

# Mocean

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## ABSTRACT

Mocean is an immersive environment that creates sensory relationships between natural media, particularly exploring the potential of water as an emotive interface.

## Keywords

New interface, water, pipe organ, natural media, PIC microcontroller, wind instrument, human computer interface.

## 1. INTRODUCTION

The human body is mostly water. We live in water for the first nine months of our lives. Being close to water, to play with it, is an innate desire. Mocean frames a time and a space to explore our lost memory in a literal way.

As an interactive installation, Mocean invites members of the audience to touch, stir and play with water in a clear tank. The movement of water is translated into movement of air in an array of antique organ pipes suspended above the water. The sound of the organ pipes envelops the person stirring the water: movement echoed in the water's waves and ripples.

## 2. DESCRIPTION

Mocean uses approximately 40 organ pipes connected to blowers via a sculptural tubing structure. Each blower activates a module pipes. The installation's dimensions can be adapted to different spaces. A water tank is positioned at torso level, and the organ pipes hang from the tubing, speaking near ear level. Video cameras placed below the tank send images to a computer, which analyzes the movement of the water and sends commands to a custom microcontroller board. The microcontroller then turns the blowers on and off. The air from the blowers is routed through clear tubing to the organ pipes.

The spatial arrangement of the pipes is a function of the physical dimensions of the tank; the sensation of moving sound around by moving water in particular ways is created by the pipe placement. As the interaction with the water develops, the user gains an intuition about the spatial and tonal arrangement of the pipes and the natural rhythms of the

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system--Mocean becomes a musical instrument.

## 3. EVOLUTION OF MOCEAN

The Mocean project began in 2003 as an exploration of organic interfaces. The idea was to use a natural medium, water, to produce electronic sound and control video. Later, the video was replaced with the projection of the water itself. The piece's acoustic nature and the connections among wind, water, and movement, led the organ pipes' use for the sound element.

The approach taken was inspired by the 1868 Henry Erben tracker pipe organ, and located in St. Patrick's Old Cathedral in New York City, where Jared Lamenzo is Organist. Before the advent of gas/steam/water-powered bellows, young men were paid to turn or pump the bellows. Some of the most interesting and beautiful sounds are created when stops are not fully open or closed. Based on compositional sketches done on the Erben, a collection of 19<sup>th</sup>-century organ pipes was started.

Using the variable pressure produced by a series of digitally controlled blowers, it was possible to capture different sorts of frequency/amplitude envelopes from the pipes: sounds that matched the water interface. The additional harmonics produced in the different modules create an environment in which the wind is sensed.

## 4. EXPERIENCE

The user is able to engage Mocean in a variety of ways. One can brush or skim the water, dip one's arms in deeply, sprinkle water about—each person has a way to play it. Continued exploration is rewarded; as the blowers become activated more often, the sound of the pipes becomes louder and of longer duration. The water continues moving after one stops playing Mocean, making a connection between the water and the air motion. Different portions of the tank activate different modules of pipes. The experience's duration is up to the user.

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