Echology

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1. INTRODUCTION
The playful, graceful motions of Beluga whales swimming in water create a mesmerizing motion space to watch. These highly communicative creatures use a variety of vocalization, physical expressions and physical contact in their navigation, social interaction and survival. Beluga whales have fatty structures on the top of their heads; it is hypothesized that these structures, called melons, act as acoustical lenses for focusing and directing sounds for echolocation. We have created an installation for participants to play with directional sounds initiated by the playful movement of beluga whales in the water.

2. DESCRIPTION
We have produced an interactive multimedia installation piece for the Open Media Environment (aka Atrium) at the University of British Columbia. The installation uses Jitter to process a live webcam feed of the Beluga tank at the Vancouver Aquarium [1]. The motion of Beluga whales in the webcam view trigger various whale-based sounds to enter the soundscape of the installation. In the soundscape, the sounds are spatialized to swirl around the participants at the edge of the atrium space. An interaction table in the centre of the space has 8 buttons representing 8 reflection points, or speakers, on the soundscape's perimeter. As a sound passes each point, the direction of the reflection point indicates where the sound will go next. Each button press changes the direction of a reflection point so that participants can play with sounds, directing, moving and even stopping the sounds within the soundscape. The beluga webcam image is projected above the participants and is displayed on a monitor embedded in the interaction table. The embedded monitor also depicts a computer graphic visualization of the sound movement and reflection direction around the soundscape. Participants and the audience can also see sound movement by way of lights arranged in a circle on the speaker truss overhead. These lights illuminate as sounds pass to visualize the path of sounds.

The installation consists of an interaction table, 8 surround speakers, a PC and a G5 Mac both running Max/MSP/Jitter, 8 lights and a light controller, a live webcam at the Vancouver Aquarium, and the atrium projection space. The interaction table has 8 large buttons representing the reflection points on the edge of the soundscape (i.e., the speakers on the truss). The table also houses a monitor to allow participants to see the Beluga whales and the visualization of sound movements.

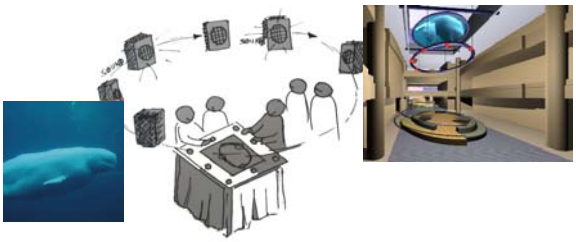

Figure 1. Beluga webcam, sketch of interaction environment, projection and lights in atrium.

3. EXPERIENCE
The experience allows participants to play with the spatialized sounds initiated by Beluga whale motion in the webcam view. They may attempt to control the sound, or allow it to dance around their heads. This use of redirected sound is inspired by the melon of the Beluga. We intentionally make the interaction simple, along the lines of Toshio Iwai's *Sound on the Table* [1] so that participants only need focus on the spatial aspects of the sound rather than tonal qualities. We feel that this provides more engagement for participants; the imagery of Beluga whales swimming blends with the sound spatialization and visualization to make a rich, playful mediascape. The whales' play results in movement patterns that are fairly repeatable, but unpredictable and organic. The audience member (or participant) can listen and watch the mediascape on the overhead speaker truss and video projection. However, the "sweet-spot" is at the interaction table located in the centre of the raised platform of the atrium.

Acknowledgements:

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4. REFERENCES
[1] http://www.vanaqua.org/belugacam/

[1] Iwai, Toshio. Composition on the table. In *ACM SIGGRAPH '99 Electronic art and animation catalog*, Los Angeles, California, United States, 1999, 10