Weber, Equipment: Citroën Berlingo, 6 sensors, 6 square wave generators, 2 directional microphones, DAT-recorder, Digital Audio Tape.

Excerpt:

<http://soundcloud.com/maria-blondeel/hh-licht-ton>

(a2) **Street WORK: HH**

2-channel sound installation. Equipment: Stereo loudspeakers, equalizer, cd-player, audio-cd, duration 51:30, loop. Earwitness, CCNOA, Center for Contemporary Non-Objective Art, Brussels, Belgium 2003 Curator Guy De Bièvre.

(b) **R20**, Maria Blondeel 2004

The research for the performance was made possible by Argos during the Argos Festival 2004 that took place in Brussels (B).

(b1) R20 Brussels [inner]

6-channel sound performance in a mobile vehicle. Equipment: Mini-bus, 6 sensors, 6 square wave generators, 6 wireless headphones. This Place is Dreaming/Rethinking and Transfiguring the Sites and Sounds of Brussels. ARGOSFESTIVAL 2004, Brussels, Belgium 2004. Curator Ive Stevenheydens.

(b2) R20 Brussels [inner] (Ring Roads in Belgium)

Evolving light circumstances converted into sound during a sonic ride. Dvd published by Maria Blondeel. (SD) dvd, 1 Title, 4:3, Landscape, duration 48:00, colour, Dolby Stereo. Recorded by Maria Blondeel and Johan Vandermaelen 2004. Equipment: Citroën Berlingo, 6 sensors, 6 square wave generators, 1 CMOS camera lens, DAT-recorder, Digital Audio Tape, mini-dv.

Excerpt: <http://vimeo.com/mariablondeel>

(c) A40, Maria Blondeel 2010

The research for A 40 Ruhr was made possible by School of Arts, KASK, Ghent (B). The realization of A40 RUHR was supported by VAF, Flanders Audiovisual Fund (B) and Happy New Festival of Flanders Kortrijk (B). Maria Blondeel has been designated official guest of North-Rhine Westphalia in the scope of the state grant awarded in cooperation with the City of Düsseldorf and Medienwerk.nrw (G). Maria Blondeel resided in Düsseldorf from March until mid-May 2010. Recorded by Maria Blondeel in cooperation with Noël De Buck, 2009. Equipment: Mercedes Sprinter, 3 digital video camera's, HD disk, MacbookPro, MAX/MSP-Jitter.

(c1) A40 RUHR

2-channel video and 6-channel sound installation. Equipment: 2 shop windows 198cm × 400cm, 2 HD video projectors, 6 loudspeakers. Medienwerk-nrw, "Fenstergalerie" Onomato Künstlerverein, Düsseldorf, Germany 2010. Curator Michael Voets.

Excerpt: <http://vimeo.com/mariablondeel>

(c2) A40 RUHR INSTALLATION

3-channel video and 6-channel sound installation (ratio 16:3). Equipment: white wall 297cm × 1350cm, 3 vi-

deo projectors and 6 loudspeakers. Klinkende Stad: The Finest in Flemish Sound Art. Happy New Festival van Vlaanderen, Kortrijk, Belgium 2010. Curator Joost Fonteyne.

Excerpt: <http://vimeo.com/mariablondeel>

(c3) RUHReMIX

3 to 6-channel, live video and sound performance during bus drive. Equipment: Built-in dvd and sound system, 2 dvd's, 2 cameras, colour & light interactive computer software, sound card, stereo loudspeakers, Flatscreens Klangpol, MUSIC II (2) "Interaktivität mit Wolken und Schafen – ein Ausflug" Edith-Russ-Haus für Medienkunst, Oldenburg, Germany, 29 May 2010. Curator Jens Brand.

(c4) A 40 RUHR / 2010

Noël De Buck (ed.) Julius M., Voets M. (2010) A40 RUHR. Dvd. Ghent: Atelierhuis Maria Blondeel. Dvd, cover with poster by Maria Blondeel. (SD) dvd, 11 titles, 16:9, duration 57:00, colour, Dolby Surround 5.1 / Dolby Stereo. Mix and digital master: Denis Rosen, Onomato Künstlerverein

- | | | |
|-----|-------|-----------------|
| 1. | 06:00 | Interchange I |
| 2. | 04:51 | Interchange II |
| 3. | 04:01 | Freeway |
| 4. | 05:00 | Interchange III |
| 5. | 04:12 | A43 |
| 6. | 04:40 | AIR |
| 7. | 07:46 | DO-West |
| 8. | 05:00 | Interchange IV |
| 9. | 04:47 | Crepuscule |
| 10. | 05:00 | Half-light |
| 11. | 04:59 | Half-dark |

(d) Freeway, Maria Blondeel 2011

The research for the recordings in 2011 was made possible by TONSPUR, für einem öffentlichen Raum (A) and School of Arts, KASK, Ghent (B). The artistic research with Wave Field Synthesis (WFS) system WellenFeld H 104 was made possible by Volker Straebel, Elektronisches Studio Fachgebiet Audiokommunikation, TU Berlin (G), SmartBE (B), OTC/OCMW Ghent (B), School of Arts KASK Ghent (B). Maria

Blondeel resided in Berlin from mid July until October 2012. Extended Optical Flow is an artistic research project by Noël De Buck for School of Arts, KASK in Ghent (B). Recorded by Maria Blondeel in cooperation with Noël De Buck, 2011. Equipment: Mercedes Sprinter, 2 digital video camera's, HD disk, MacbookPro, MAX/MSP/Jitter.

(d1) **Freewaystück**

8-channel sound work, duration 24:00. KLANGHIMMEL MQ, MuseumsQuartier WIEN, TONSPUR, Vienna, Austria 2011. Extensive sound installation in the main courtyard of the MQ Vienna in the context of 10 years MQ. A project by TONSPUR für einen öffentlichen raum in cooperation with quartier21/MQ, Zurich University of the Arts und University for Applied Arts Vienna. A sound architecture by Andres Bosshard under artistic direction of Georg Weckwerth.

(d2) **Freewaystück**

8-channel sound work, duration 24:00. TONSPUR 45, TONSPUR, für einem öffentlichen Raum, Schlossplatz, Berlin, Germany 2011. Sound works at Schloßplatz in Berlin. A project by Georg Weckwerth and Peter Szely.

Excerpt:

<http://soundcloud.com/maria-blondeel/freewaystueck>

(d3) **Freeway, Acceleration**

8-channel sound work with video, duration 24:00. Composition for WellenFeld H 104, TU Berlin, Berlin, Germany 2012.

Endnotes

1. Mobile mapping is the process of collecting geospatial data from a mobile vehicle typically fitted with panoramic cameras for 360° views or any number of remote sensing systems. These images are mapped into a 3D model.
2. Google Street View is a technology featured in Google Maps and Google Earth that provides panoramic views from positions along many streets in the world. It was launched on May 25, 2007, in several cities in the United States, and has since expanded to include cities and rural areas worldwide.

3. *A10/E40* (2001) Multiple, box with audio-cd, published by Kunsthalle Lophem, Center for Contemporary Art, Loppem, Belgium 2001.
4. Guy De Bièvre, *Earwitness CCNOA*, Center for Contemporary Non-Objective Art, Brussels, Belgium, 2003.
5. René van Peer, "Zu Maria Blondeel. Eine Grundbedingung", in: Georg Weckwerth, Helga de la Motte-Haber, Matthias Osterwold (eds.), *sonambiente berlin 2006. klang kunst sound art [catalogue]*, Heidelberg: Kehrer, 2006.
6. Noël De Buck in: Maria Blondeel, *A40 RUHR*. DVD, with texts by N. De Buck, Michael Voets, Maija Julius, Ghent: Atelierhuis, 2010.
7. Marc Ruyters, *A40 RUHR. <H>ART #70*: Edegem, Belgium, 2010.
8. Noël De Buck, *Freewaystück*, Introduction for the opening of TONSPUR 45 at Schloßareal Berlin. Berlin: TONSPUR für einen öffentlichen raum, 2011. See also: http://berlin.tonspur.at/b_45.html (accessed: 2/26/2013).
9. All links to video and audio examples were last accessed 3/3/2013.

Abstract

In this article the author describes her artistic involvement in a research project charting the optical flow in the brain when both the beholder and his or her surroundings are relatively in motion. The result of this kind of artistic research cannot scientifically fully be verbalized. But it manifests itself in the produced art works and throughout their process. It is a research about generating sound and colour with an anteriorly unpredictable result. Among others it is conducted with interactive applications and algorithms, data-sonification and visualization without a functional image-sound-content coupling. The relative shifts and translations from image to sound and from sound to image intend to work out the multiple and complex complementary artistic layers in moving, active and interactive image and sound. Using three generations of mobile mapping projects a survey is sketched of the different video and sound installations. For each of those a specific artistic sonic mapping system was developed. From the period between 2001 and today four projects have been selected: *HH*, *R20*, *A40* and *Freeway*. Ranging from the earliest recordings with photoresistors (LDR, Light Dependent Resistors) and square wave generators to the recent works, using image sensors (CMOS, Complementary Metal-Oxide-Semiconductor) of digital video cameras and Visual Programming Language.

Author

Maria Blondeel is a visual artist and her studio is located in Sint Amandsberg, Belgium. She is a photographer, but is better known for her sound art works. She is involved in an artistic and scientific research project at the School of Arts, KASK, in Ghent. In 1986 Maria Blondeel started an idiosyncratic collection of "blueprints". Under the impetus of the intermedia scene in New York she began experimenting with light sensitive chemicals, electronic sound generators, stereography and stereophony. Her artistic practice situates itself in the domains of intermedia, installation and sound art. She worked with composers a.o. Mary Jane Leach, Jerry Hunt, Guy De Bièvre, Michael Vorfeld and Sam Ashley. Together with the American intermedia artist Phill Niblock she founded the Gent based Experimental Intermedia non-profit (1993–2003). With it she organized various intermedia exhibitions. In 1998 she made *Wachtsoniek* (commissioned by the Flemish au-

thorities, VAC Hasselt, Belgium). This is a permanent interactive sound installation for telephone with 208 computer-controlled fluorescent lights in the facade windows of the atrium of the office building. For her sound and video project *A40 RUHR* she was awarded official guest of North-Rhine Westphalia in the scope of the state grant awarded in cooperation with the City of Düsseldorf and Medienwerk-NRW 2010. In 2012 she was invited by Volker Straebel to conduct her research project with the Wave Field Synthesis System of the Audio Communication department of the Technical University in Berlin.

Title

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