Camera for the Invisible

Jay Silver
MIT's Media Lab
77 Massachusetts Ave. E15-020a
Cambridge, MA 02139 USA
silver@media.mit.edu

Abstract
I built a camera for exploring and experimenting with the urban environment. The camera doesn’t sense light, but rather things that the eye can’t see like CO2, temperature, wind, etc. I plan to try out this “camera for the invisible” with urban-explorers-to-be, guided by Duckworth’s Piagetian-derived Critical Exploration methodology.

Keywords
toolkit, experiment, explore, critical exploration, camera, Native, awareness, Nature, constructionist

ACM Classification Keywords
B.4.2 Input/Output Devices
Data terminals and printers

Introduction
Natives don’t teach Nature awareness – they experience it. So it makes sense that Nature educators like Tom Brown Jr (aka “The Tracker”) [1] and Joseph Cornell [2] lead learners experientially through the rural wilderness. However, more than half of the world’s population now lives in an urban landscape. The air we breathe, the noises we hear, and indeed everything our urbanite senses come into contact with are influenced by the “nature” of our urban landscape. In “Last Child in the Woods” Louv shows how thoughtful exposure to Nature plays a huge role in almost any measure of a youngster’s wellbeing: decreases depression, obesity, and attention deficit disorder – yet increases standardized test scores, grade-point averages, skills in problem solving, critical thinking, decision making, and creativity and creative leadership [4]. If we are to continue to live in cities, we should start to become aware of urban Nature...

So the problem is dual:
1) How can we facilitate people recognizing urban nature?
2) How can we facilitate non-experts exploring and experimenting with urban nature?

The idea is that by recognizing and getting a feel for the landscape, people may also develop respect for the landscape resulting in care, stewardship, and convivial action.

A Toolkit for Urban Exploration
A toolkit for exploring Nature will inherently look less like an electronics toolkit and more like a collection of
magnifying glasses or stethoscopes. In this way, a toolkit for urban exploration focuses people's awareness on Nature.

**Camera for the Invisible**

Like a regular camera, the camera for the invisible has lenses, film, and viewfinders, but they do not function as we would normally expect.

**Lenses**

There are a collection of lenses for taking "pictures" of:

- wind
- temperature
- carbon dioxide (C02)
- electrical conductance
- sound (loudness)

Each of these "lenses" is actually a sensor, but it looks and feels like a lens, which snaps onto the camera body in the front.

**ViewFinders**

Just like lenses can be switched out on the front of the camera, the viewfinders can be switched on the back. This allows the sensed phenomena to be represented in many ways including non-visual:

- sound
- vibration
- color
- wind

**Synesthetic Learning**

So by mixing and matching the lenses and the viewfinders, one can start to listen to temperature or feel CO2. This allows people to learn in a way that matches their style, and gives a path to "re-see" what was originally out of the scope of awareness.

**Film and Time-Lapse**

The camera also comes with "film" in the form of memory, which allows explorers to record and play back measurements over time. For example, someone could take a walk through the park and see how the wind varies throughout the walk. Then the measurements from the walk could be redisplayed at high speed like a time-lapse movie to try to find patterns that weren't obvious in the short term. Imagine another scenario: recording the loudness at a busy intersection for 24 hours, then watching (or listening or feeling) it in time-lapse mode to discover some patterns.

**Evaluation**

I plan to use the Critical Exploration [3] methodology to co-explore the environment with children. Then we will create stories about what we found to share with others. I'll be looking for behaviors that indicate exploring like touching and feeling and listening and waiting. I'll be looking for behaviors of experimenting like "I wonder what would happen if _______." I'll also be looking for how people communicate their discoveries to others through narrative and possibly take action based on what they found.