

# in a thousand drops... refracted glances

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## ABSTRACT

In this paper, we describe an interactive audiovisual installation *In a thousand drops... refracted glances*. The work creates a dynamic cinematic environment encompassing multiple screens and audio channels that work to present fragments of the bodies of humans in hybrid relations to them, thereby creating a sense of the fragility of experience. A motion sensing system tracks and maps participants' movement flows and locations onto a set of generative video animations and musical processes.

## Keywords

Fragmented bodies, identity, multiplicity, distributed image, media diffusion, interaction, chaosmos.

## 1. in a thousand drops... refracted glances

### 1.1 Concept

By choosing the human body as the center of attention this work points to the way we judge and gain a sense of both others and ourselves. The dynamic and interactive nature of the work becomes a symbolic actuality (simulation) of the dynamic nature of how we both construct and discover our identities. The work reveals a background made of deeper perennial questions: Who am I? What is my community? Where do its boundaries exist and how permeable might they be?

The driving inspiration for this work is an idea that we are all part of one body, one ecology and one planet. We therefore create an image of a human body that reflects the notion of the whole humanity as one organism. If we conceive ourselves as a part of one larger organism we can no longer live in separation.

This work is created in Vancouver, British Columbia, which is characterized by its diverse social fabric. Here people from the variety of world cultures come together and share the same living environment. While the core idea of the work is that we are all one, in parallel this new organism points to the notion that we are also multiple. Each one of us is composed of many influences, memories, and histories swimming in this river of rich and diverse world cultures. Every day we are working with and interacting with people from everywhere in the world and this installation reflect this multiplicity that we live in today.

*in a thousand drops... refracted glances* is an audiovisual environment that constructs and deconstructs bodies through processes of stitching, repetition, collage, stretching, contraction, multiplication and reduction. As a result of these processes new hybrid fugal bodies are born that speak to the variety and complexity of the ecological and interpersonal balances that depend on the mutual interdependencies of the community of agents that make up its population.



Figure 1. in a thousand drops... refracted glances installation

The work continuously and dynamically shifts its focus providing opportunities for the participant to engage in a spectrum of modes of attention, from lateral to narrowly focus. Interactions with the work take the form of refracted glances both rewarding and confounding in an ongoing process of making sense of a chaosmos — the balance between confusion and order — the fantastic and the logical — dreamt and waking realities.

### 1.2 Cubist image

As the Cubists expressed in their work that our world is made of a series of slices of reality—temporal and spatial—in this work we see this process put into a dynamic and interactive environment. Cubism poses and solves the problem of the structure of the image by building a representational volume, but in no way does it treat the objectively understood third dimension. It accepts geometrization and recomposition of shapes achieved by the movement of eye position. Cubism leaves objects in space in a static position while the observer is given freedom of movement so that these objects are viewed from all sides; in the natural world it is impossible to view an object from different perspectives simultaneously. While the Cubists juxtaposed a series of slices of multiple perspectives of reality representing the element of time on the two-dimensional plane, in this work we construct a dynamic composition through a series of slices extracted from multiple bodies. The resulting image bears relationship to the process explored by cubists in their formalizations of the image of multiple perspectives pulled together within the artistic composition. The cubist image is one of multiple perspectives and spaces acting as a temporal collage that creates image depth. Our work is constructed from multiple bodies, ethnicities and perspectives into a unified body that at the same time represents the unity within cultural multiplicity and diversity within one self.

### 1.3 Audio-visual Interface

A camera-based motion tracking system is used to determine the location and direction participants' movement. A set of layered generative music processes is guided in their production by the data inferred by the motion tracking system. As the same motion tracking information is also used to guide the visual animations, as a result the audible and visible images have a strong synchronization. The participants, in this way, become collaborators with the unfolding audio-visual experience.

This work draws from a large database of images, generative sounds and animations to create dynamic unified composition distributed across 110 unique screens and 8-channel audio. We photographed 100 subjects and their various body parts, faces, eyes, lips, hand, etc. The various media components are braided together based on participant movement to articulate the overall artistic image. The idea of braided processes [2, 3] is taken up as the central compositional strategy—weaving and intertwining a variety of threads at several levels of the work: audible threads, independent yet correlated in space; visible threads juxtaposed in space and time—sequenced and layered.

The motion tracking techniques used include blob-detection to determine individual locations for tracking in relation to the space of the installation. Optical flow sensing determines the direction of the participant's as a group. With this basic information tendencies are inferred with target state such as speed, acceleration, stasis. These are mapped onto the musical parameters such as orchestration, phrase selection and detail. The musical aspects of the work are contained as two main sets or ensembles of generative processes. The first ensemble of processes constructs phrases or gestures for a virtual ensemble of prepared piano (sampled instrument) and bowed strings (violins and cello), based on the reconstructive phrase modeling technique. The interaction guides derived from the motion tracking system are used to select both the phrase style and internal details of the phrase construction.

The second ensemble is composed of synthetic timbres drawn from the harmonic series and function much as a choral contrast to the instrumental simulations of the 1st ensemble. Interactive hooks to this ensemble guide selection of harmonic complexity and stochastic characteristics such as glissando speed and direction.

The overall effect of the interactive experience is one of a kind of spatially dynamic orchestration in which a particular musical process-gesture is mapped to either a specific location or a movement style such as motion along the slow-fast spectrum, the near-far spectrum, and stillness. Given the dynamic character of the multi-screen animation and the flexibility of the musical production the work succeeds in moving in the direction of a new form of process-based cinematic experience [1] in which the processes guiding the audible and visible images are braided together into a new form of multiply-mediated heterophony.

### 1.4 Experience design

The experience of *in a thousand drops... refracted glances* is an audio/visual sculpture in fragmented space and time that becomes a single audiovisual image as one interacts with the space of the exhibition. The sense of embodiment creates an interrelationship between the visible images, our movement and the harmonically rich sonic environment. The interactive aspects of the work provide points of focus for flows of both audible and visible images.

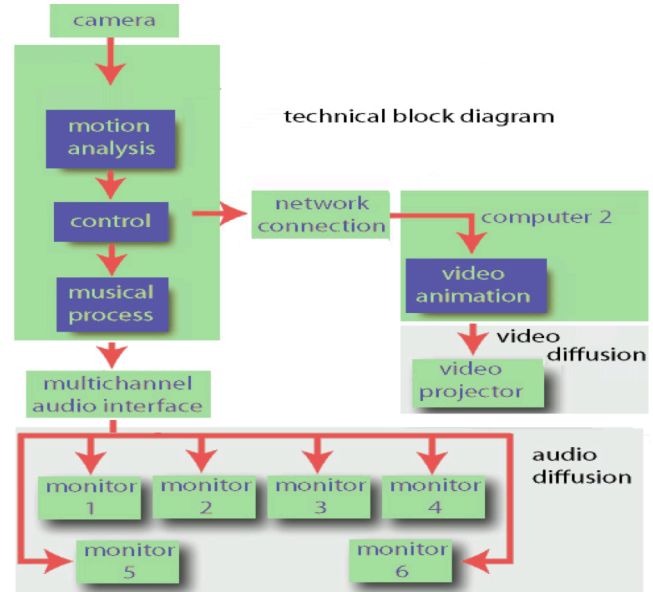


Figure 2. Block diagram of the installation

The work is structured so that if there are less than five participants the tracking system looks for their movement and position tendencies which prompt the animation and sound algorithms to direct their activities towards the movement center. As participants move around the work a subtle effect is exerted on how the images are animated. Characters composed of multiples emerge and are accompanied by synchronized emergent musical gestures produced by the engagement of the participant. The interaction encourages a collaborative relationship with the work as it mediates between participant's presence in a simple but engaging negotiation of action-reaction. If there are more than five participants the animation and sound enter an automatic animation mode where the images and sounds are directed and spread evenly across the installation space. Our aim is to achieve subtler forms of interaction that give a sense to the audiences that are they are in the right place at the right time.

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