




# Data Storytelling Studio

## *data sculptures*

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This sketch is about physically representing your data. The goal is that you'll work with some data to find and tell a story using those techniques. This sketch is three class sessions over a week and a half. The first is this lecture; the second is in class group work time, and the third is project presentations.

Supplies:

- Craft materials for a [Data Sculpture](#)

# Agenda

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- [15] Data sculpture activity
- [20] Inspirations
- [10] Readings
- [20] Physical viz review activity
- [5] Tools and techniques
- [15] Datasets and team-forming

# Data Sculptures

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Represent the data with **physical** variables

*Physicalizations? physical data? data sculptures? Dataphys? Data experiences?*

Lots of names, but I like "data sculptures" as the easiest to say.

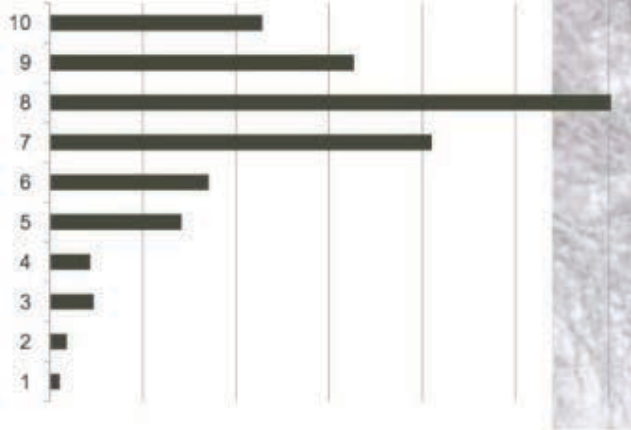
Read our [Data Sculptures paper](#) from the Data Physicalization workshop at DIS2017 for more details.

# make a Data Sculpture

25 mins

## VISUAL//

The following is a plot of responses to the question, "how happy are you right now," showing how responses were distributed



Extracted from the Somerville Wellbeing Report ([bit.ly/happy-villens](http://bit.ly/happy-villens))

This is some sample data for folks to look at and build a data sculpture.

## An Old Idea

"Quipus were complex assemblies of knotted ropes that were used in South America as a data storage device and played an important role in the Inca administration. Only a handful of specialists could use and decipher them. Their meaning mostly remains a mystery but it seems that color, relative position of knots, knot types and rope length were used to encode categorical and quantitative variables."

<http://dataphys.org/list/peruvian-quipus/>

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[Inca Quipus](#)

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The idea of representing data in physical form is old!

# Inspirational "Flat" Objects



Rahul Bhargava, 2014



Air Transformed, [Stephanie Paterson](#) & [Miriam Quirk](#), 2015



Elizabeth Peabody, 1856



Black Cloud, WWF & Ogilvy, 2007



Crossing Boundaries - Urbano Project

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Here are some inspirational "flat" objects:

- In 2014 I wanted to talk to the public attending a food festival about access to food and hunger ("food security"). I knew they wouldn't be predisposed to talk about it, so I used a laser-cutter to etch the data into vegetables. This created enough curiosity and interest that people came over and gave me a few minutes to get them engaged on the topic.
- Posavec mapped particulate matter pollution onto custom filters on glasses. She took something invisible (the air pollution) and created the glasses to literally obscure your vision. Each layer on the glasses was for a different pollutant. The density of etching mapped onto the number of icons on that layer.
- The Black Cloud we've talked about before.
- In Crossing Boundaries, an artists worked with youth to visualize data about access to public transit. The video showcases some of the projects they created from an artistic point of view.
- Elizabeth Peabody's quilts we already discussed as an alternate inspiration.

# Inspirational Interactive Objects



*Drip By Tweet, Domestic Data Streamers, 2014*



*iBINS Team, India, 2015*

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You can also make interactive objects in 3d:

- The Domestic Data Streamers makes high-production-value interactives. This one let people vote online for their favorite piece in an art show. Each piece was represented by a test tube on this sculpture. Each vote dropped one drip of fluid from the mechanism into the test tube for that vote.
- A group of undergrads I worked with at a [Civic Innovation Hackathon in India](#)



# Physical Mappings

Yvonne Jansen, Kasper Hornbæk. [A Psychophysical Investigation of Size as a Physical Variable](#). IEEE Transactions on Visualization and Computer Graphics, Institute of Electrical and Electronics Engineers, 2016, 22 (1), pp.479 - 488.

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- What physical encodings did they review?
- What is the least accurate? The most?
- How does this impact your choices of encoding physical variables?

# Physical Viz Review Activity

*to understand the design space*

- form a team of 3
  - scan [dataphys.org/list](https://dataphys.org/list) and pick a post-2000 project
  - prepare a 2-minute overview telling us:
    - what data are they showing?
    - what is the mapping from data to physical artifact?
    - Why does the physicality of it matter?
    - Do you like it or not?
- 
- you have 10 mins

# Tools

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- cardboard
- string
- glue
- etc.
- laser cutter
- 3d printer
- Arduino
- Makey-Makey

*contact me early if you want help!*

This is about making things in 3d. Use whatever you feel comfortable building with!

# Data Sets

*pick one, or use your own*

Hubway Rides

NYC Trees

CO<sub>2</sub> emissions

[Air Quality in Beijing](#) from US State  
Dept

[Global Temp Rise](#) from IPCC-  
approved models

...or something else

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I've provided some clean datasets students can use (see the syllabus for details). They can use something else, but it should be clean (so they don't waste time cleaning it).

# Team Forming

*find new people to work with*

What do you know?

What do you want to make?

What dataset are you interested in?

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Have everyone stand up and think about these three questions. Then have everyone pick someone else in the room to talk to. Give them 2 minutes to discuss. Then have them switch to someone else and do the same. Repeat for 3 rounds and then tell everyone to form groups of ~3.

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