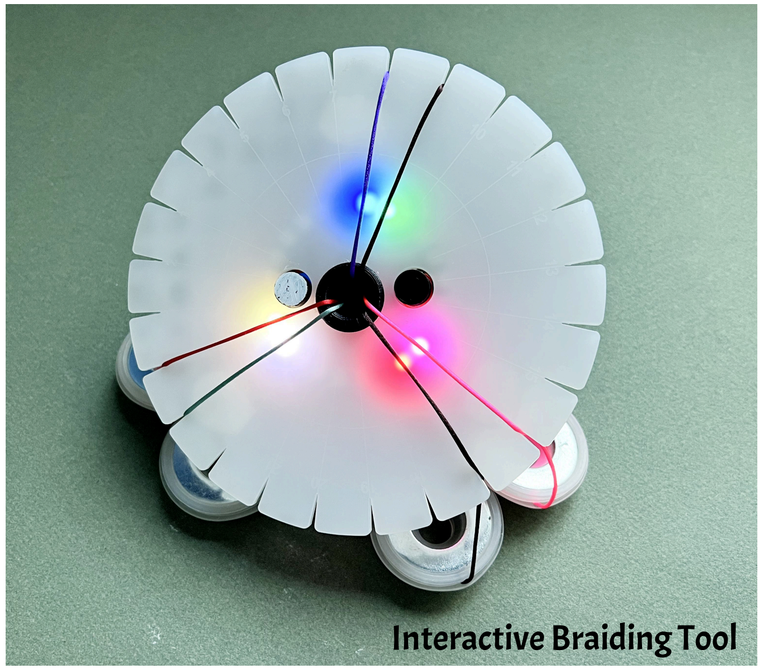
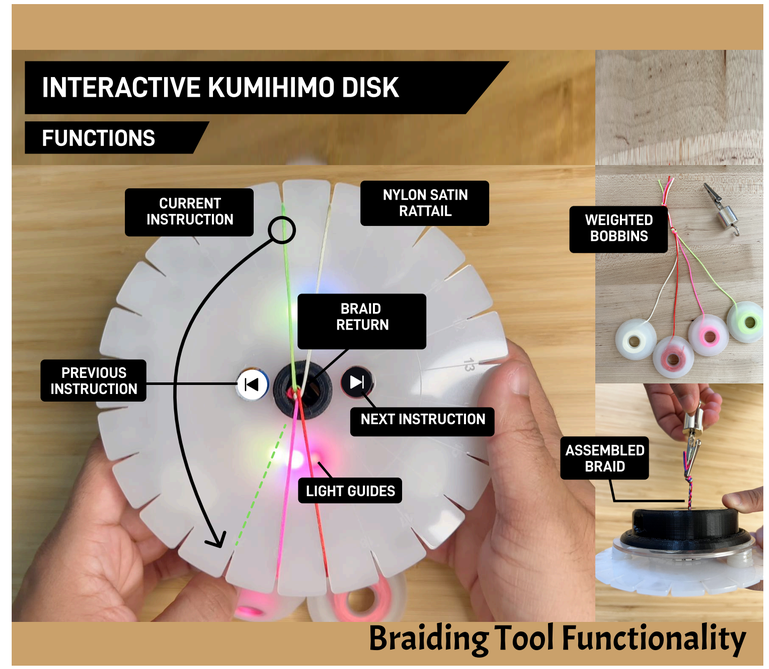
# Interactive Braiding

## Manual Kumihimo braiding tool required skilled users but what about interactive tool?




### TYPES OF BRAIDED FABRIC

A wide range of braided fabrics are available and can not be produced with a single tool

### TOOL THAT INTERACT

We developed a tool that can provide visual feedbacks on how to move strands based on the unique design of the fabrics.

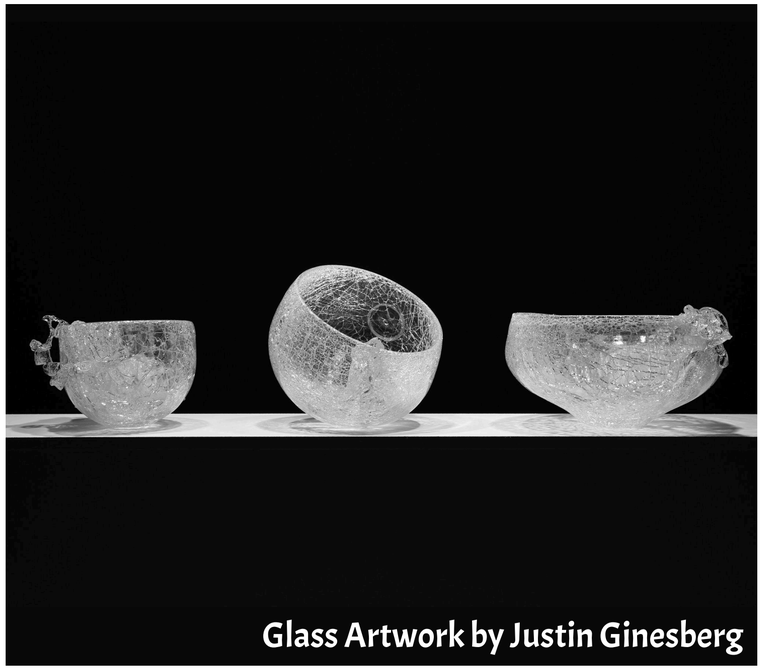
### FEATURES AND CONSTRUCTION

The tools can detect and differentiate how beginners braid and how skilled makers braid by analyzing the movement of the strings and disk during braiding.

**A dataset paper was published based on collecting human body responses. Click here for details.

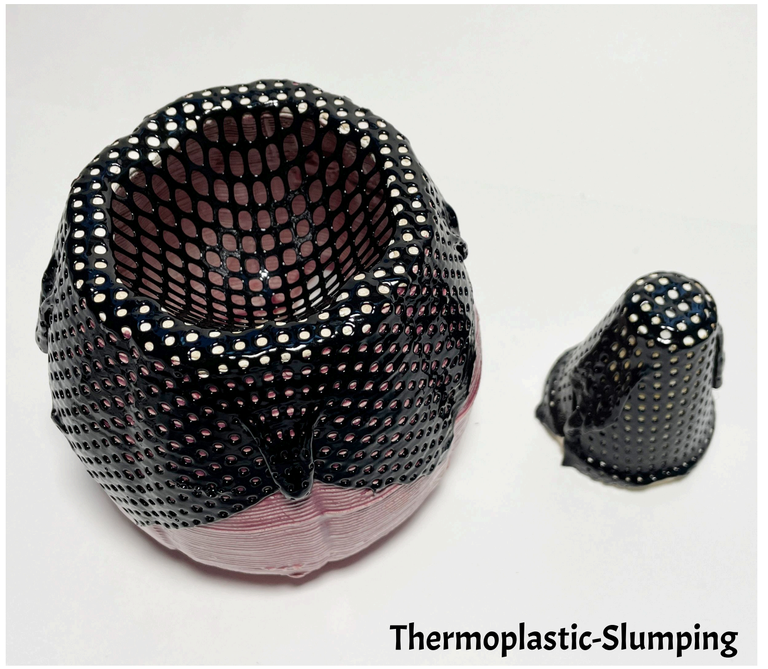
# Thermoplastic Kilnforms

## Can an ontology of materials help us better understand and use materials?



Glass Artwork by Justin Ginesberg

Micro-texturization



Thermoplastic-Slumping

### GLASS ONTOLOGIES

Various terms and techniques exclusive to the glassmaking community often go unnoticed in other fields. Can these techniques be adapted and applied to materials with similar properties, such as those that become flexible when heated?

### CROSS-COMMUNITY ONTOLOGY DEVELOPMENT

We developed an ontology based on glassmaking and cross-referenced it with thermoplastics manufacturing. Subsequently, we applied unique techniques to create artefacts resembling glass, using thermoplastic materials.

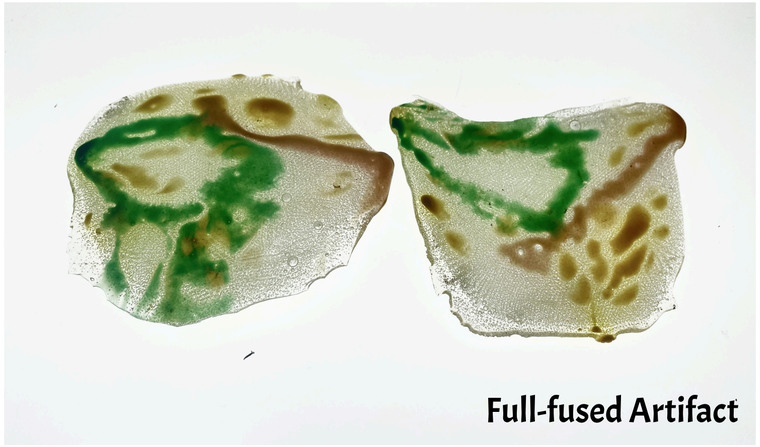
### SHAPE FORMATION

Ontology-guided design enables the creation of unique shapes and innovative designs.

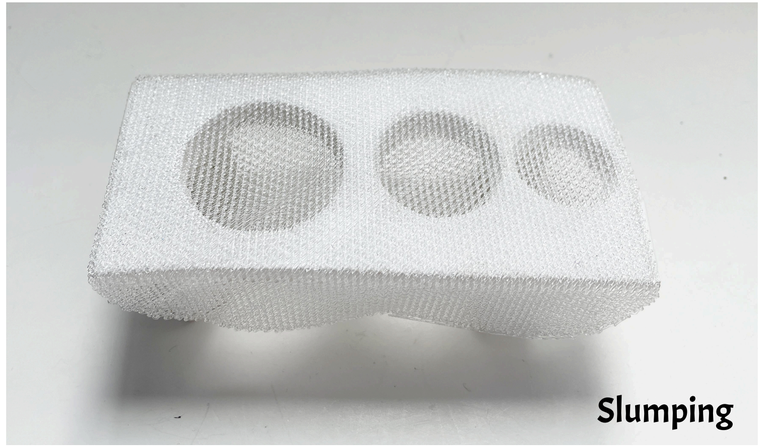
**A ontology-based paper was published in DIS2023. Click here for details.

# What other glass artwork-making techniques can we apply in thermoplastic area from the developed ontology?

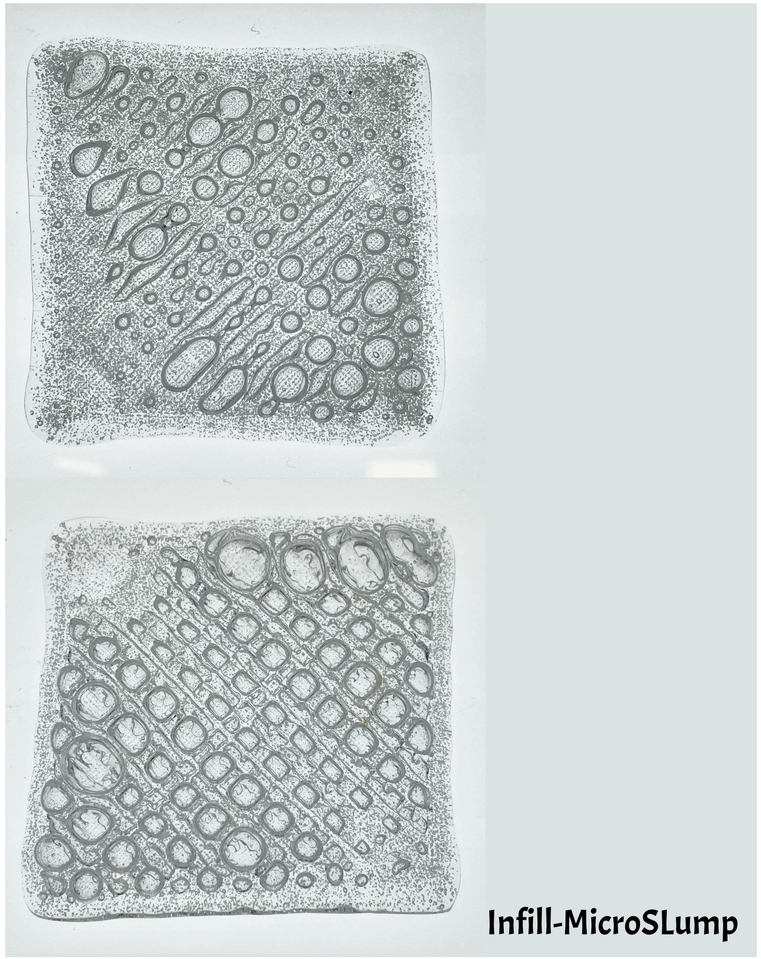
Wittness Cylinder Test



Full-fused Artifact



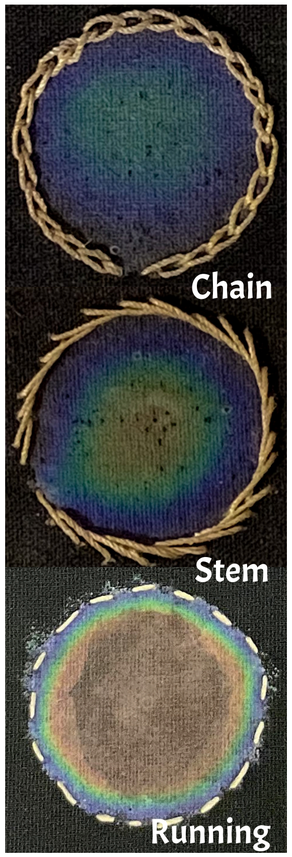
Slumping



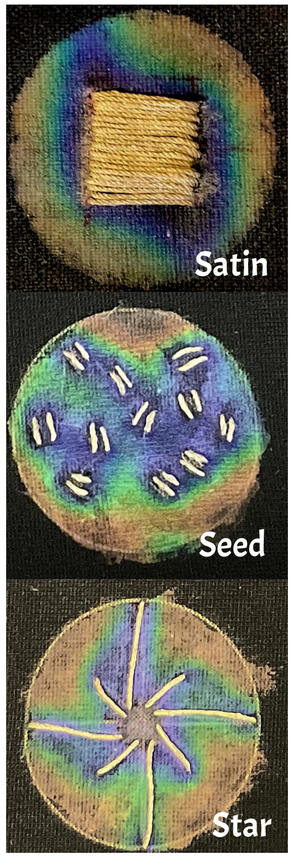
Infill-MicroSLump

# Embr-Hand Embroidered Liquid Crystal Textile Displays

I assisted in the development of flexible textile displays using black-colored or printed fabric, conductive thread, and liquid crystal solution.






**FISH SCALE SIMULATION**

Application of Chain and Cross stitch

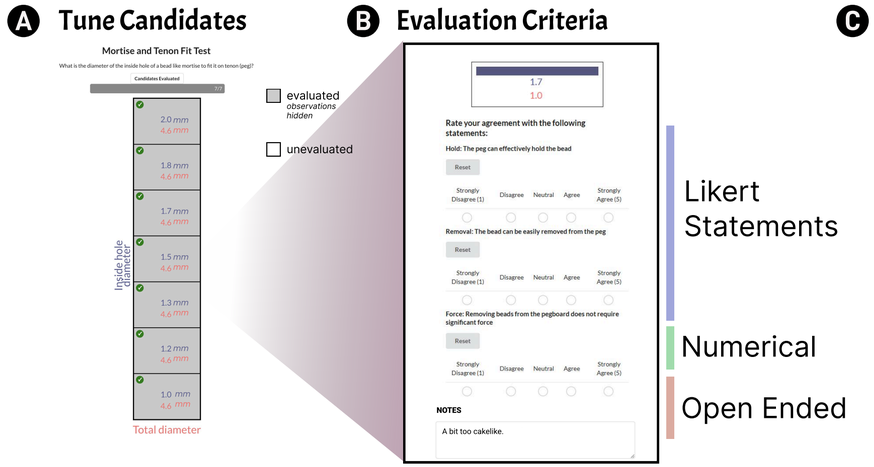
**SIMULATING LEAF**

Application of feather stitch and chain stitch

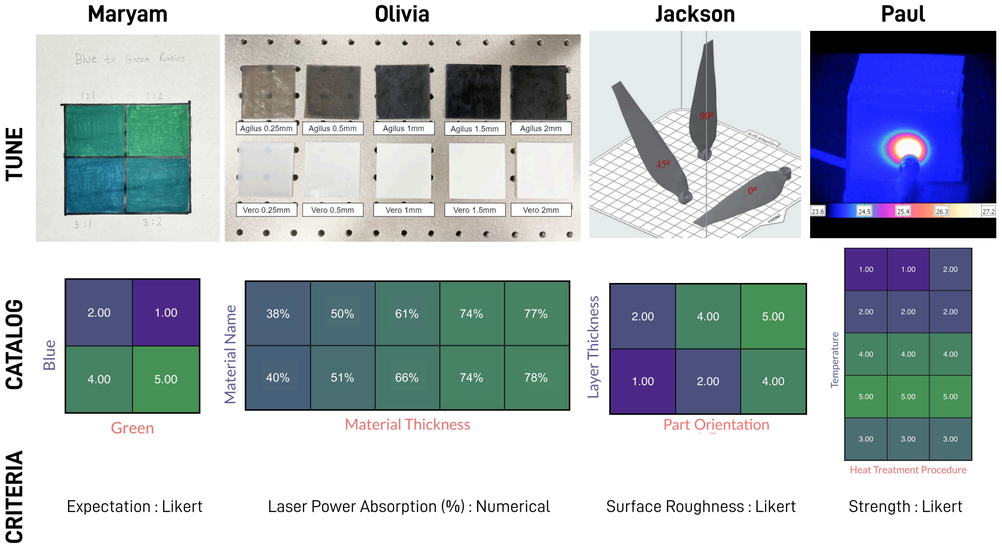
[**A paper was published in CHI 2022 on hand-embroidered liquid crystal textile displays. Click for details.]

# Material Tuning

## Could it be useful to develop a tool that can assist with different types of tuning in HCI communities?




A sample of the proposed prototype of a tool that can assist in the tuning process.




Conceptual framework on the types of tuning that the tool can support.

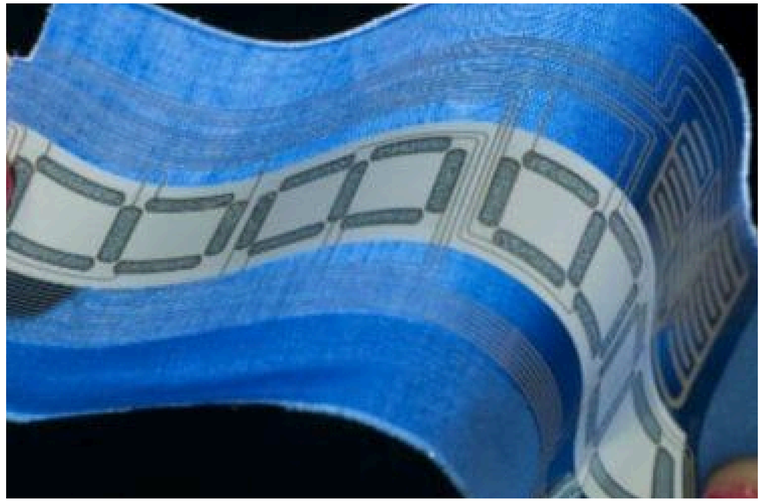
**This is a work in progress. Please send me an email if you are interested in collaborating.

# Weaving in e-textiles (on going)

E-textile development requires a deep understanding of fabrication processes and yarn preparation. Despite attaining a certain level of expertise, makers often struggle to produce complex designs.

## Can this challenge be addressed? If so, how?





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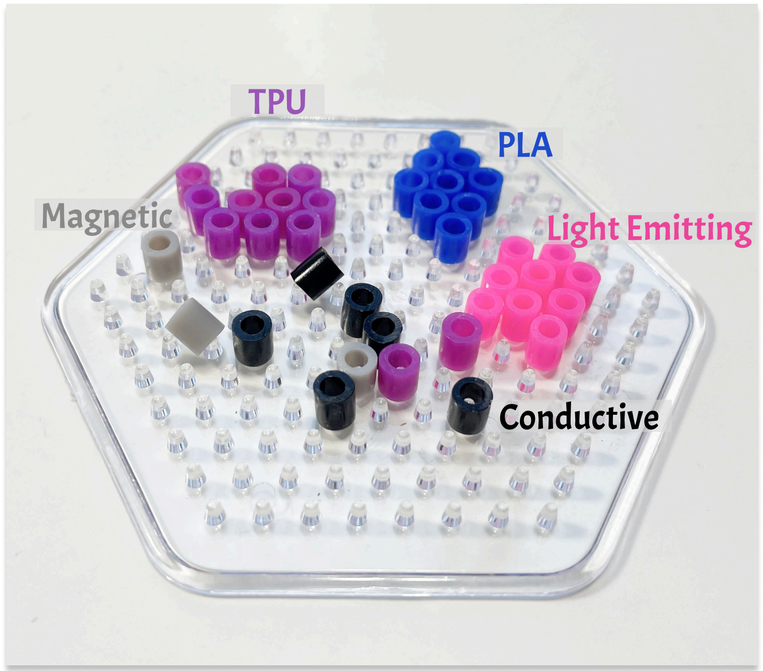
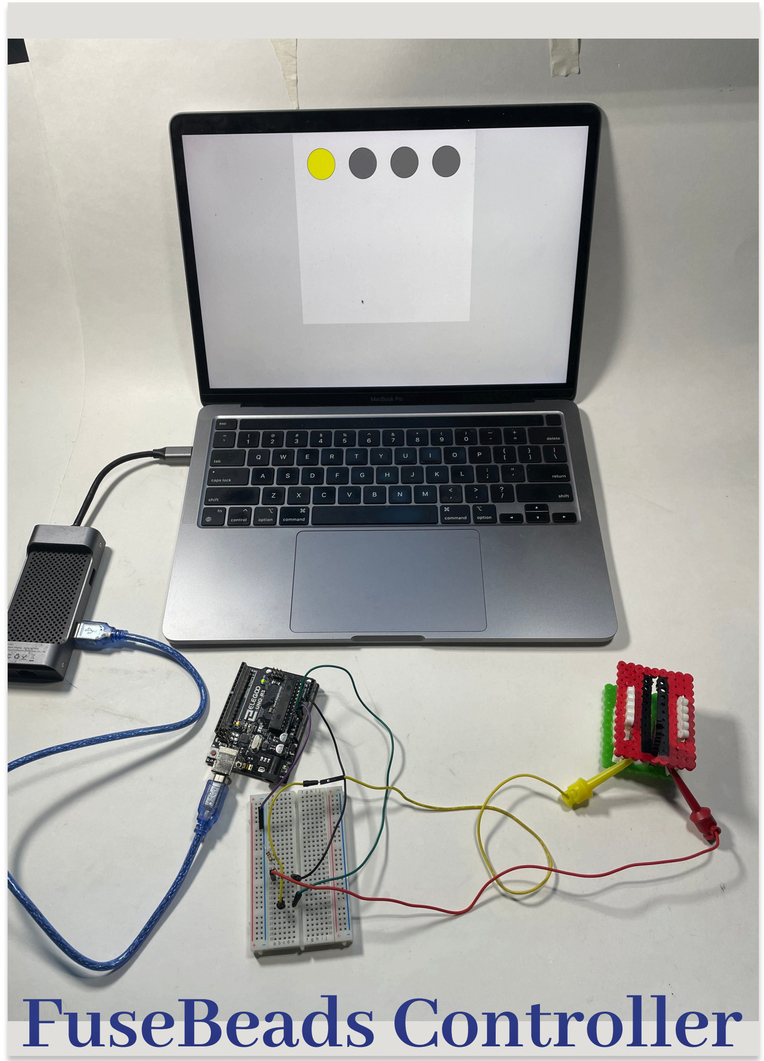
# What types of tangible user interfaces can be developed using fuse beads as a craft material?


### CRAFT MATERIALS IN TANGIBLE COMPUTING

A wide variety of craft materials have been used in tangible computing. I explored crafting techniques to develop different tangible interfaces using multi-material fuse beads.

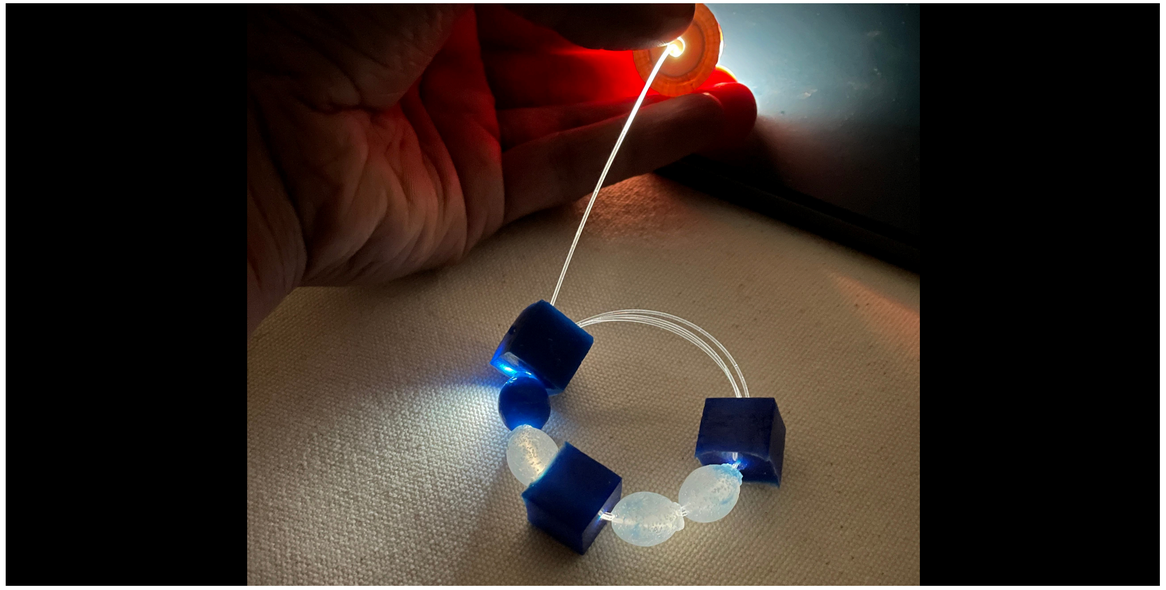
### MULTI-MATERIAL FUSE BEADS

While traditional fuse beads are made from standard plastic materials, we explored the use of fuse beads created from various functional filaments, including water-soluble, conductive, flexible, and light-emitting materials. These were applied to the development of diverse tangible interfaces.

**This is a work in progress. Please send me an email if you are interested in collaborating.

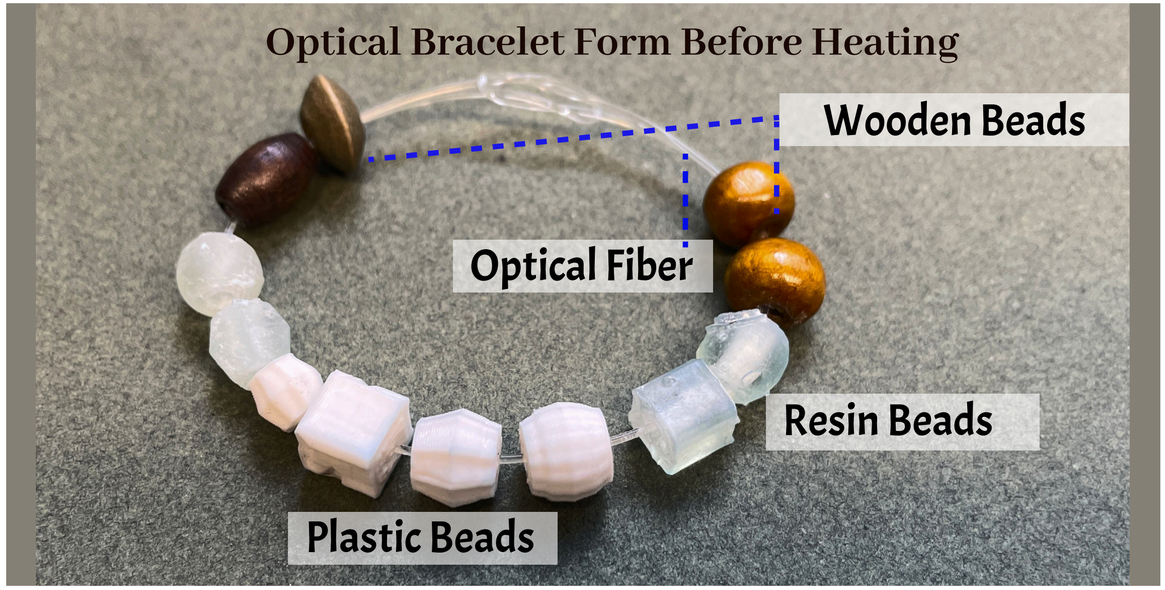
# Exploration of Bead Materials and Their Functionalities

1. What types of materials can be used to create fuse beads? Can these materials enable interactive features?
2. Beyond ornamentation, in what other areas can fuse beads be effectively employed?



## BEADS FROM SILICONE

Silicone beads are soft, provide excellent insulation, and possess remarkable optical properties. Could they be integrated into wearable composites by combining them with various textile fabrics?




## EXPLORING TEXTURES AND FORMS

I investigated how various material combinations, such as flexible, conductive, water-soluble, and optical filaments, can create beads with diverse textures, shapes, and functionalities.

**This is a work in progress. Please send me an email if you are interested in collaborating.