

# Axisymmetric Shape-Change's Purposes and Allure for Ambient Display: 16 Potential Use Cases and a Two-Month Preliminary Study on Daily Notifications



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### **AXISYMMETRIC SHAPE-CHANGE FOR AMBIENT DISPLAY**

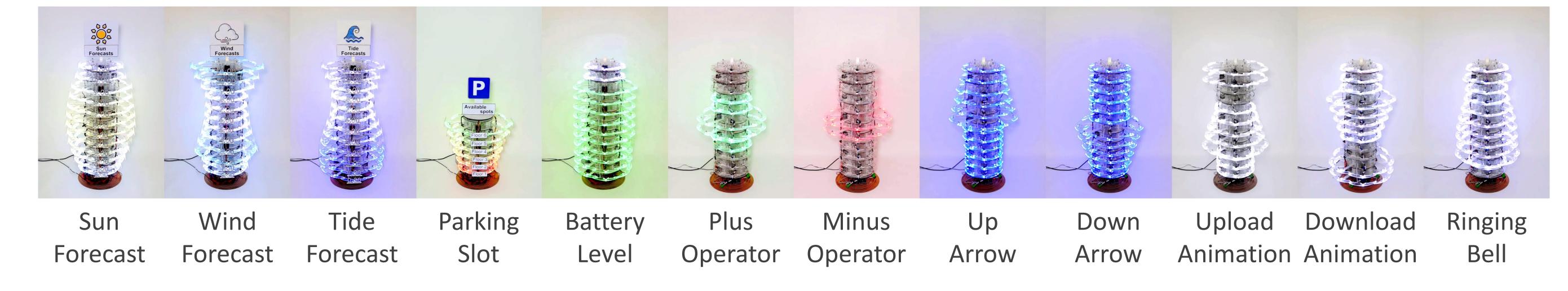
CairnFORM [Daniel et al., TEI'19] is a shape-changing display designed as a stack of expandable illuminated rings: it enables axisymmetric shape-change (e.g., it can morph from a cylindrical shape to a conical shape).



### POTENTIAL APPLICATION PURPOSES

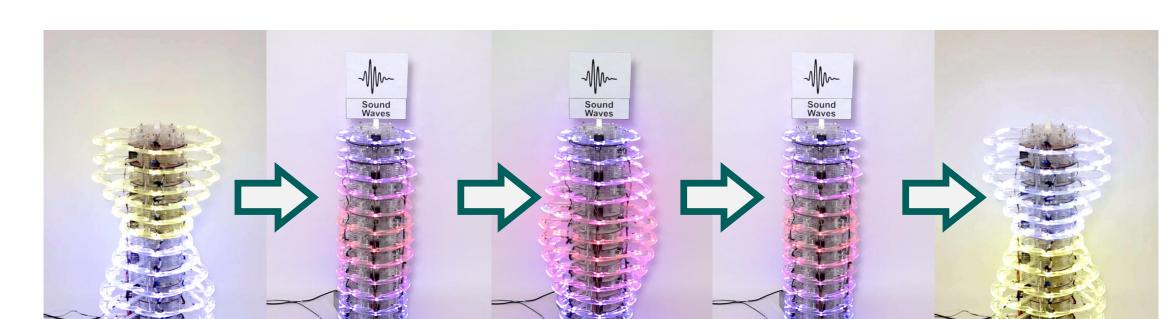
We propose 16 new use cases for axisymmetric shape displays, for four purposes [Alexander et al., CHI'18].

### **COMMUNICATE INFORMATION**



### **SIMULATE OBJECTS**

### **SYMBOLIC AND HEDONIC PURPOSES**



**ADAPTIVE AFFORDANCE** 

Light Hourglass Hanoï

Light Hourglass
Bulb

Hanoï Towers

13H

12H 11H

Welcome Christmas Sound Waves

Champagne Christmas Soundwave fountain Tree Sculpture

Home Assistant
« Brian is cooking and asks for a 10-minute timer.
While he is waiting, he asks for his favorite music. »

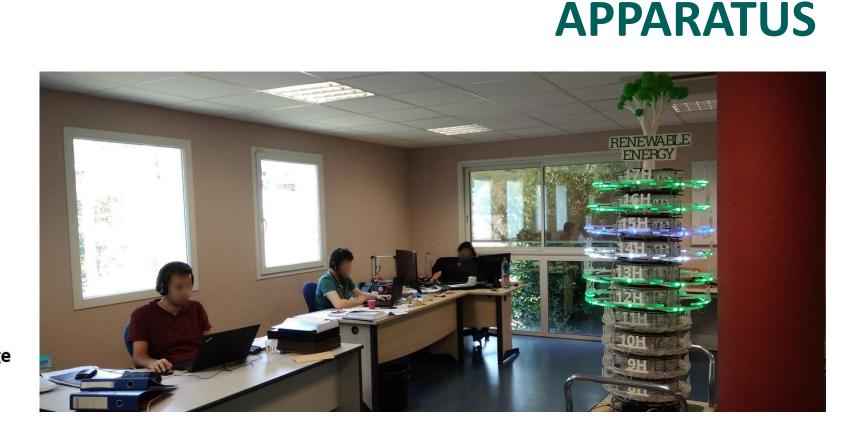
### PRELIMINARY TWO-MONTH FIELD STUDY



Flat Display in office 1
3 participants for two months

### Example for a day with two forecasted variations of local renewable energy production 16H Incoming peak hour 13H first variation second variation 12H 12H in progress notification 11H 11H **Current hour Previous hours** 10H whiten proportionally to the deepest battery charge performed by participants 11h00

Both displays show a vertical histogram visualizing 10-hour forecasts of local renewable energy production



Axisymmetric Shape Display in office 2
3 participants for two months

### SHIFTING LAPTOP BATTERY CHARGE



If battery level > 50% before a peak hour then unplug laptop



If battery level < 50% before a peak hour then plug laptop without battery



If peak hour
then plug laptop

# RESULTS 3 2 1 0 CairnFORMbegin CairnSCREENbegin CairnSCREENbegin CairnSCREENafter CairnSCREENafter 7 Qpragmatic Qhedonic

# Axisymmetric Shape Display is as pragmatic as Flat Display

Both displays helped participants to charge laptop batteries more often and deeper during peak hours.

## Axisymmetric Shape Display is more hedonic than Flat Display

Participants stated that axisymmetric shape-change is still fascinating after two months.









