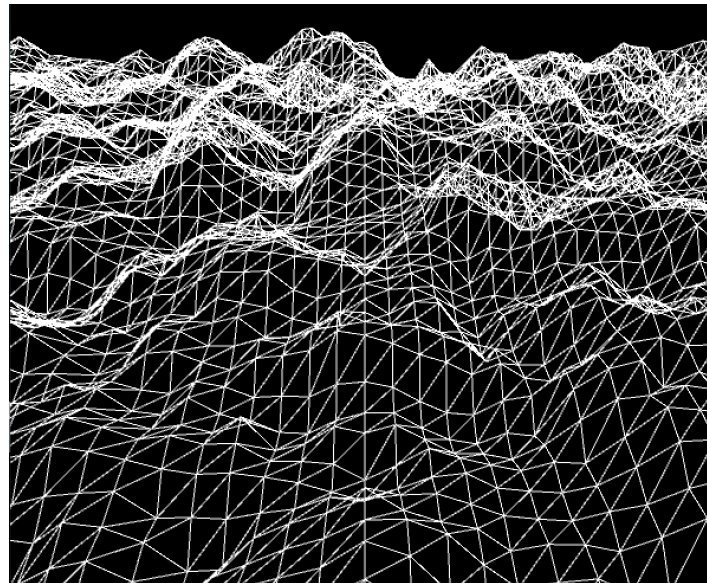


# Data

## From “Visualization” to “Physicalization”



# Agenda

- What is data physicalization?
- Workshop/Demo: how to deform a 3D mesh with data
  - How to record data
  - How to deform a mesh





# information visualisation

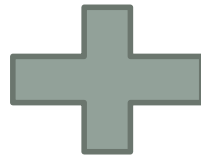
“... is the use of computer-supported, **interactive**, visual representations of **abstract** data to **amplify cognition**”

Card, Mackinlay & Shneiderman 1999

- A more concrete definition of Information Visualization

# Data “Visualization”

Scientific Data



Artistic Expression





<https://www.youtube.com/embed/Rmch41uLXRU>

<https://informationisbeautiful.net/visualizations/making-data-out-of-art-a-short-film/>

# Data as Art – What is the intent?

Use data and artistic visualizations to tell stories with the vast amounts of information that we are creating and compiling.

# Some demo of DataArt

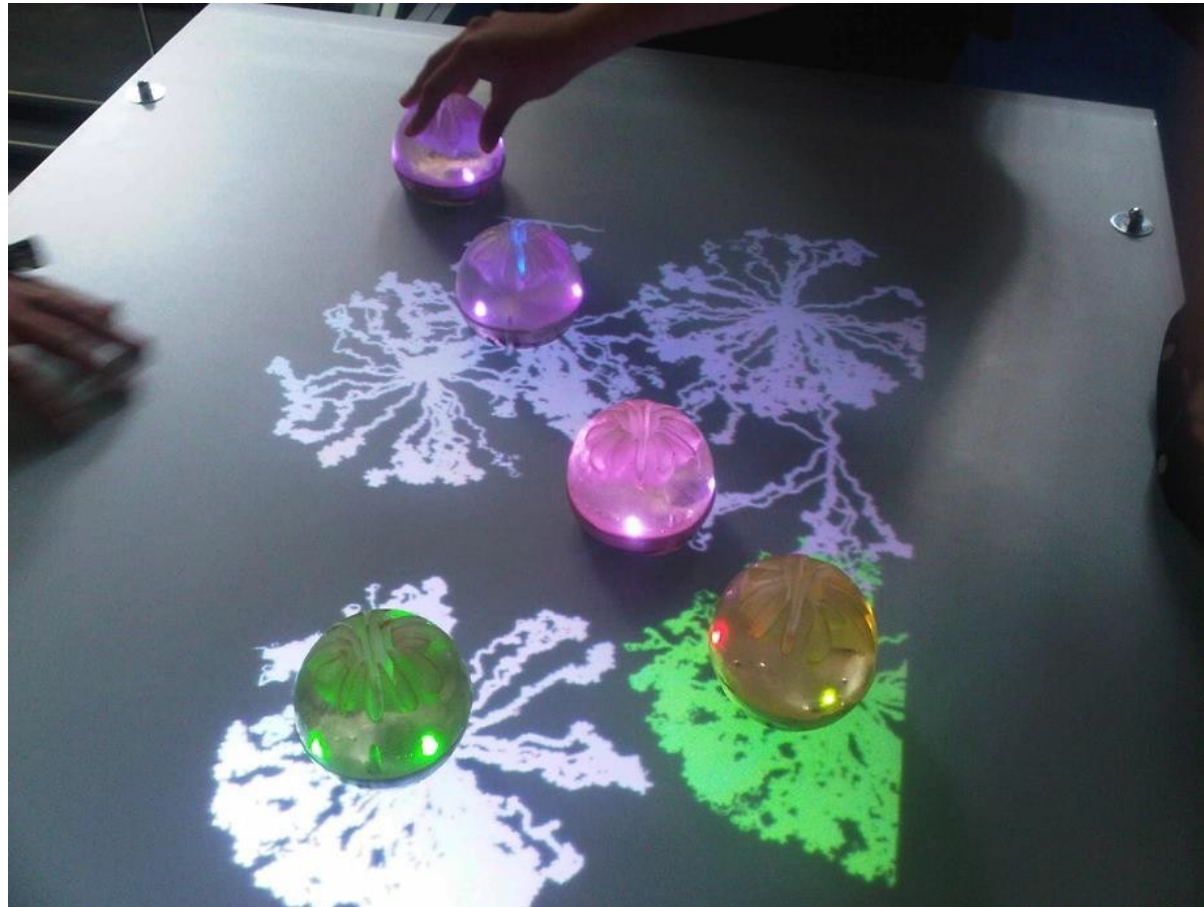
- <http://data-art.net/>

Does “Visualization” always mean virtual animation?



# Interactive Data Visualization with Tangible User Interface (TUI)

- Touch the information



# Tangible Information Visualization

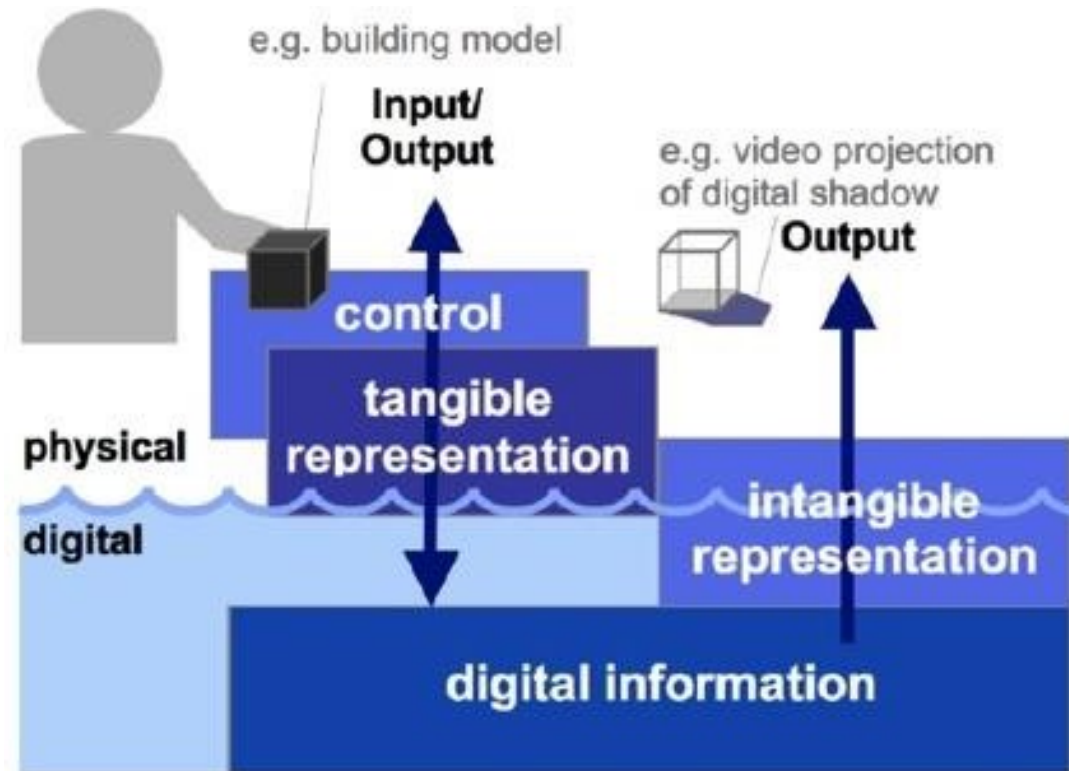
- Reefs on The Edge
  - Look to coral lifespan vs change in sea temperature



<http://www.caitilindeberigny.com/reefs-on-the-edge>

# Tangible User Interface Concept

- Using natural human motoric as a way to control
- Interface beyond the world of Window, Icon, Menu and Pointers (WIMP)
- Giving physical form to an underlying data information



# Tangible/Physical Data Visualization

- News by Hans Haacke, 1969



<http://www.medienkunstnetz.de/works/nachrichten/>





# Tangible/Physical Data Visualization

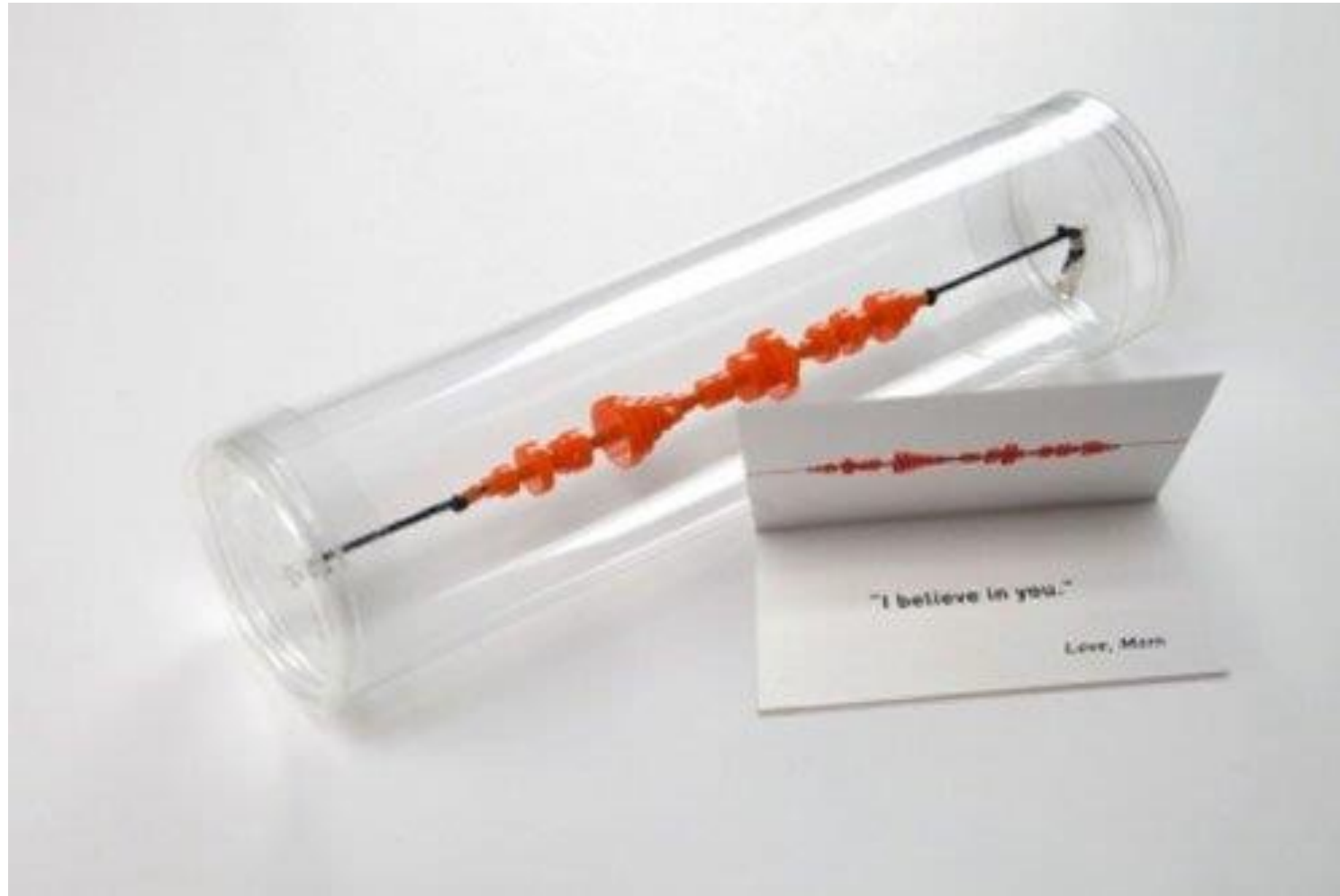


<https://www.adriensegal.com/tidal-datum>

Adrien Segal  
Tide Table, 2007

# Tangible/Physical Data Visualization

- 3D-printed soundwave

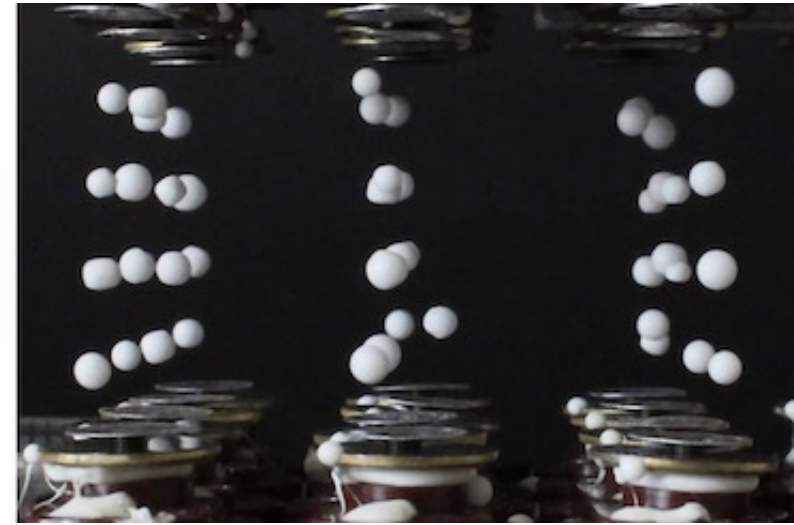
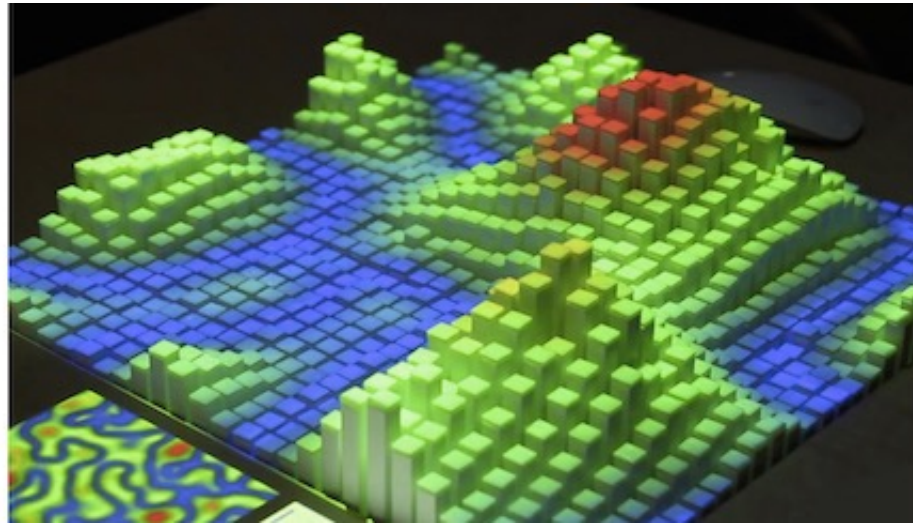


# **TED**Archive

**Previously unpublished talks from TED conferences**

<https://www.youtube.com/watch?v=RObVm8vDV6w>

# Data Physicalization



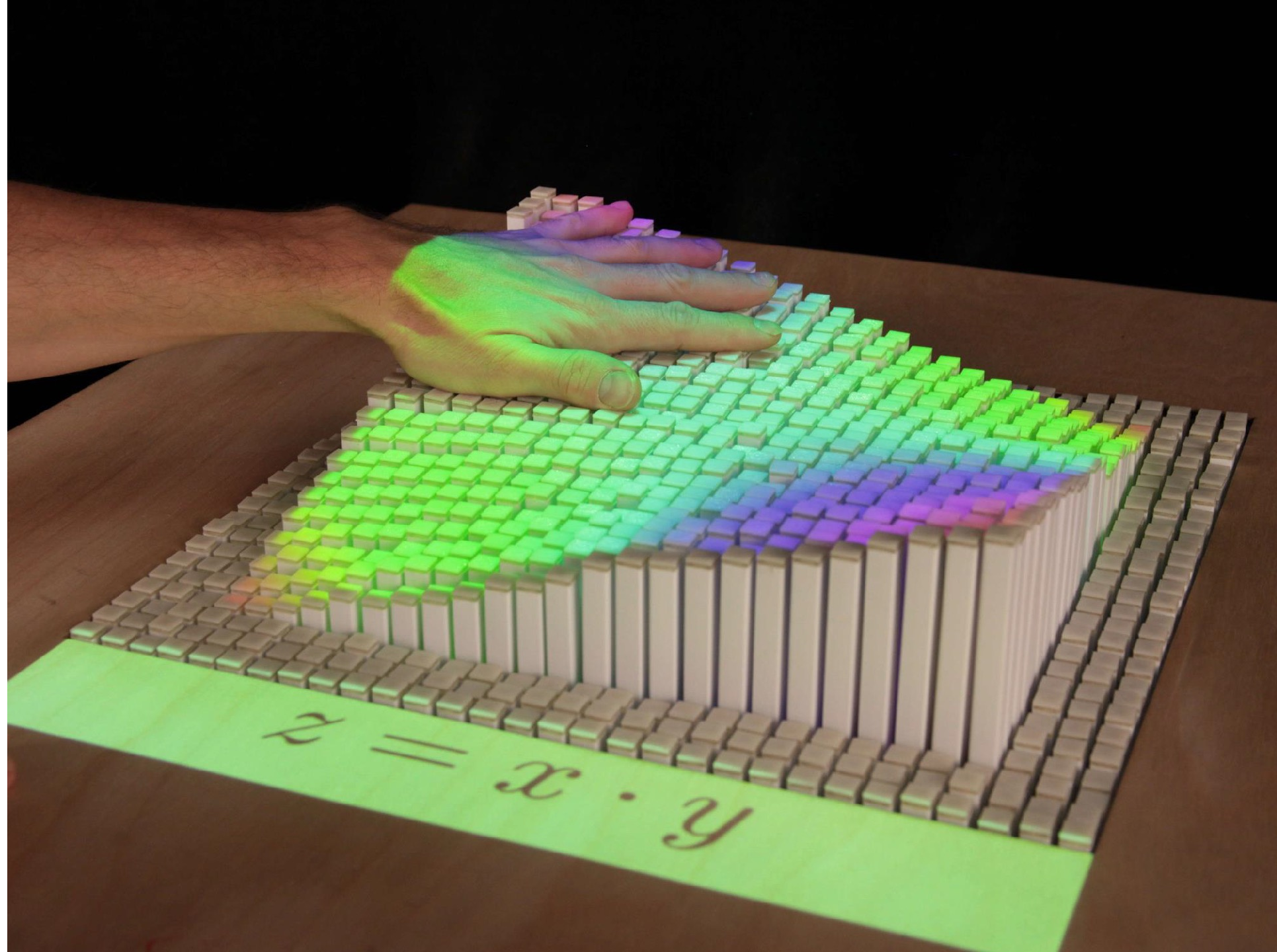














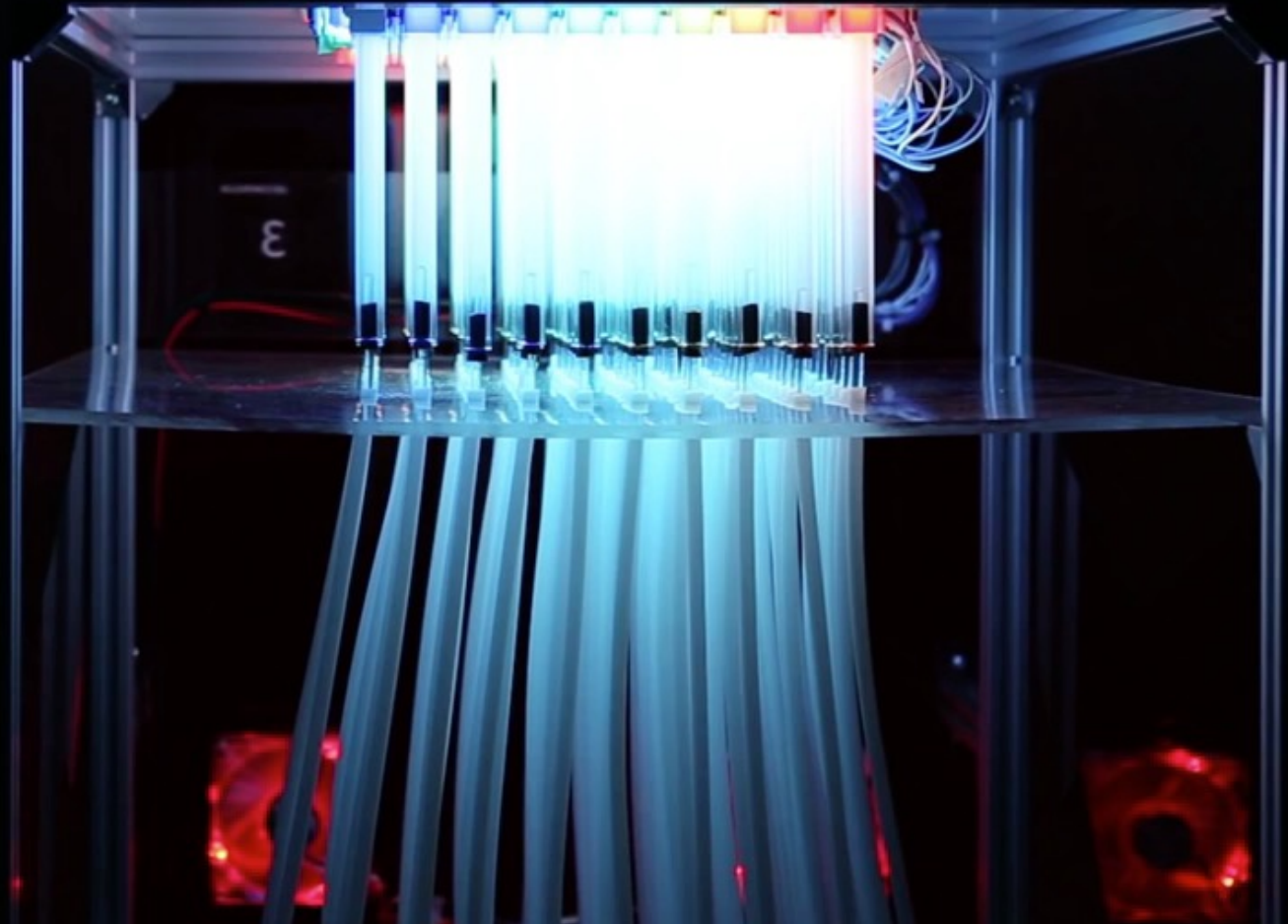


# Exploring Interactions with Physically Dynamic Bar Charts

Faisal Taher <sup>1</sup>  
John Hardy <sup>1</sup>  
Abhijit Karnik <sup>1</sup>  
Christian Weichel <sup>1</sup>  
Yvonne Jansen <sup>2</sup>  
Kasper Hornbæk <sup>2</sup>  
Jason Alexander <sup>1</sup>

<sup>1</sup> Lancaster University, UK

<sup>2</sup> University of Copenhagen, Denmark



<https://www.youtube.com/watch?v=UC6l6dy04zl>

# We have seen...

- What is Data Visualization

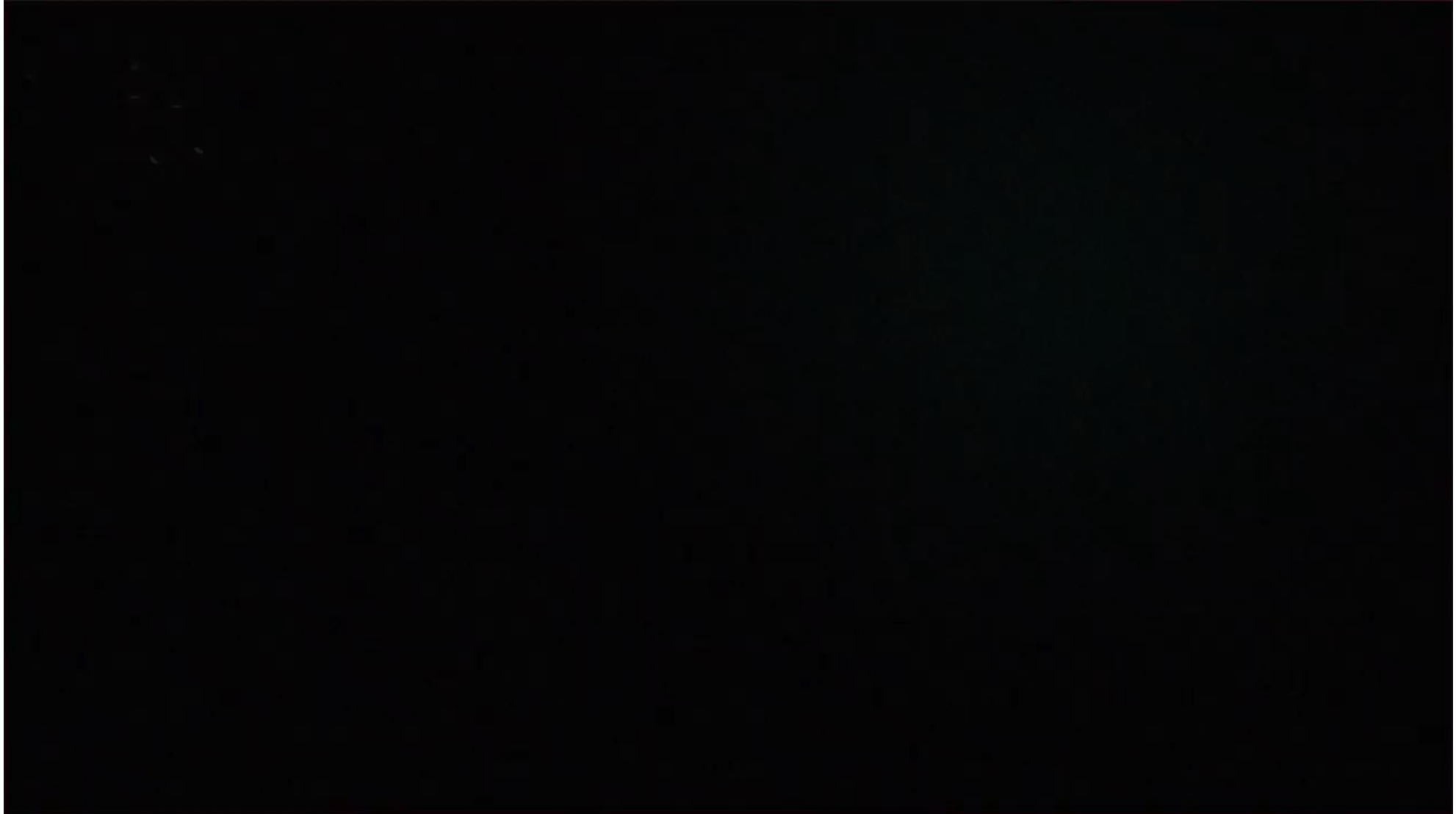
## Data as Art – What is the intent?

Use data and artistic visualizations to tell stories with the vast amounts of information that we are creating and compiling.

- What is Data Physicalization?

- Giving physical form to an underlying data information
- Allowing users to touch the information

# Bio-data Physicalization: Mental Fabrication



<https://www.youtube.com/watch?v=ASSWJDsDfZM>

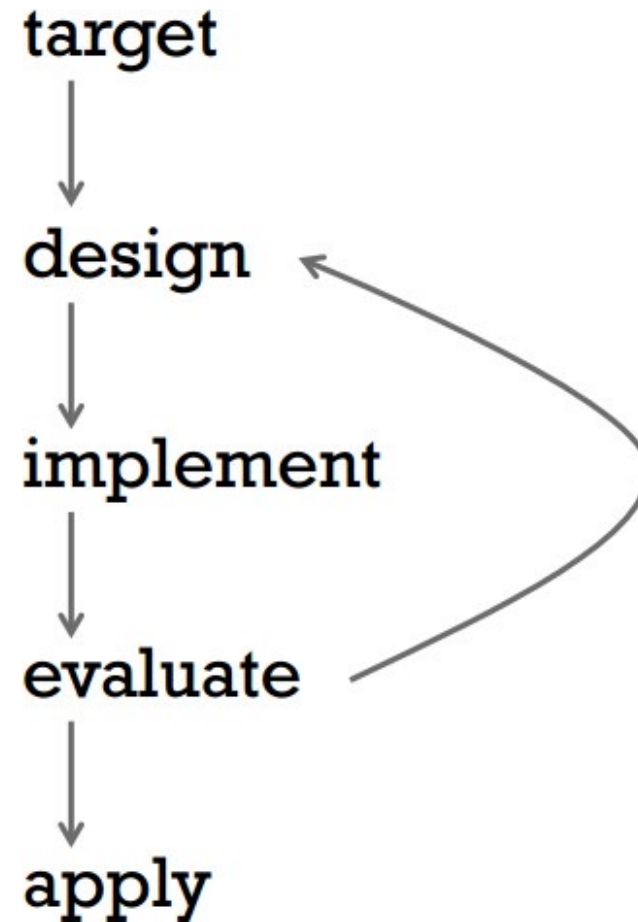
<https://www.youtube.com/watch?v=IJndU9wCpyw>



How to design/make/fabricate  
an (Tangible) Data Visualization?

# Standard User-Center Design Process

- It also works in designing information visualization



Storing the data: Arduino -> Processing -> Excel

# Storing the data: PlantSpikeBox -> Excel

- You need another open-source software
  - Audacity: <https://www.audacityteam.org/>



# Visualize the data

- Scientific Graphs
- Visual Rendering
  - In 3D?
  - Create a 3D mesh of the plant data



# Using our body data to animate a 3D mesh

