

# Tangible Interaction

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# Objectives

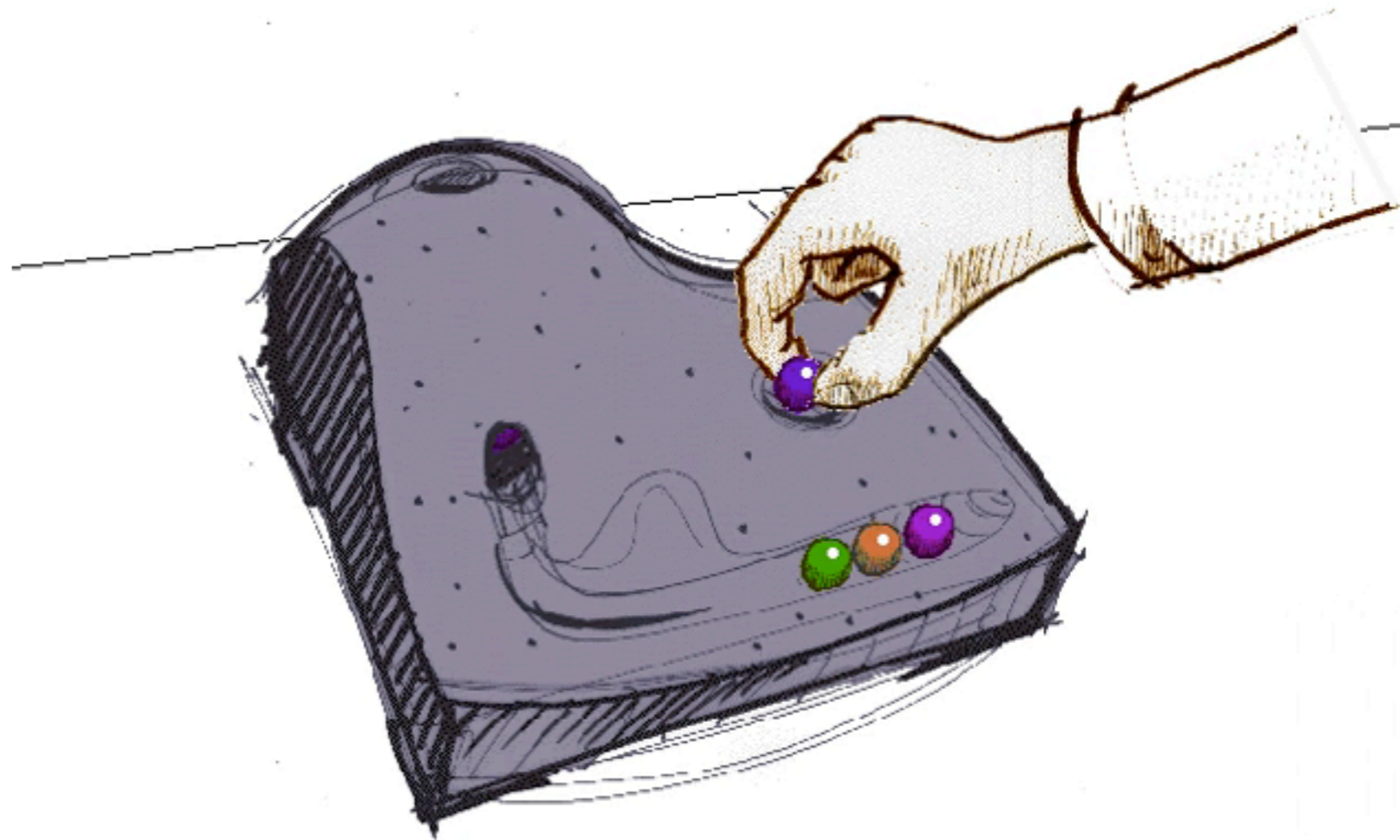
Answering basic questions, i.e.:

- What are TUI?
- What is their story?
- What are they good for?
- How to make them?
- What are their limitations?
- What is their future?

# **Tangible User Interfaces: What are they?**

# Tangible User Interfaces: What are they?

Interfaces involving physical objects  
that can be grasped



Example:  
Durrell Bishop's  
Answering Machine

# Tangible User Interfaces: What are they?



## Graphical User Interfaces

interfaces usually limited  
to standard screen+keyboard+mouse

# Tangible User Interfaces: What are they?



## Virtual Reality Interfaces

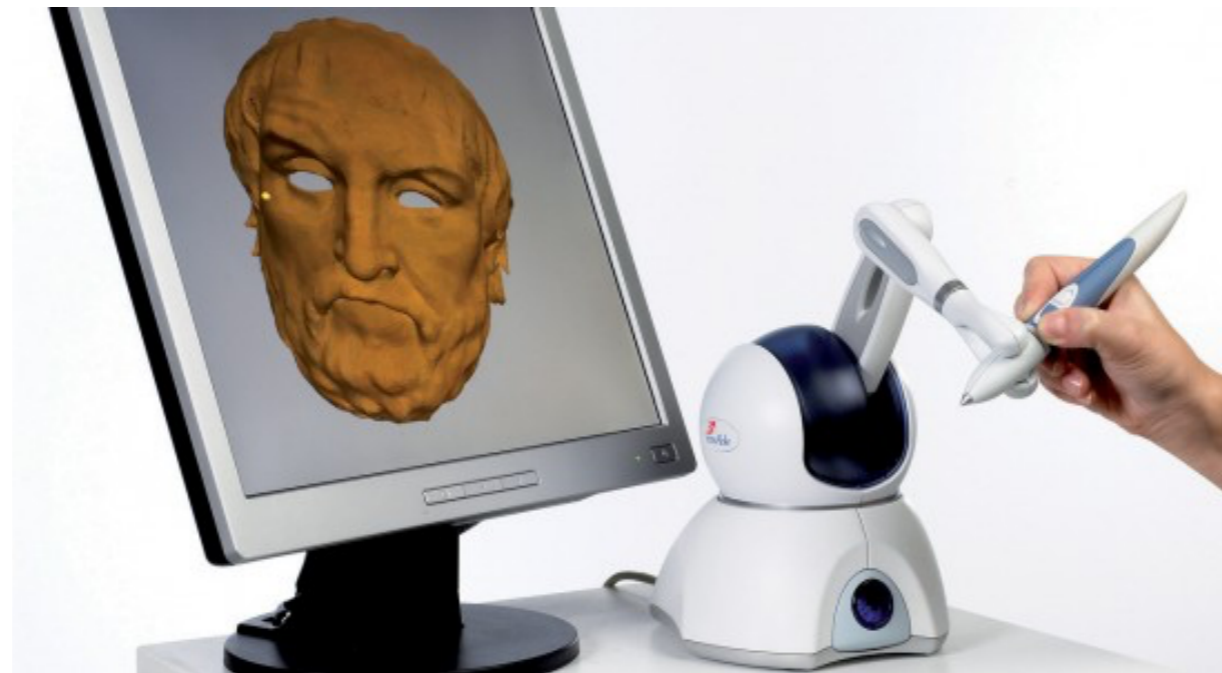
interfaces to immerse the user in a digitally generated world

# Tangible User Interfaces: What are they?



**Augmented Reality (AR) and Augmented Virtuality (AV)**  
Tangible Interfaces belong to AR+AV

# Tangible User Interfaces: What are they?



## Haptic Interaction

Tangible Interfaces belong to Haptic:  
Both involve touch and manipulation,  
but haptic usually not passive



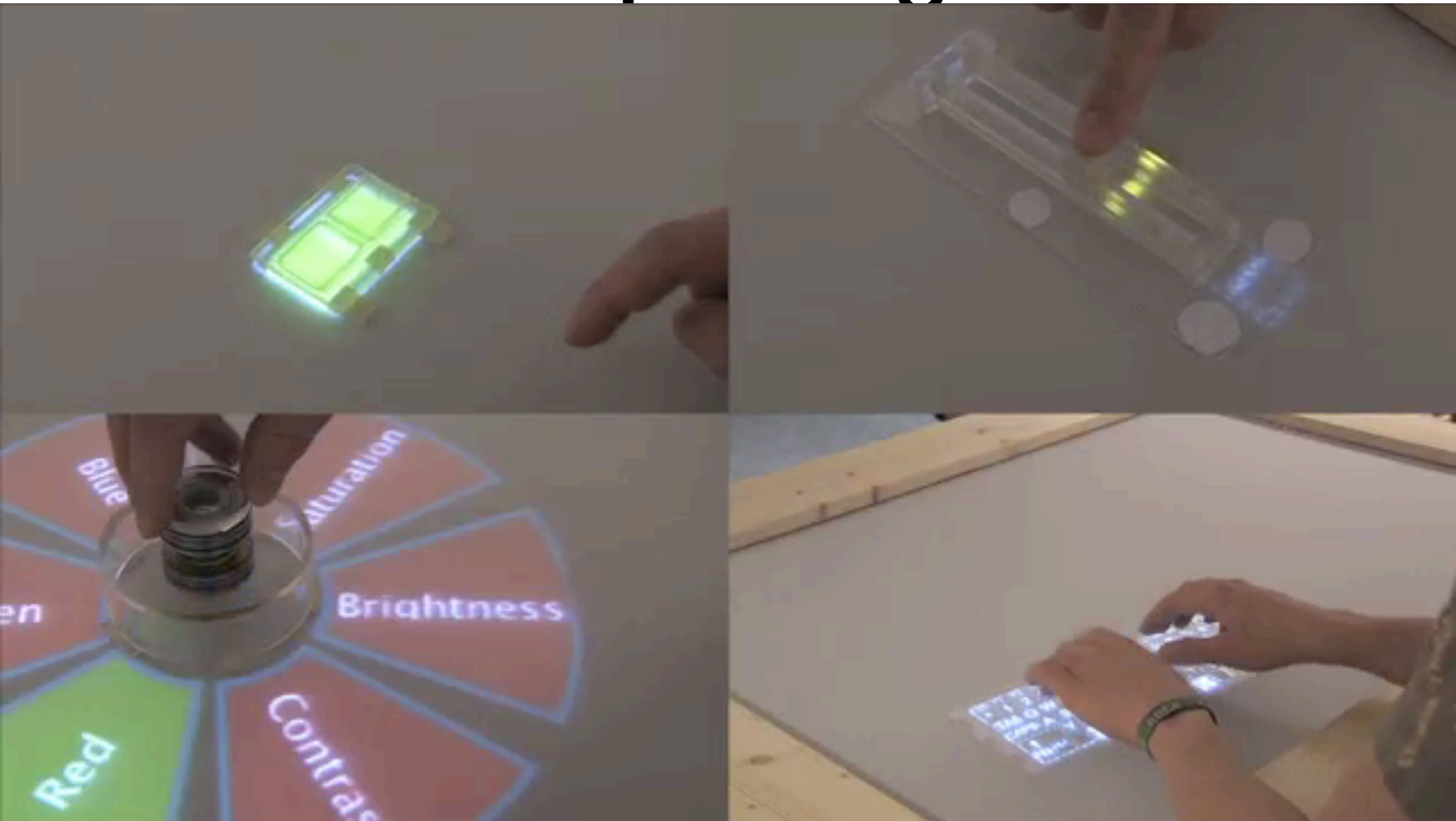
# Tangible User Interfaces: What are they?



## Internet of Things

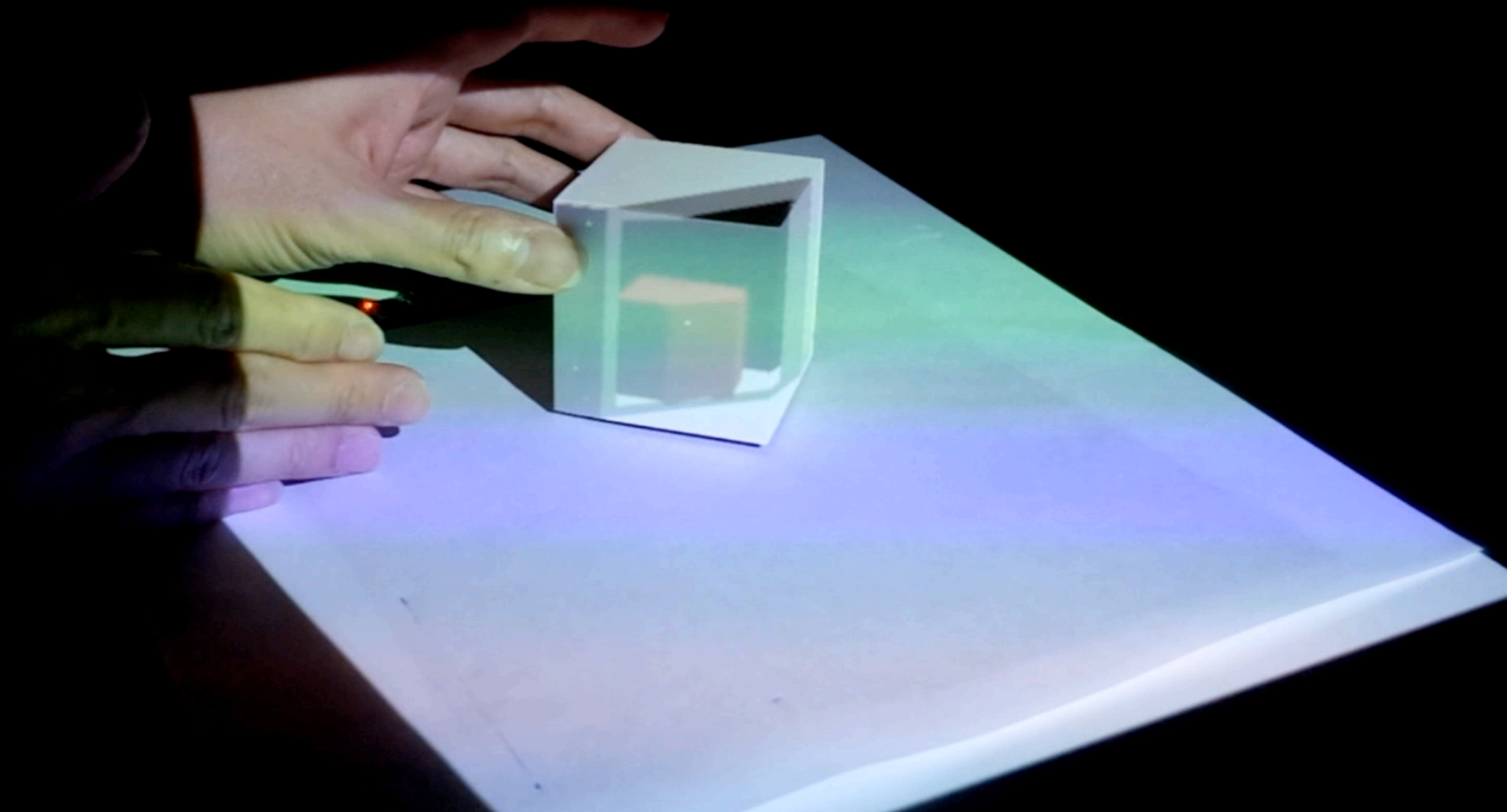
TUI not necessarily connected to Internet  
If so, can be through a computer

# Spread: GUI paradigm



# Spread: Augmented Reality paradigm

Section Cut to See Inside



# Spread: visualisation tasks

<https://vimeo.com/106053696>

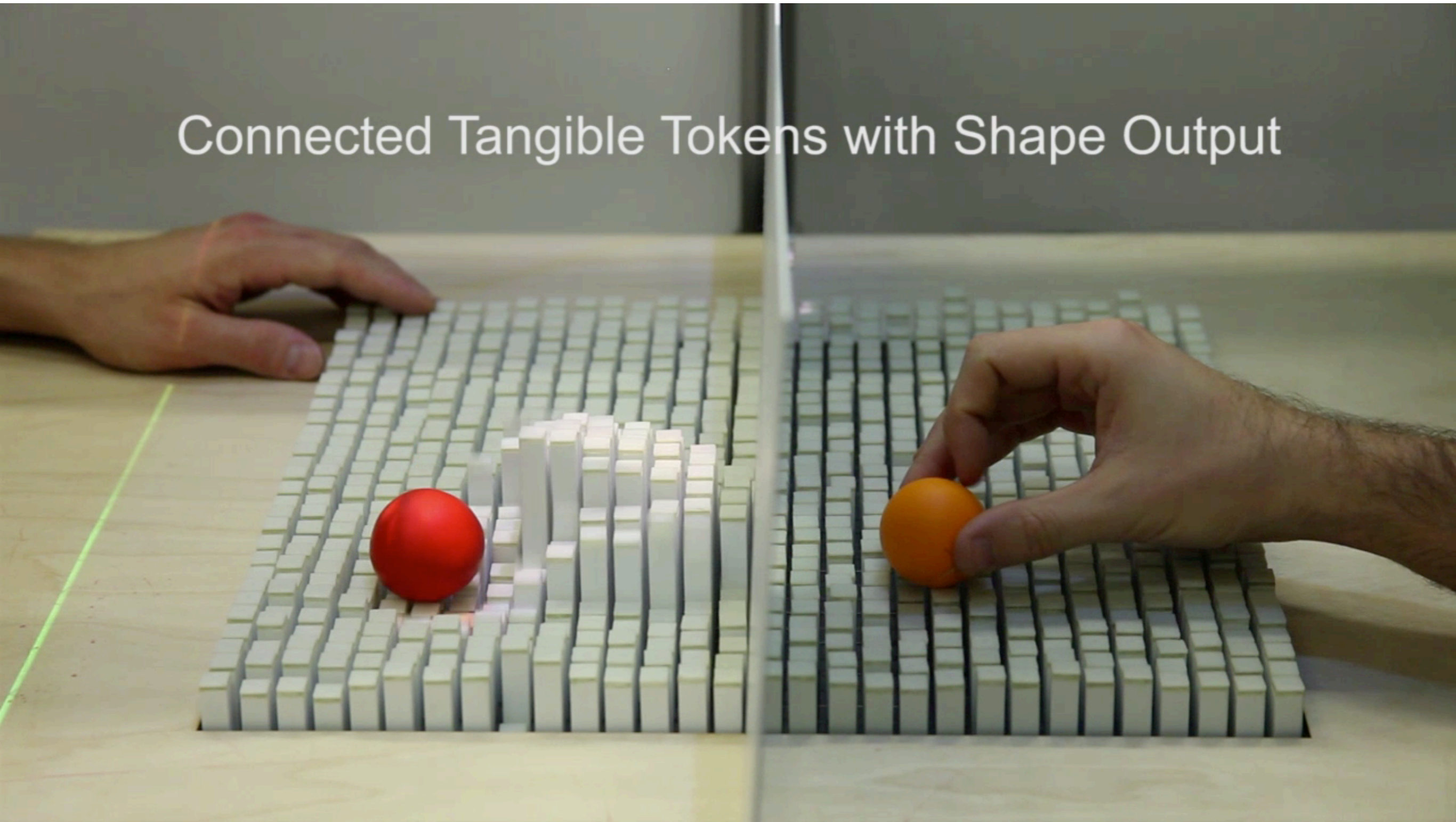
<https://vimeo.com/106053695>

<http://dataphys.org/list/>



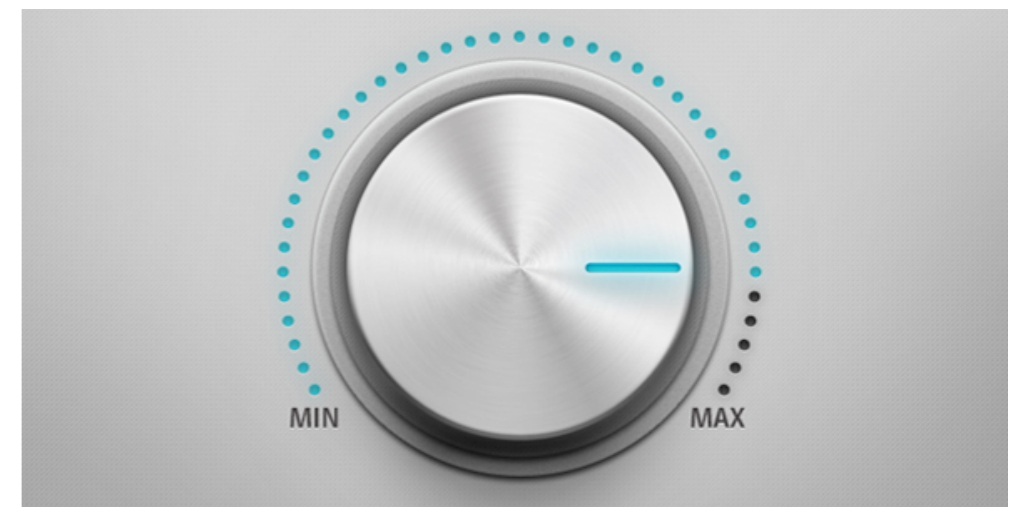
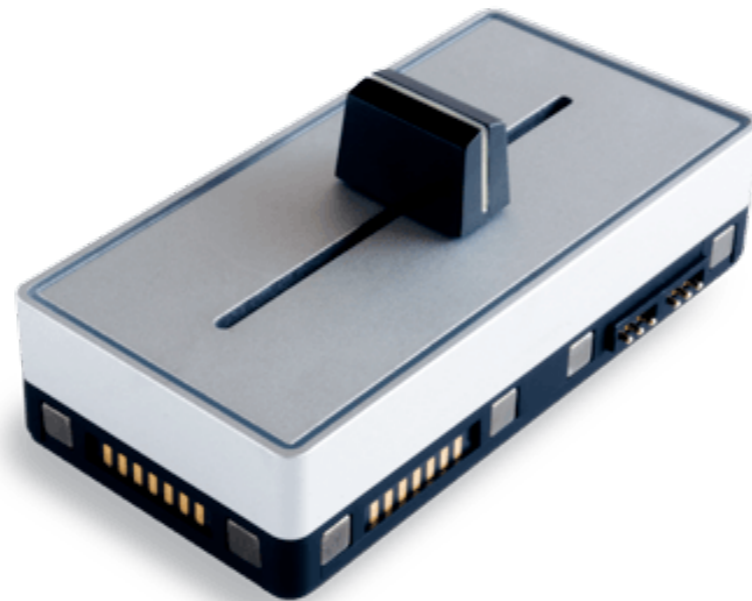
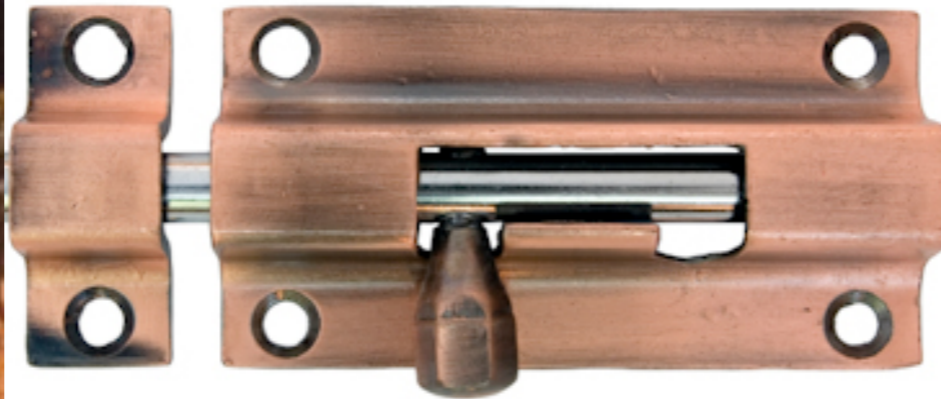
# Spread: Remote collaboration tasks

Connected Tangible Tokens with Shape Output



**What is their story?**

# Manipulation of tangible tools has always been here...

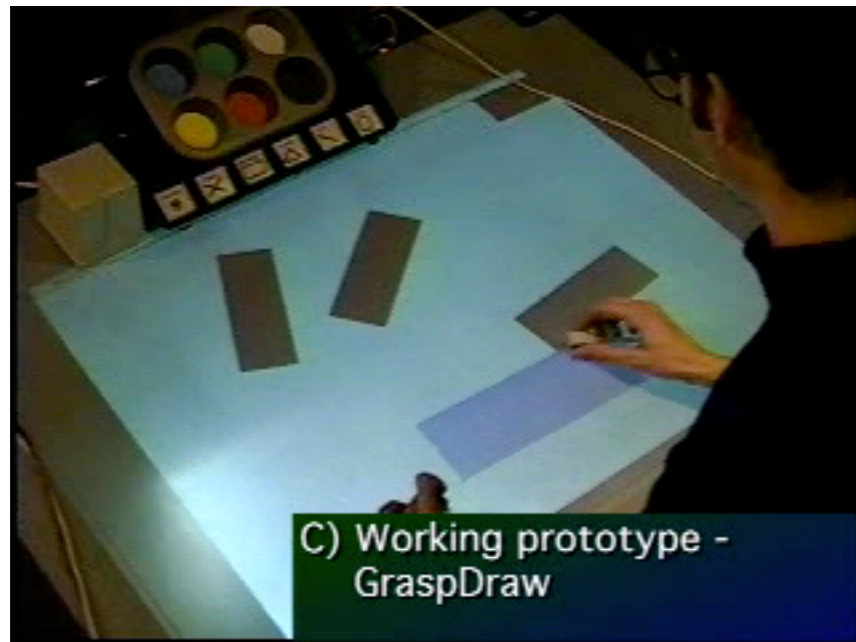


... and is still here





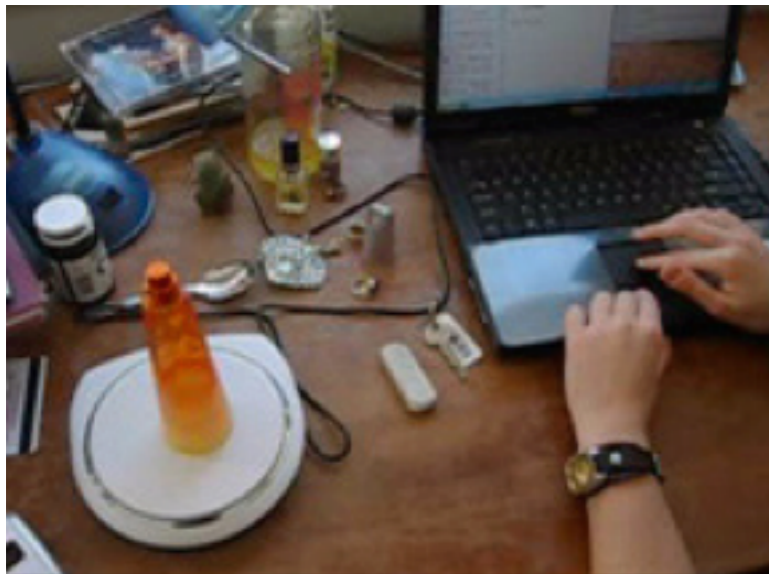
# Seminal papers



# Early works on Tangible User Interfaces

- DataTiles: Tangible overlay mixing Tangible and Graphical Interaction  
<https://www.youtube.com/watch?v=cmD8EKWxD4M>
- Containers: mediaBlocks  
<http://vimeo.com/48827402>
- metaDesk  
<http://vimeo.com/44545109>
- 3D animation with tangible sliders (1996)  
<https://www.youtube.com/watch?v=SnDHjY5aD5c>

# Example of Tangible User Interfaces



<http://dl.acm.org/citation.cfm?doid=1125451.1125582>

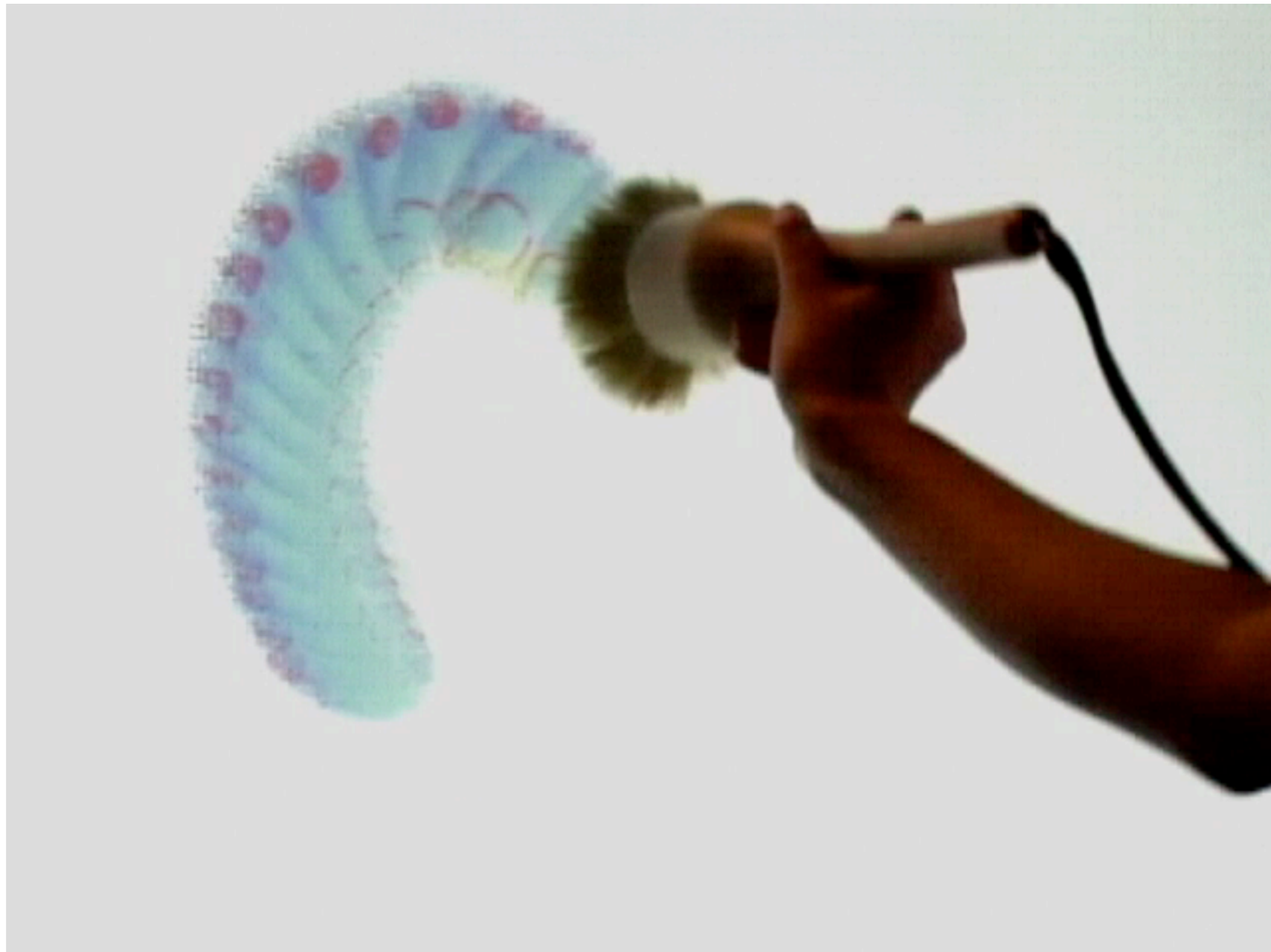
# Example of Tangible User Interfaces



<https://www.youtube.com/watch?v=0h-RhyopUmc>

<https://www.youtube.com/watch?v=MPG-LYoW27E>

# Example of Tangible User Interfaces



**I/O Brush**