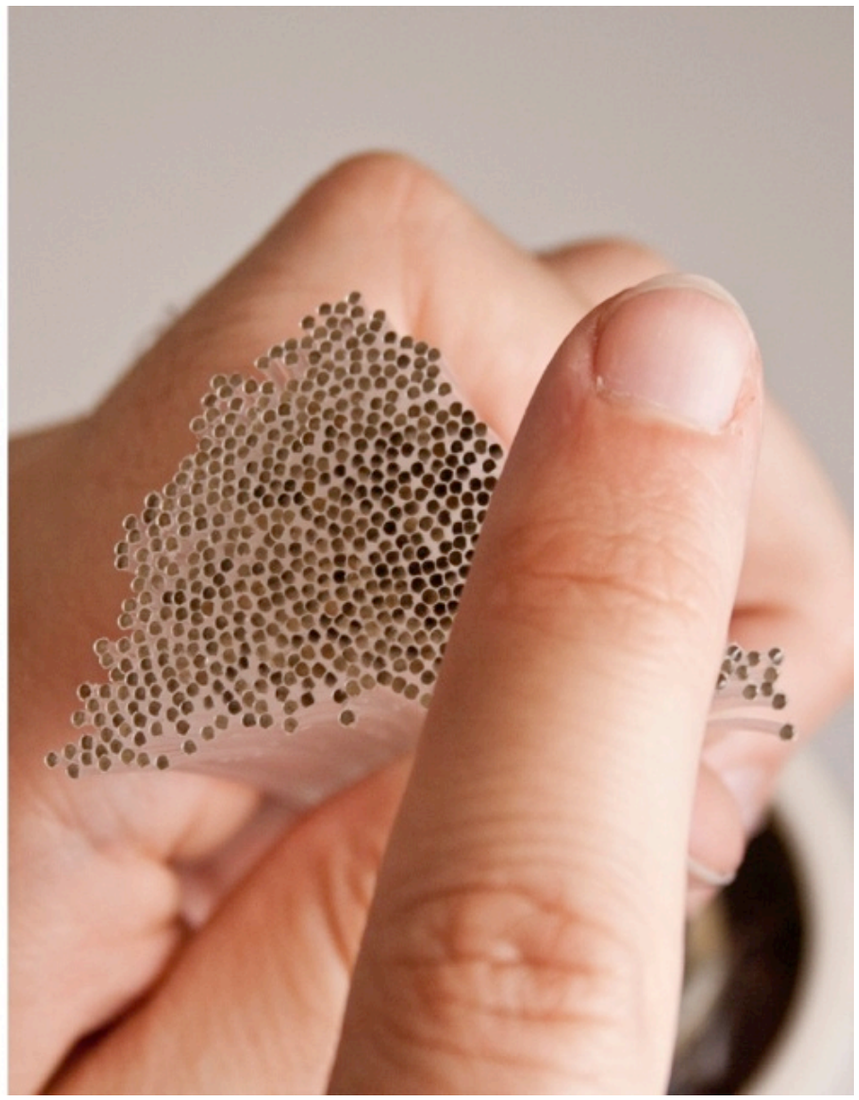
Rock-Paper-Fibers

Bringing Physical Affordance to Mobile Touch Devices



Frederik Rudeck

Patrick Baudisch

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Preview

HPI

Motivation

on current touch devices,
every interaction feels the **same**

Microsoft Surface™

Jordà, S., et al. The reacTable. TEI ’07.

Rekimoto, J., et al. DataTiles. CHI ’01.

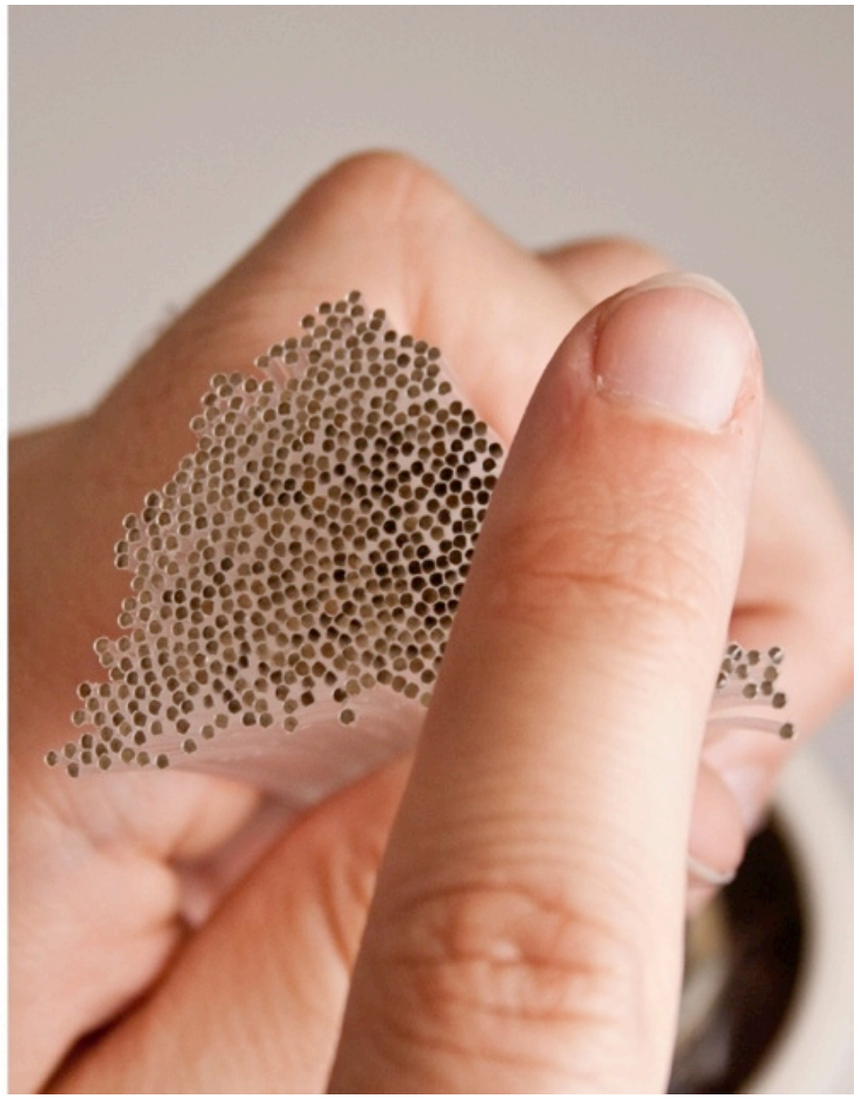
Goal:

bring **custom-shaped physical controls**
to mobile touch devices

Rock-Paper-Fibers

Main Idea:

create physical affordance by **reshaping the device**



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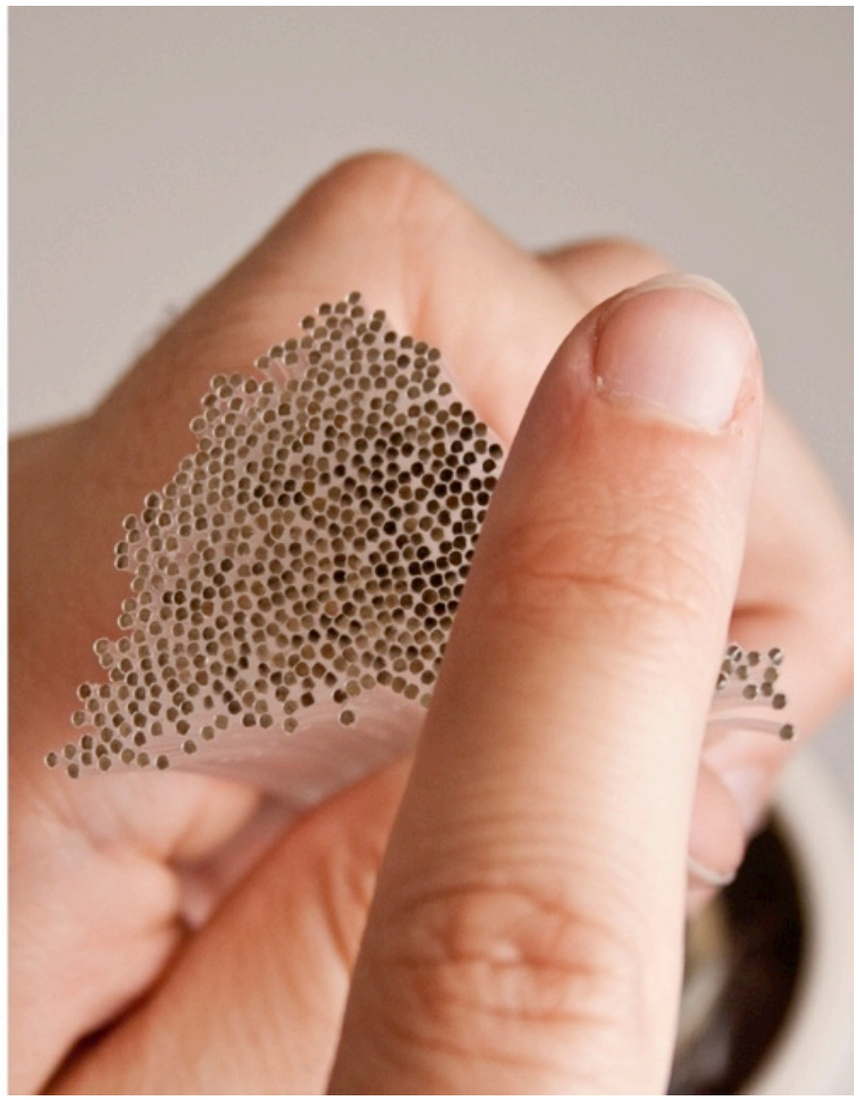


this limits users to one widget at a time,
but it is efficient using **bimanual** interaction

Benefit/Contribution:

- **physical affordance** by **deforming** the device as to best match the interaction at hand
- **mobility** by serializing the interaction

Limitations:

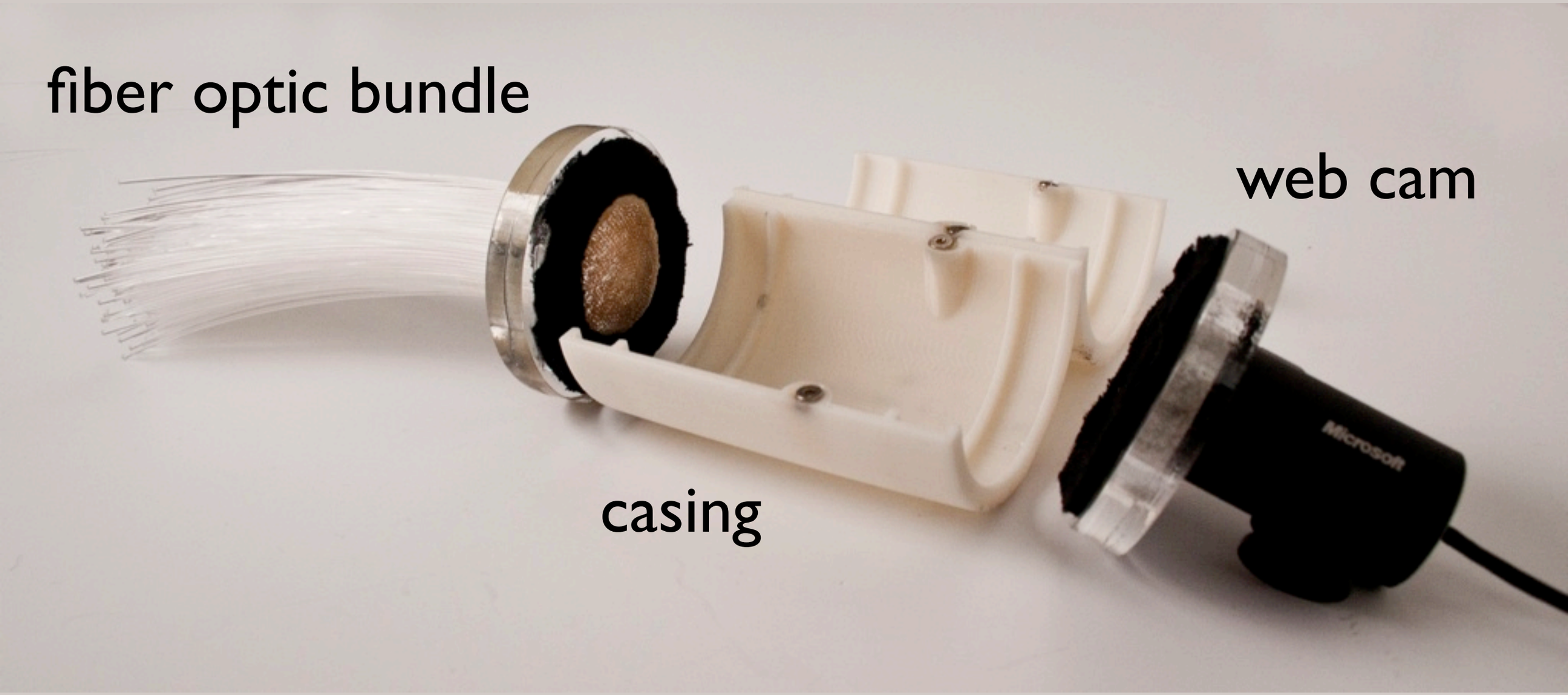
- repeated reconfiguration requires additional **time and manual skills**
- the range of **widgets** is limited

we address both later with **wedges&clamps**

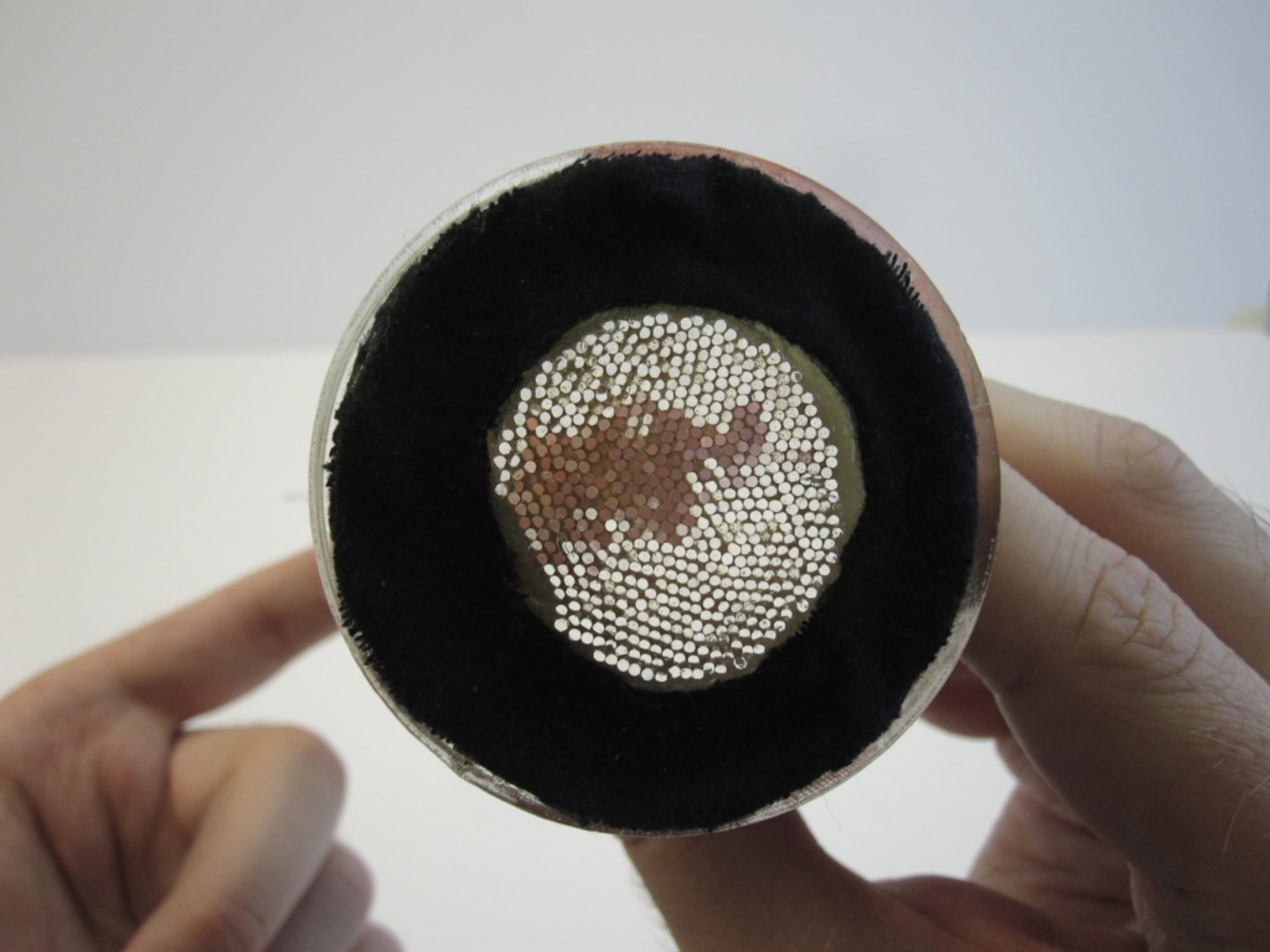
Hardware Prototype

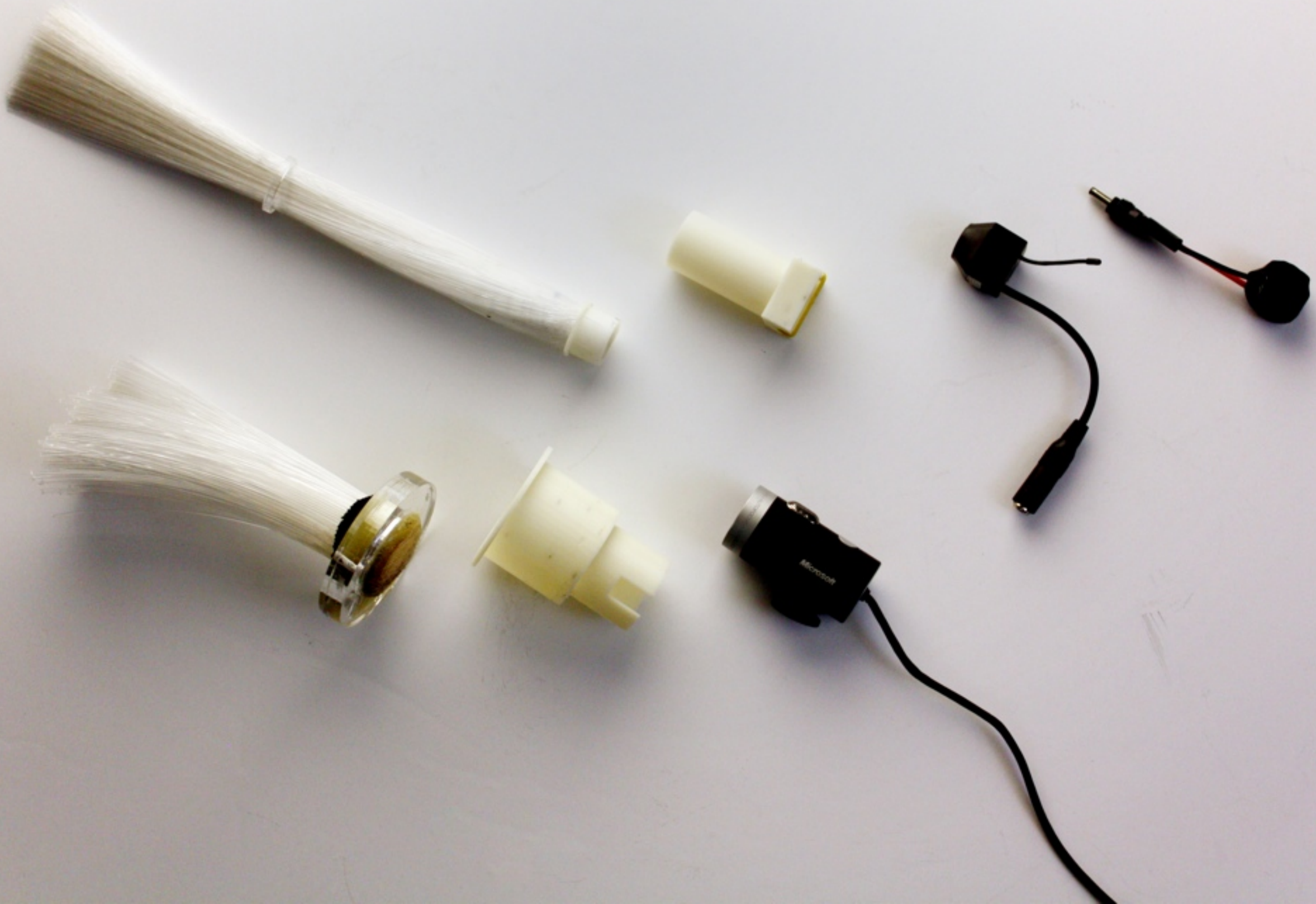
fiber optic bundle

web cam



casing

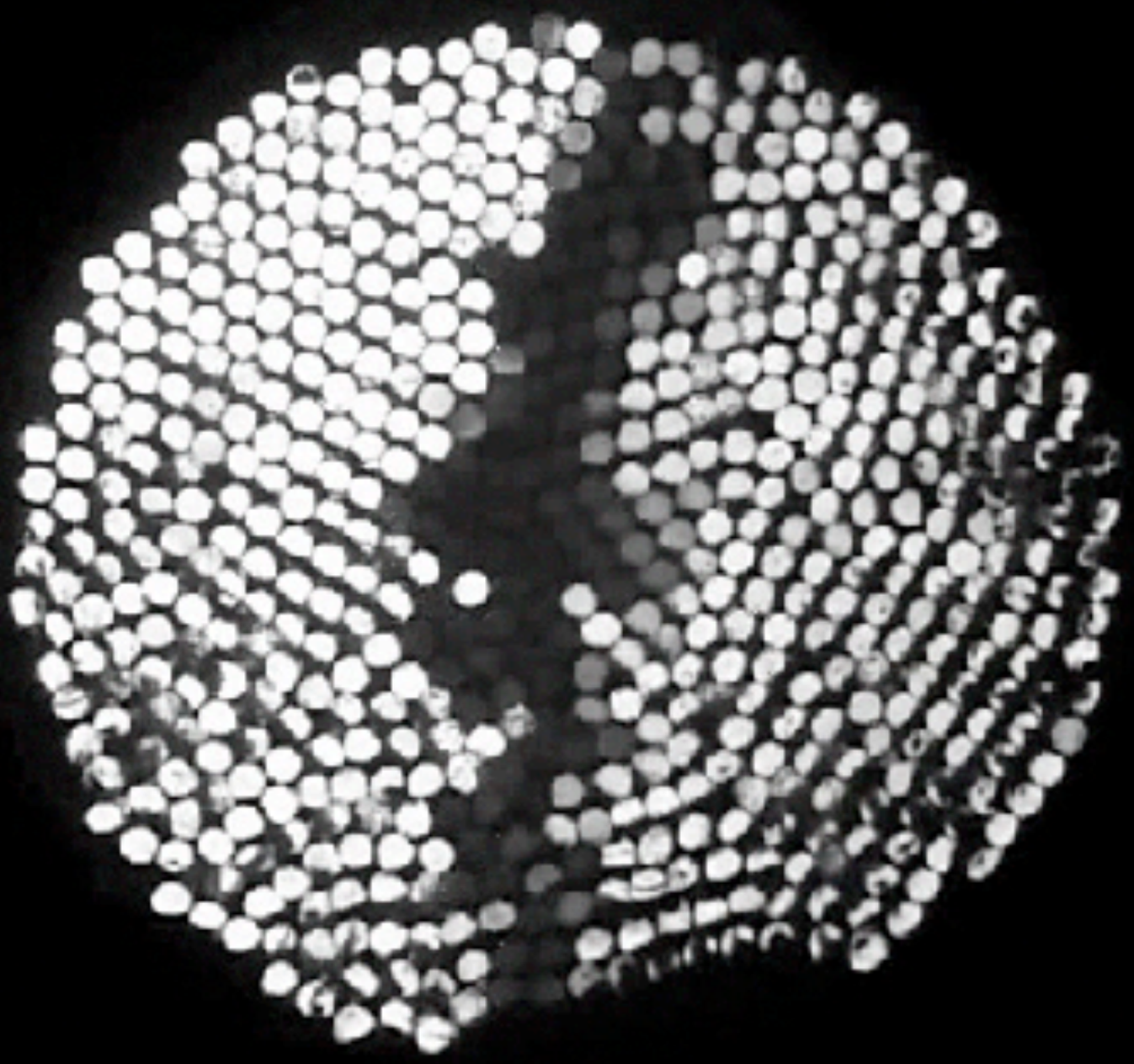



Microsoft

Recognition

Guessing Game:

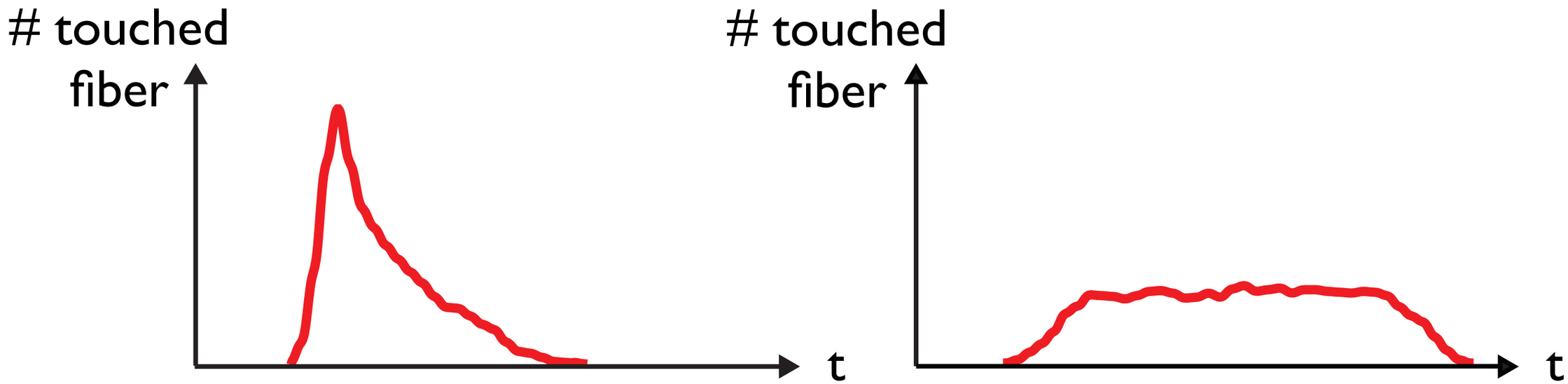
slider or play button

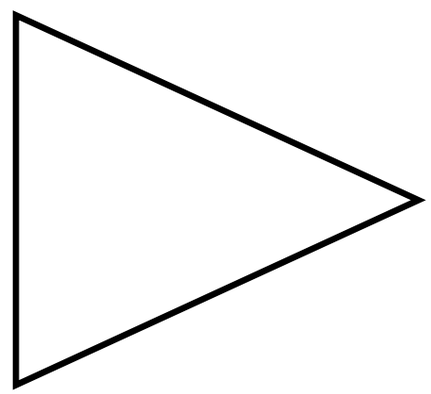


Challenge:

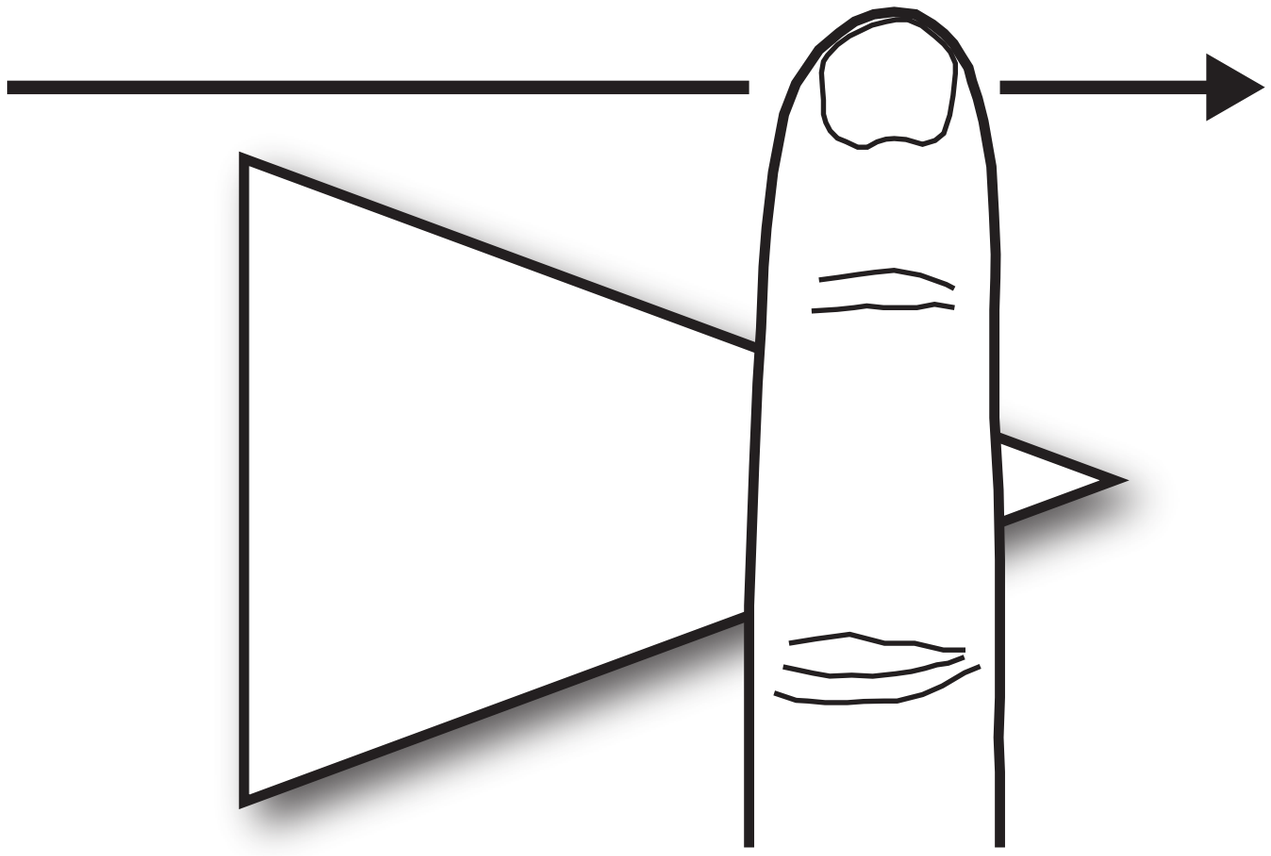
- fiber **location** is meaningless
- however, **number** of touched fibers is meaningful

count the **number** of touched fiber over **time**

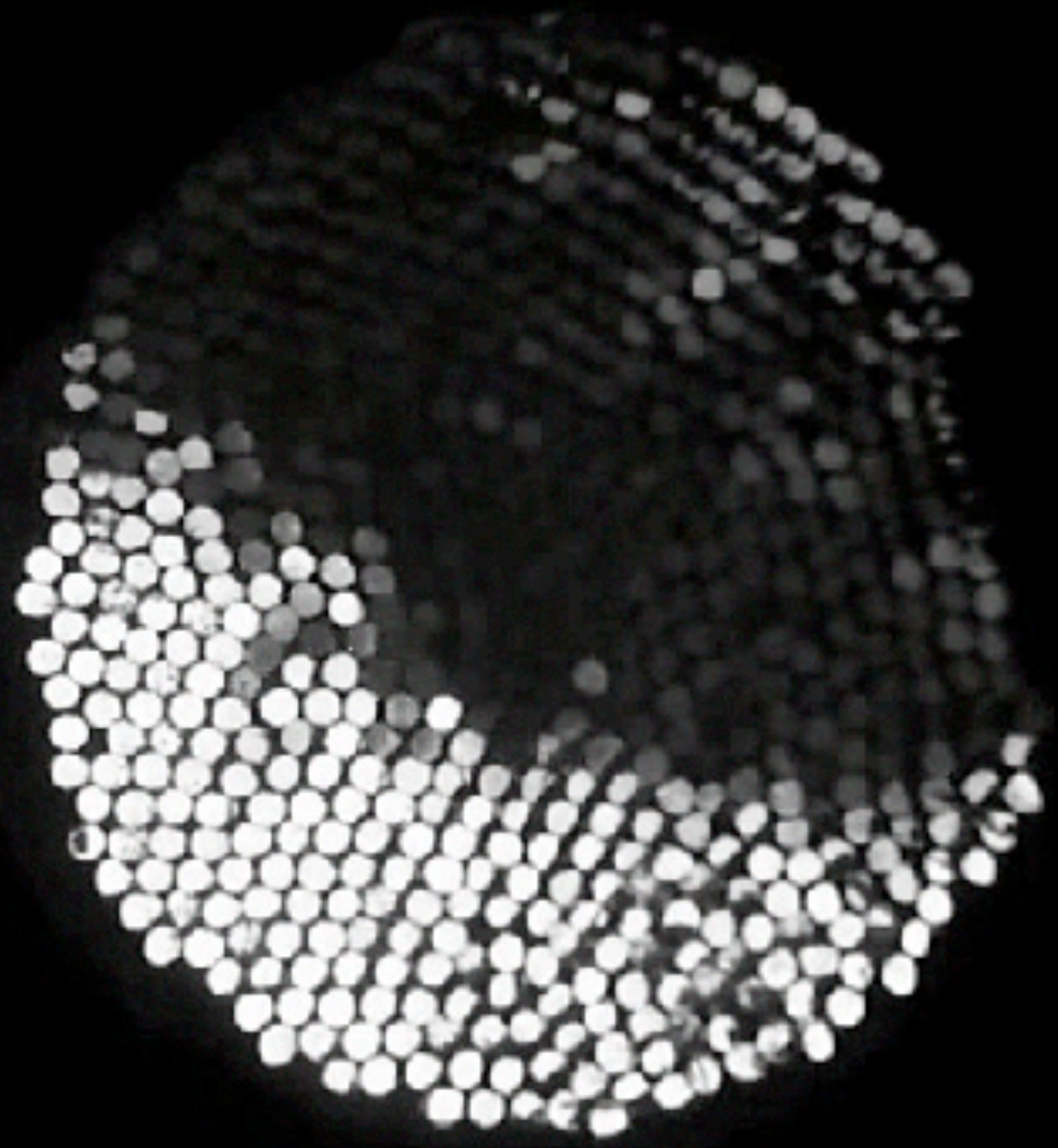




convolution of **finger** and **fiber bundle shape**

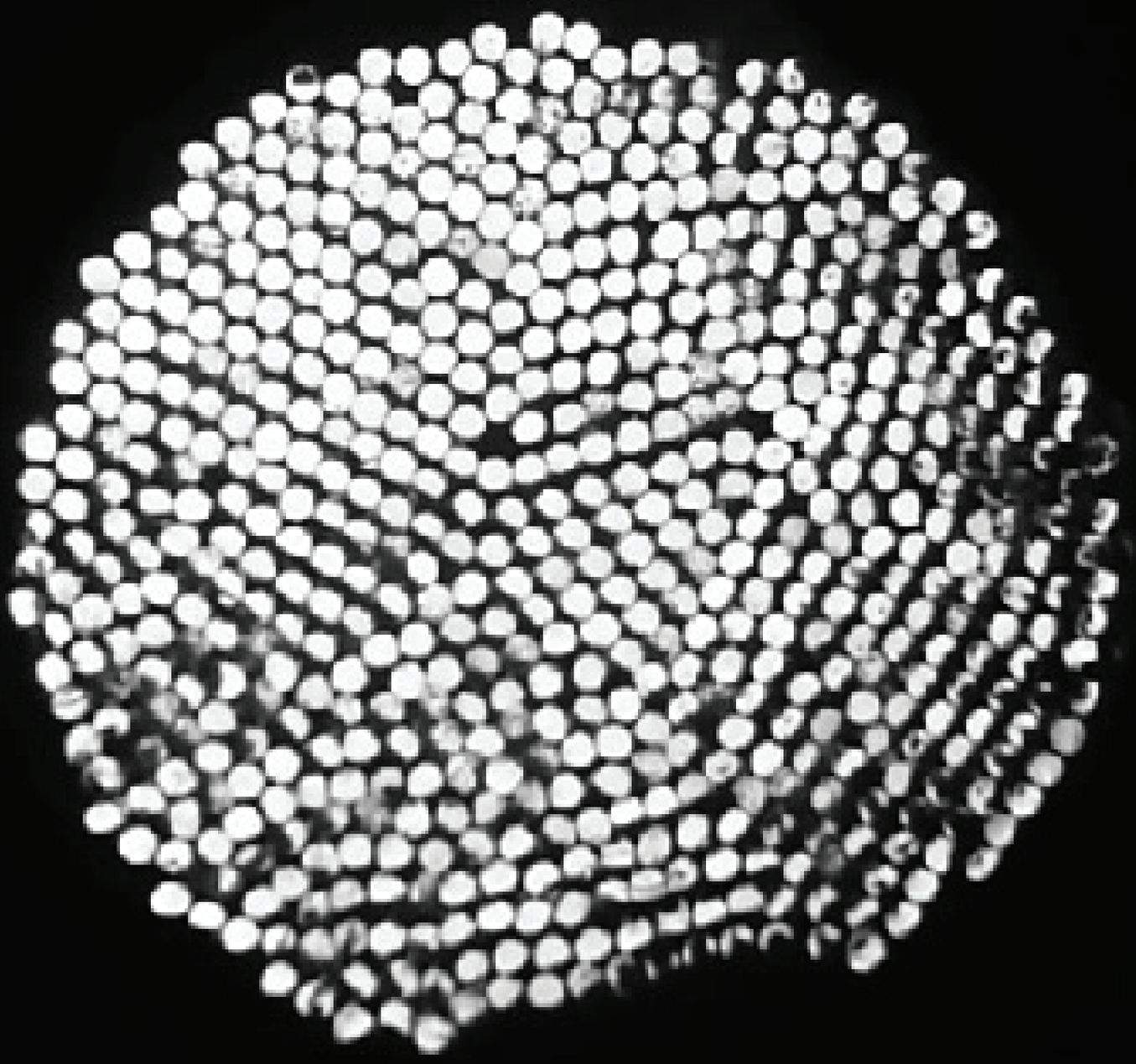


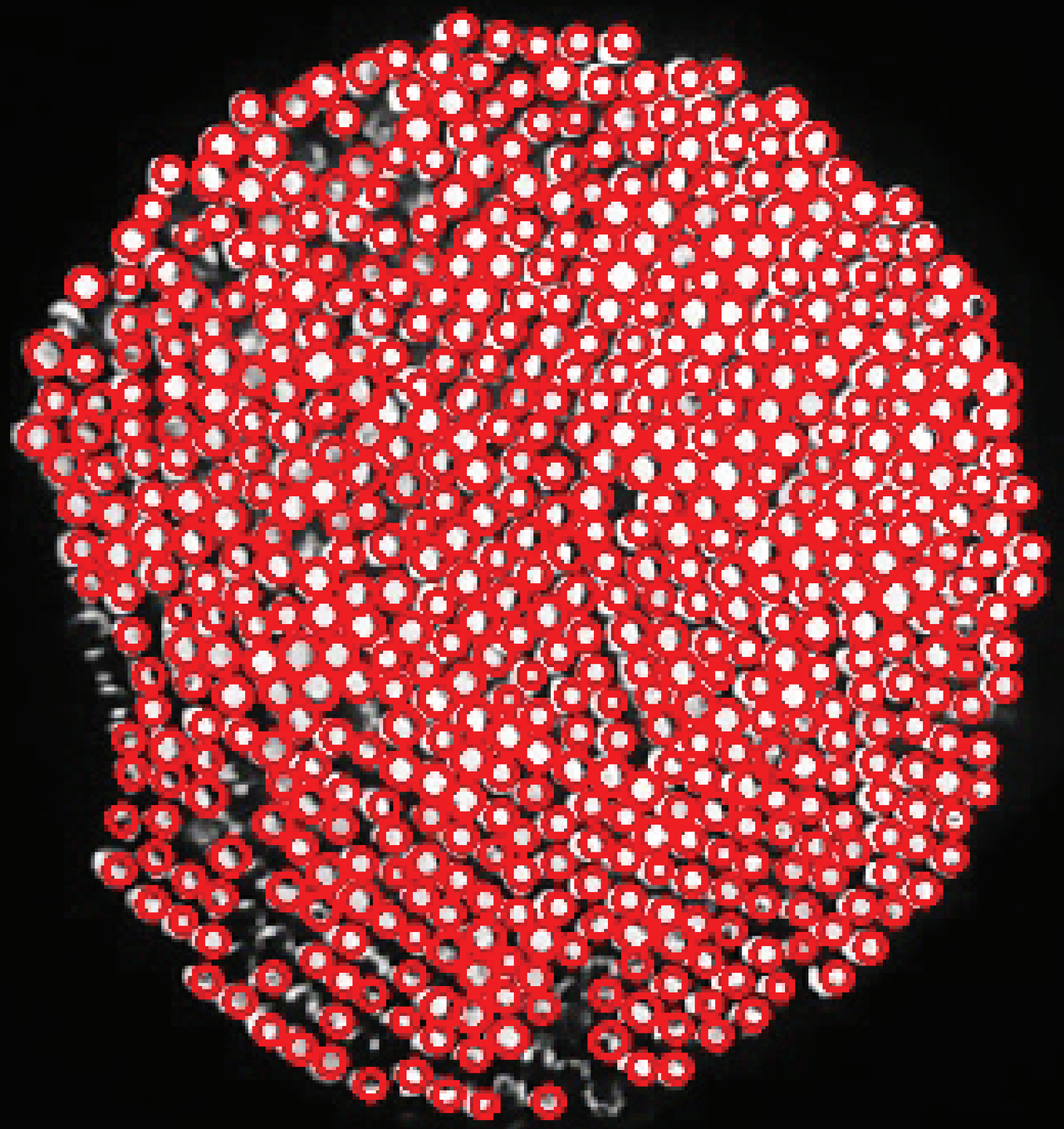
slider

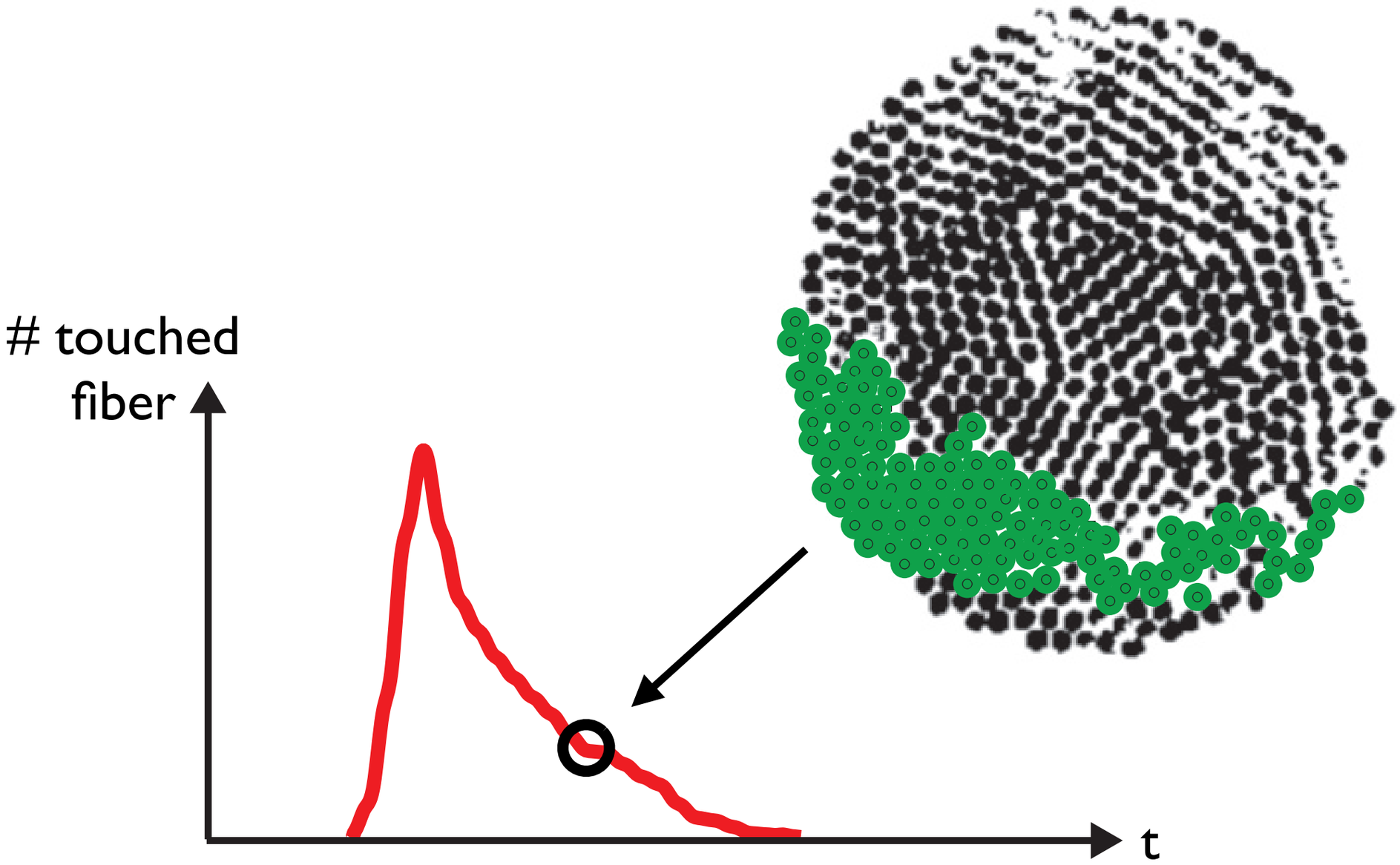


play button

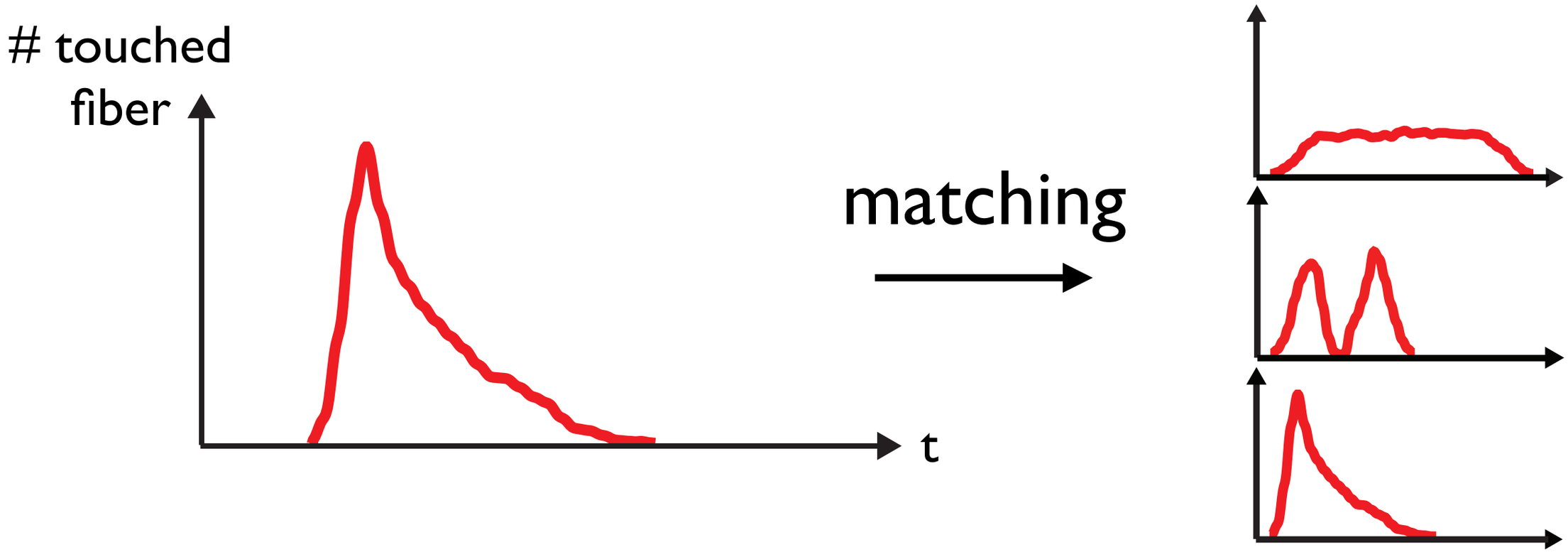
Processing



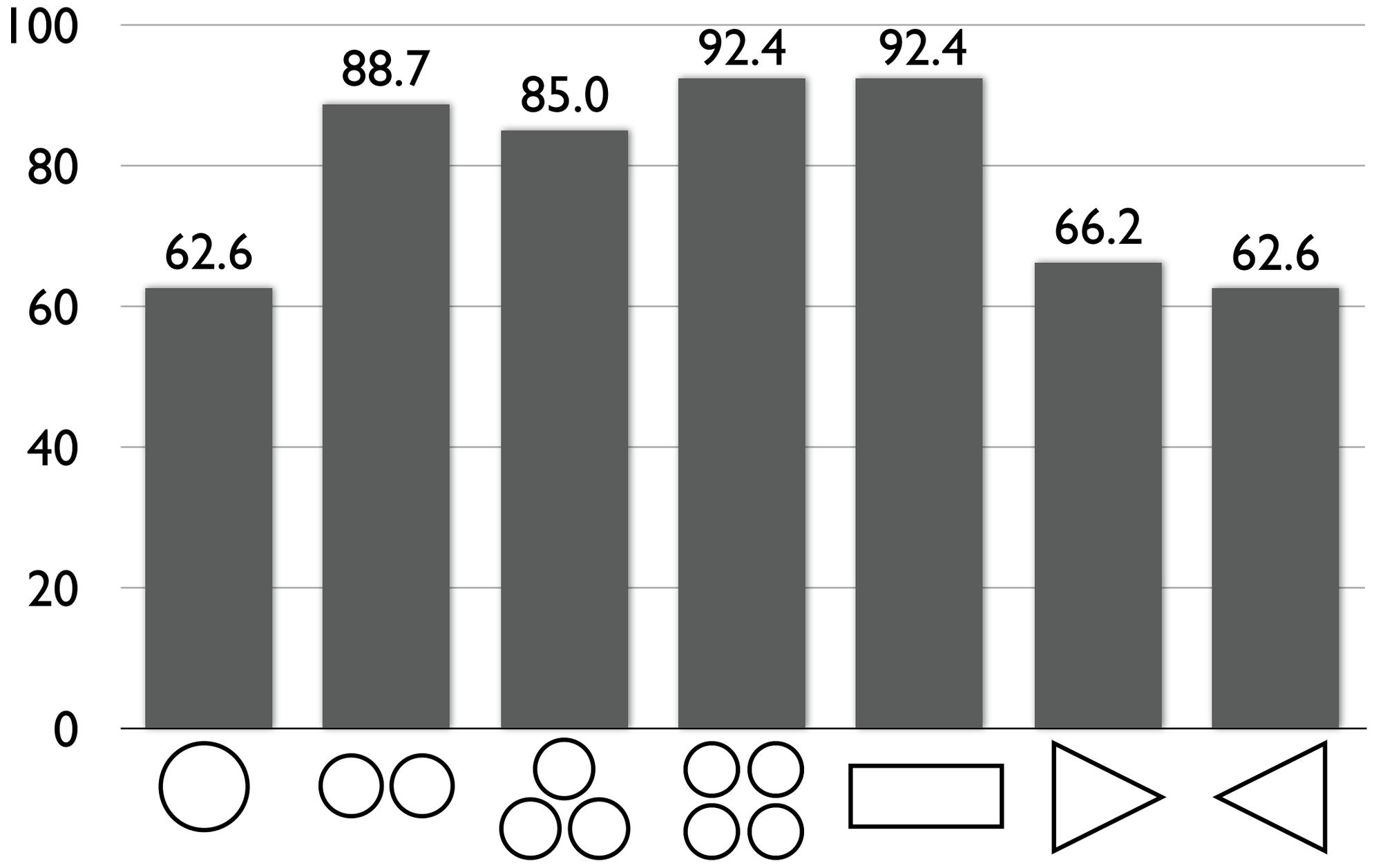



touched fiber
t

match **pattern** against a database of labeled **widget templates**



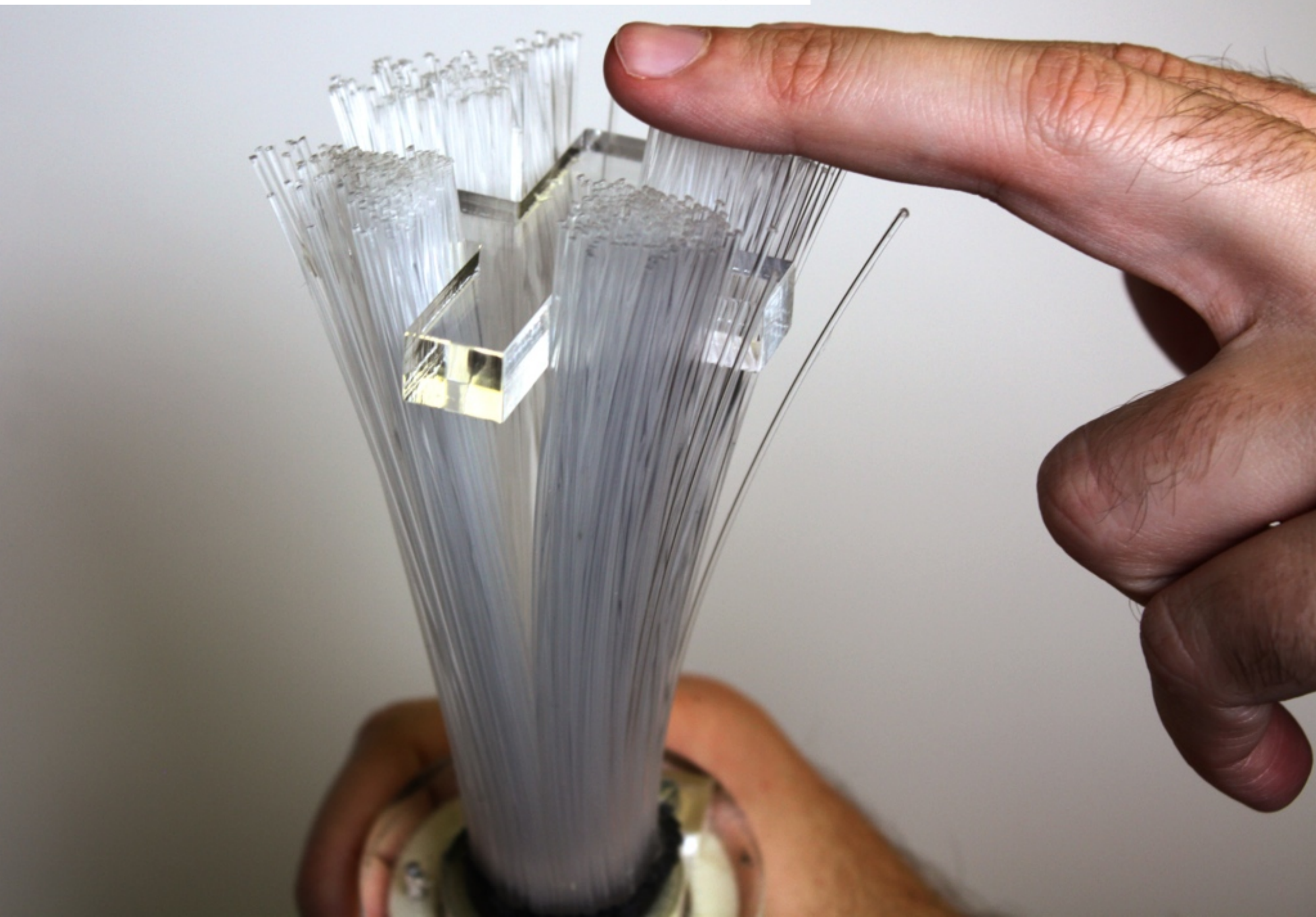
recognition rate of first time use



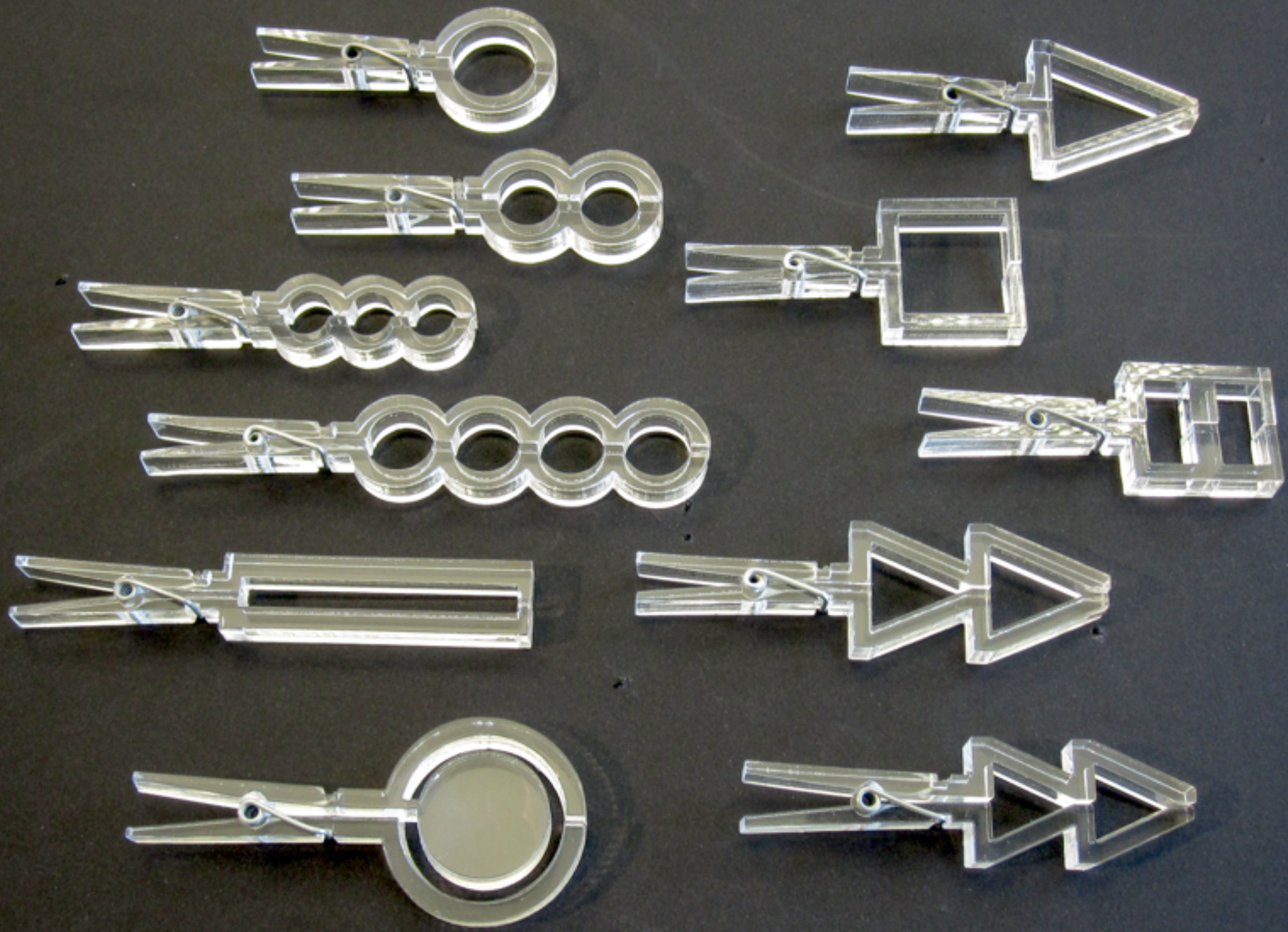
9 participants, 3 repetitions each

Wedges, Clamps and Sieves

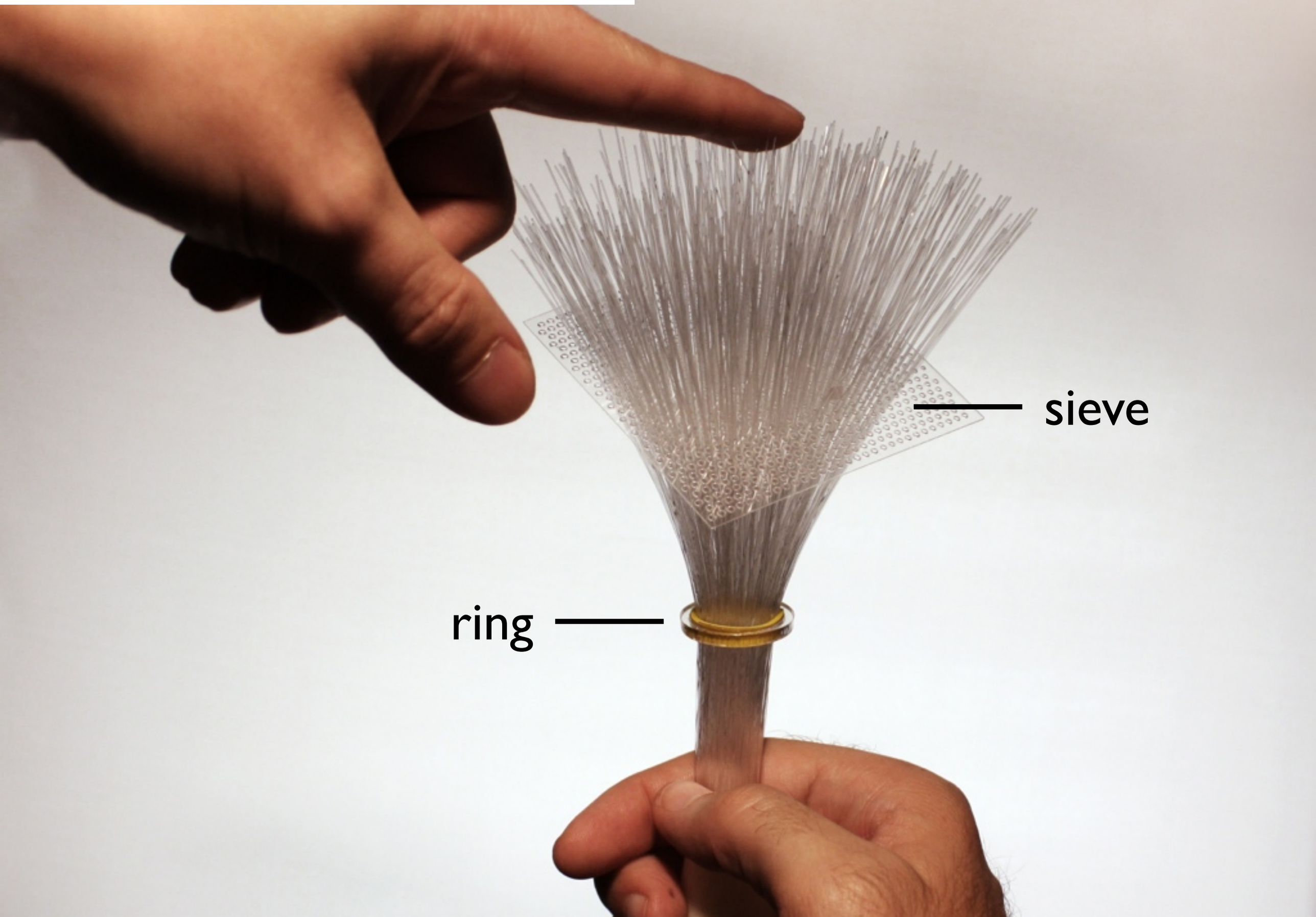
wedges create **multiple** widgets



clamps give widgets **custom shape**



large interaction **surface**



large interaction **surface**

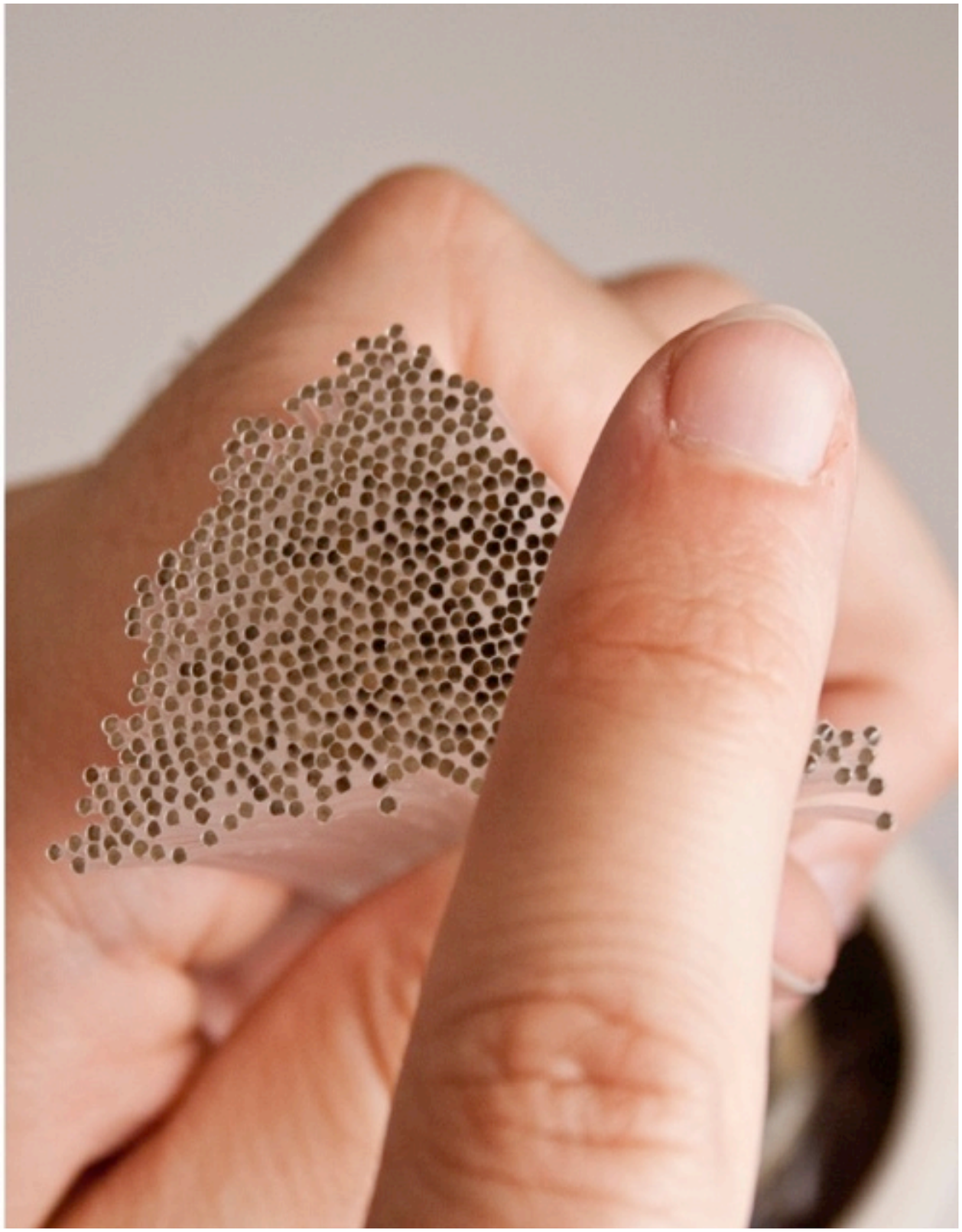
Conclusion

Rock-paper-fibers:

- bring physical **affordance** to **mobile** touch devices
- users **reshape** the touch device itself
- additional expressiveness by using **wedges** and **clamps**

Vision :: touch pads that we can really reconfigure

we think of **rock-paper-fibers** as a reconfigurable **touch pad**



we just started to **bend** devices...

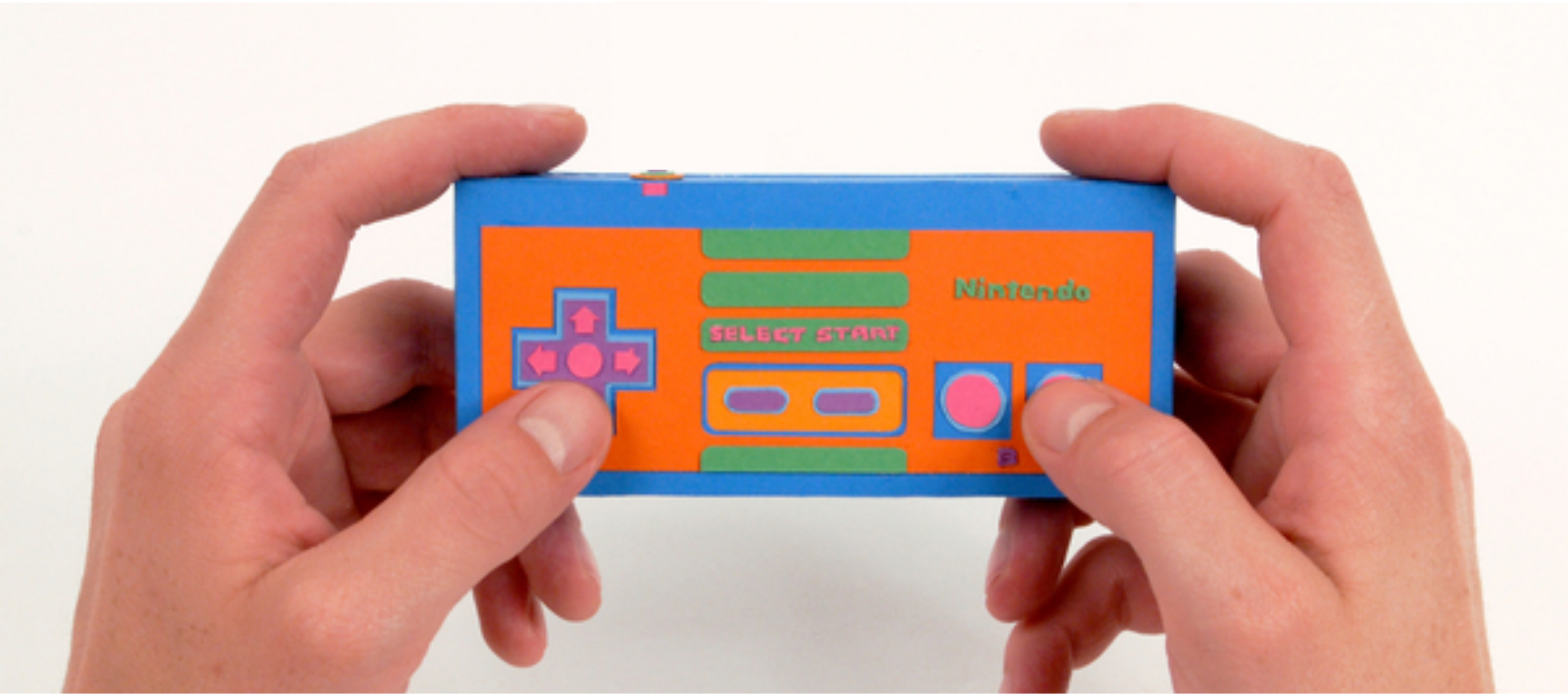
Lahey, B., et al. PaperPhone. CHI '11.

…we have started to **stretch** touch devices...

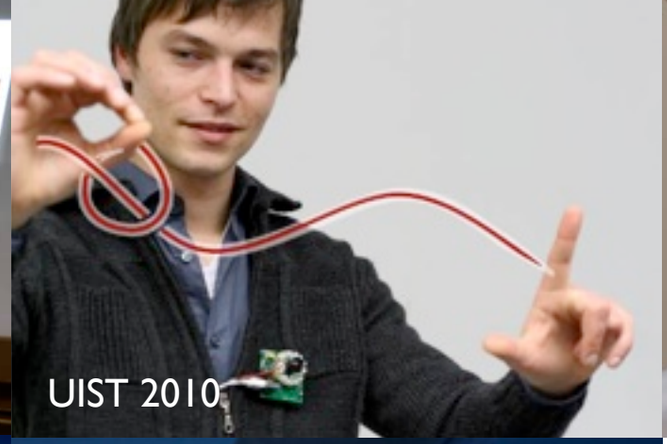
Wimmer, R., and Baudisch, P. Touch using TDR. UIST '11.

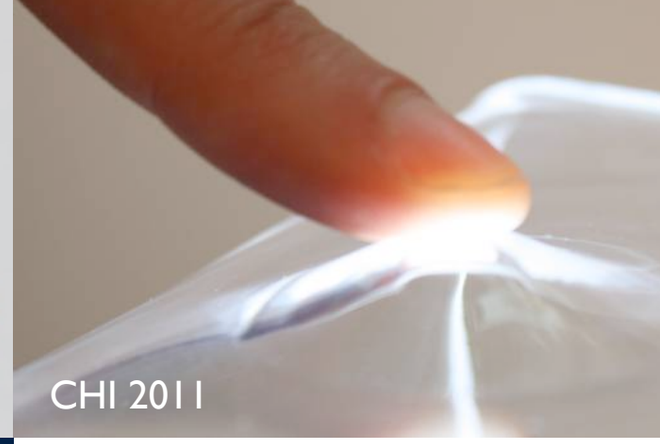
…but this is just the first step

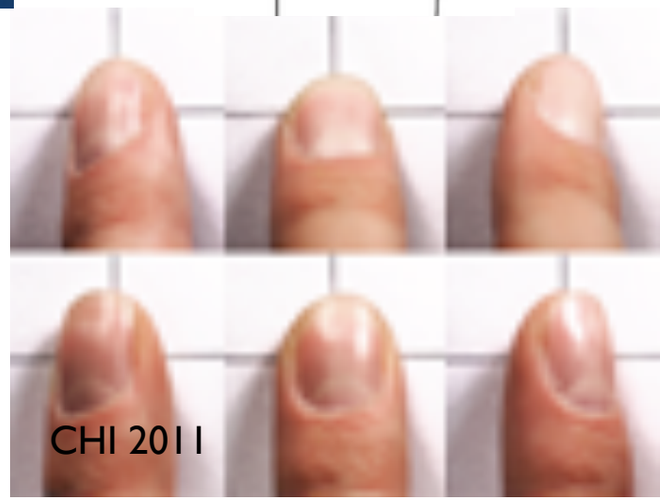
reconfigure the device into whatever it takes to **best support our task at hand**



we think of **rock-paper-fibers as the first step** in this direction







we have one open
PhD/postdoc
position

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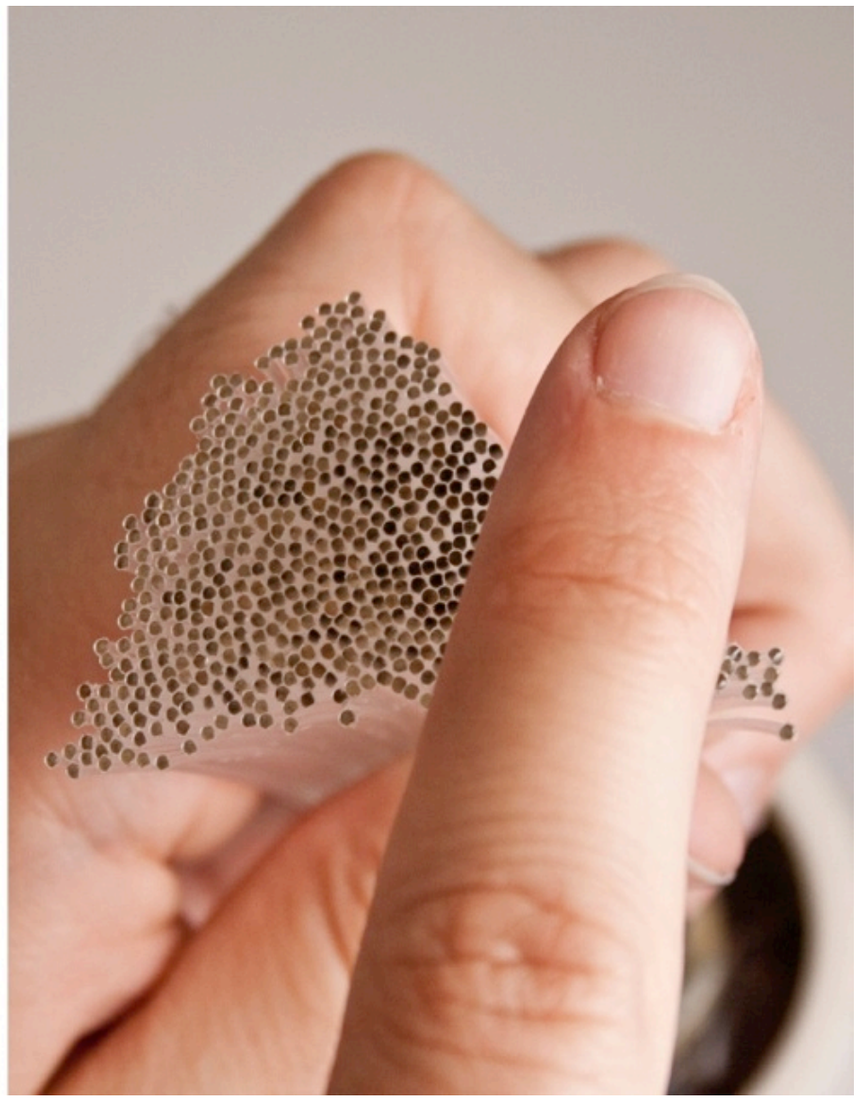

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