

Measuring Device

Sensing as a critical and creative act



122. Presented as a device for measuring the hypothetical “Despondency Index” of a given locale, Natalie Jeremijenko and Kate Rich’s *Suicide Box* (1996) nevertheless records very real data regarding suicide jumpers from the Golden Gate Bridge.

Readings

Benjamin H. Bratton and Natalie Jeremijenko, *Suspicious Images, Latent Interfaces* (New York: Architectural League of New York, 2008).

Catherine D’Ignazio and Lauren F. Klein, “On Rational, Scientific, Objective Viewpoints from Mythical, Imaginary, Impossible Standpoints,” in *Data Feminism* (Cambridge, MA: MIT Press, 2020).

Jennifer Gabrys, “How to Connect Sensors” and “How to Devise Instruments,” in *How to Do Things with Sensors* (Minneapolis: University of Minnesota Press, 2019), 29–71.

Natalie Jeremijenko, “A Futureproofed Power Meter,” *Whole Earth*, Summer 2001.

Mimi Onuoha, “When Proof Is Not Enough,” *FiveThirtyEight* (blog), ABC News Internet Ventures, July 1, 2020.

James C. Scott, *Seeing like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1998).

Brief

Create a machine that asks a question of the world. Your machine should either measure something interesting, measure something in an interesting way, or create an interesting provocation by bringing an uncommon measurement to our attention. The focus here is on the selection and collection of intriguing data (using a microcontroller and a sensor), rather than on the production of an attractive interpretation or visualization. What overlooked dynamics or invisible rhythms can you discover?

Your project's location is critically important: the situation of your device will affect who encounters it, how it is perceived, and the meanings it evokes. It's up to you whether your device measures human activity or the activity of something else in the environment (cars, animals, lights, doors, etc.) Consider if you are measuring ambient, incidental, or deliberate activity, and whether or not your device is passive or actively used. Be sure to make a video documenting your measurement device at the data collection point. Although you may use any sensor you like, remember that even a humble switch is a sensor—and that some switches, like tilt-switches, can measure inadvertent movements in the world. Likewise, having a proximity sensor doesn't mean you have to measure proximity. Instead, you might measure the amount of time that something is proximal to the sensor (recording seconds, not centimeters). Or perhaps you might count the number of times that something has come close to the sensor.

Sometimes, student electronics projects can look suspicious. If you install your device in a public place, be

sure to secure necessary permissions (such as from your campus safety officer), and attach a small sign to your device with appropriate information.

Learning Objectives

- Review and critique methods for collecting data
- Experiment with social, performative, and sculptural modes of data presentation
- Assemble and install sensor hardware

Variations

- Restrict data collection to a specific site, such as the classroom or a nearby park.
- Provide students with a screen or other display, such as a multi-digit 7-segment LED, so they can represent their sensor readings at the site of data collection—creating the potential for public interaction and additional poignance.

Making It Meaningful

Census historian James C. Scott points out that measurement is a political act. Artists like Natalie Jeremijenko collect measurements in order to prompt evidence-driven discussion; others, like Mimi Onuoha, point out that what is *not* measured is equally revealing of a



128. *Library of Missing Datasets* (2016) by Mimi Onuoha is a systematized archive of hypothetical datasets. These data voids stand as potent reminders of what a society chooses to ignore or overlook.

Additional Projects

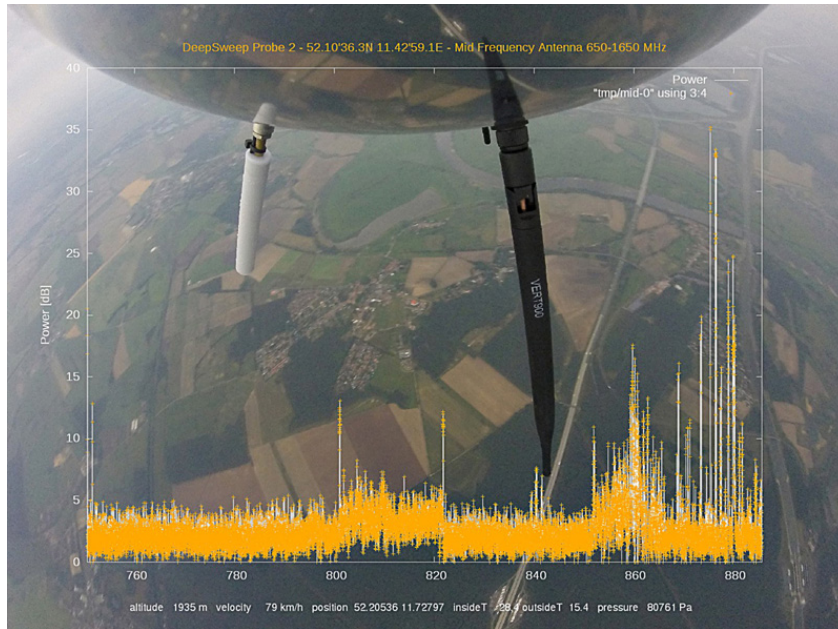
Timo Arnall, *Immaterials: Ghost in the Field*, 2009, RFID probe, long-exposure photography, and animation.
Timo Arnall, Jørn Knutsen, and Einar Sneve Martinussen, *Immaterials: Light Painting WiFi*, 2011, WiFi network sensor, LED lights, and long-exposure photography.
Tega Brain, *What the Frog's Nose Tells the Frog's Brain*, 2012, custom fragrance, electronics, and home energy

culture's biases and indifferences (the study of which is called *agnotology*). In the weird world of quantum physics, the term “observer effect” refers to the idea that the very act of measurement changes the subject being measured. Measurement, or the collection of data, alters the world and the way we see it.

Data collection has become a key practice across many fields. “Citizen science” is an educational and political movement that enlists everyday people in scientific activities and often focuses on monitoring local environmental conditions through distributed DIY sensing. For example, in the aftermath of the Fukushima disaster, radiation sensors were distributed to a concerned public, who transmitted readings to a central server.

Scholars Catherine D’Ignazio and Lauren Klein outline ways to responsibly work with data, taking philosophical ideas from feminist thought and applying them to data collection and visualization practices. The principles of feminist data visualization include acknowledging that data represents an incomplete perspective; emphasizing the context and the situation in which data was collected; and providing a way for those represented in the data to respond to it.

There is often something absurd, poignant, or whimsically futile about the act of measurement—an attempt to reduce an infinitely complex experience to a handful of numbers. In the arts, measurement can explicitly remind us that our understanding of reality is only ever an approximation.



123. *The Deep Sweep* (2015) by the Critical Engineering Working Group is an aerospace probe that scans the otherwise out-of-reach signal space between land and stratosphere.



125. Michelle Ma's *Revolving Games* (2013), another student project, measures the speed of a revolving door with an accelerometer, then displays the high score on an LED. Ma's game encourages risk-taking in an otherwise quotidian setting.



126. Catherine D'Ignazio's *Babbling Brook* (2014) is a red networked flower sculpture containing water quality sensors. The flower is installed outdoors in a creek or stream and audibly reports its data in the form of bad jokes to anyone listening.



124. Maddy Varner's *This or That* (2013), a “DIY voting poster,” is a student project made from paper-mounted electronics. A passerby taps sticky notes to vote between two options (e.g., “cats” versus “dogs”) proposed by other strangers.