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Exploring 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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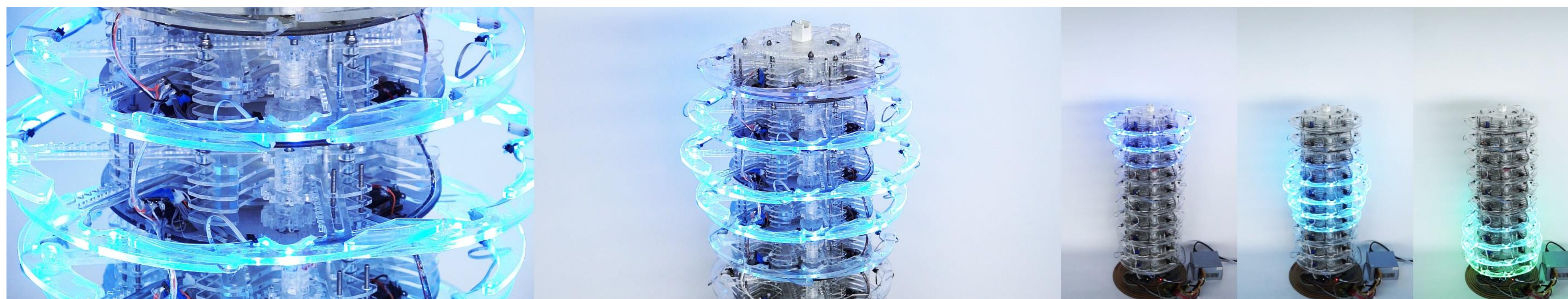
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AXISYMMETRIC SHAPE-CHANGE FOR AMBIENT DISPLAY

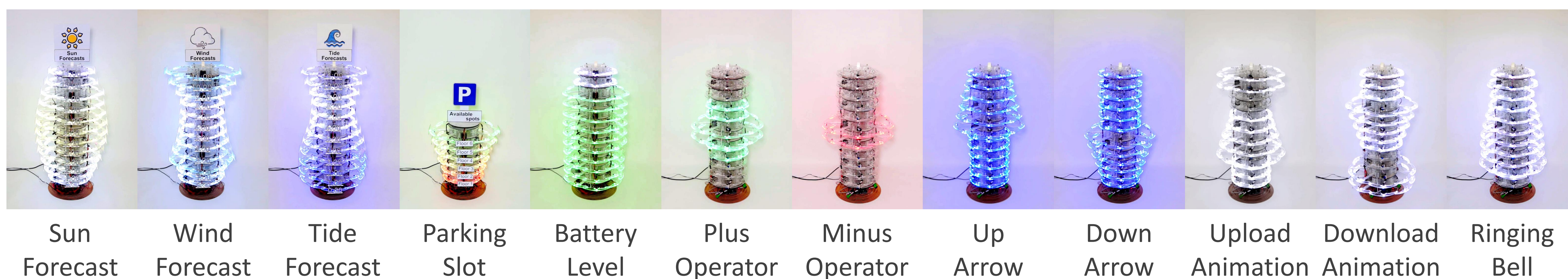
CairnFORM [Daniel et al., TEI'19] is a shape-changing display designed as a stack of expandable illuminated rings: it enables axisymmetric shape-change (e.g., it can morph from a cylindrical shape to a conical shape).



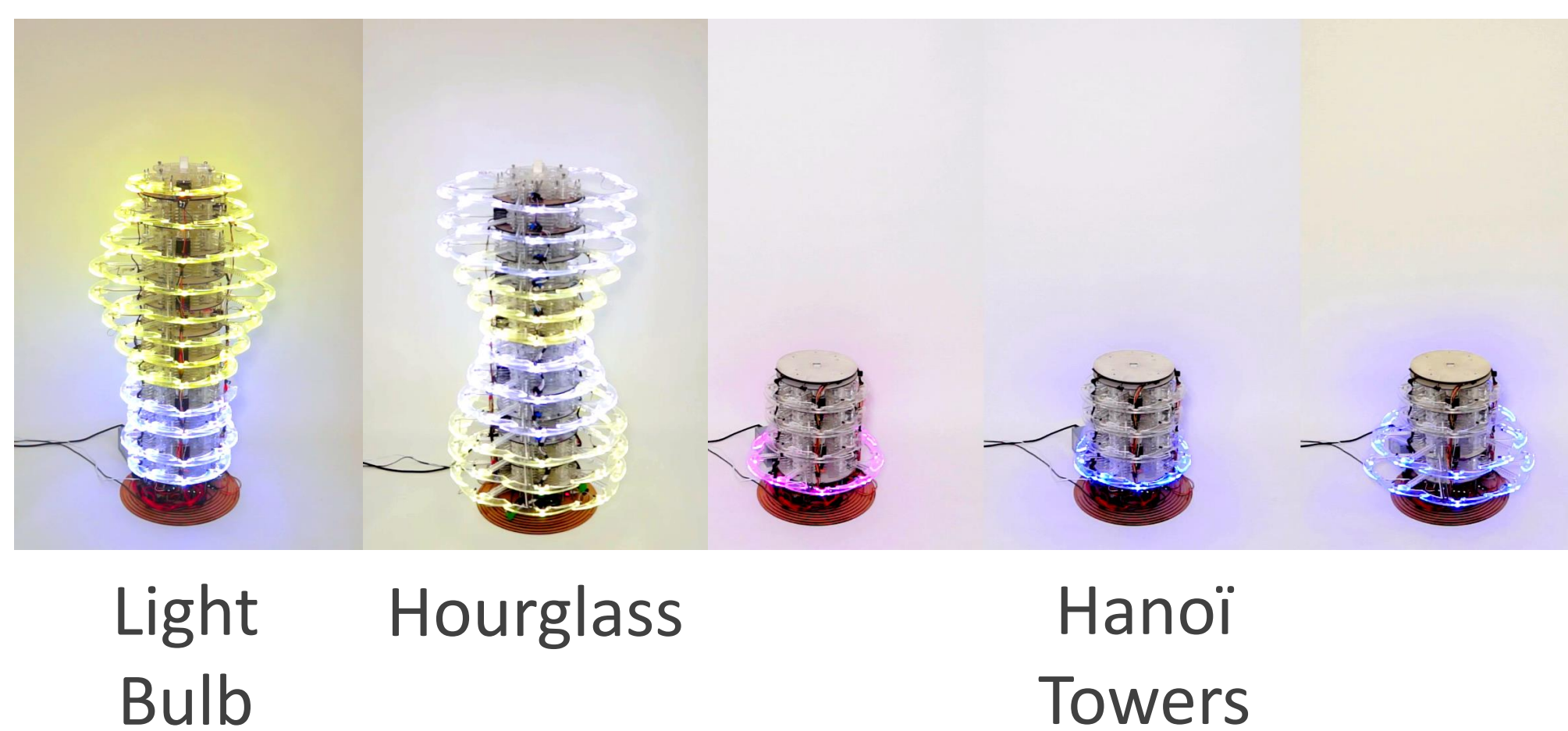
POTENTIAL APPLICATION PURPOSES

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

COMMUNICATE INFORMATION



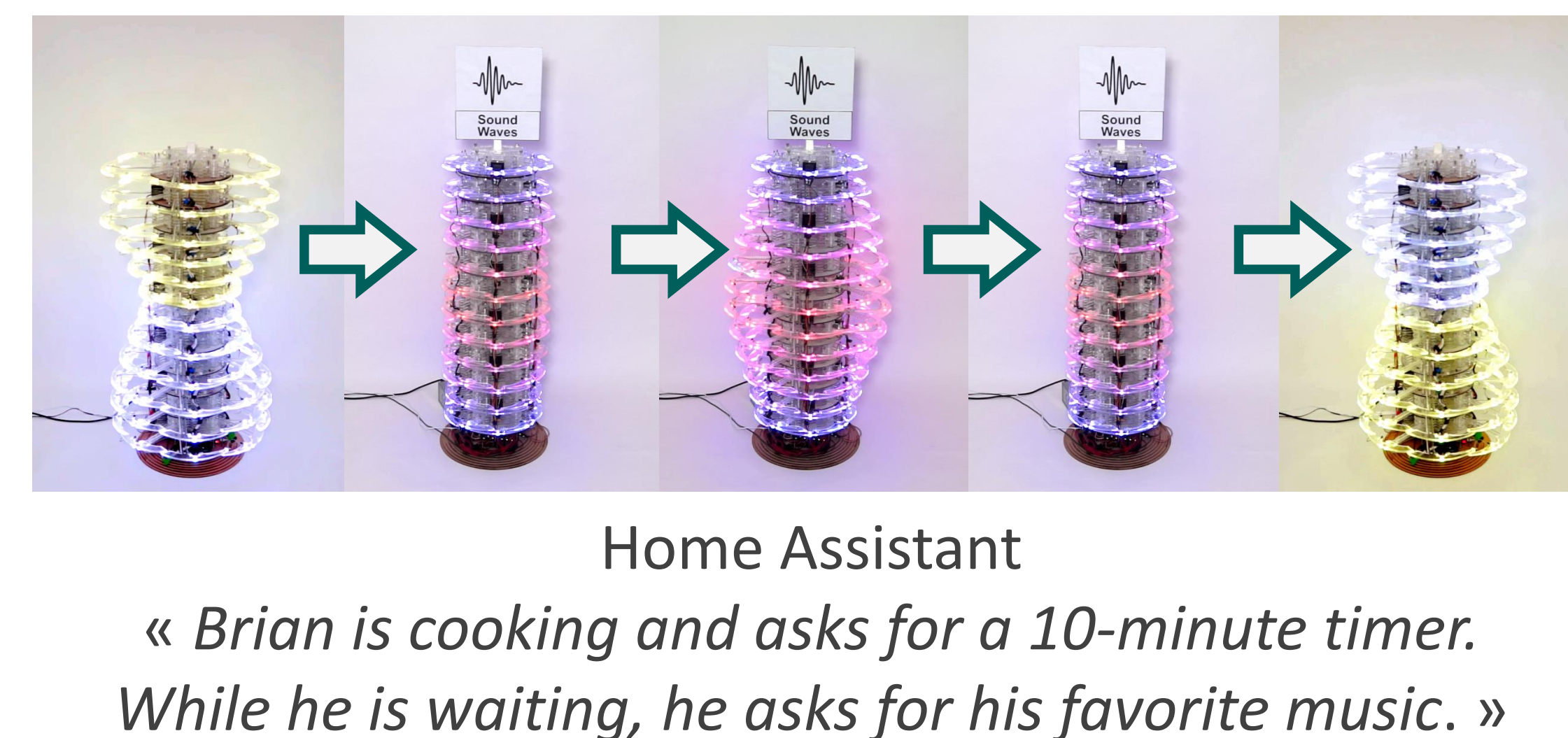
SIMULATE OBJECTS



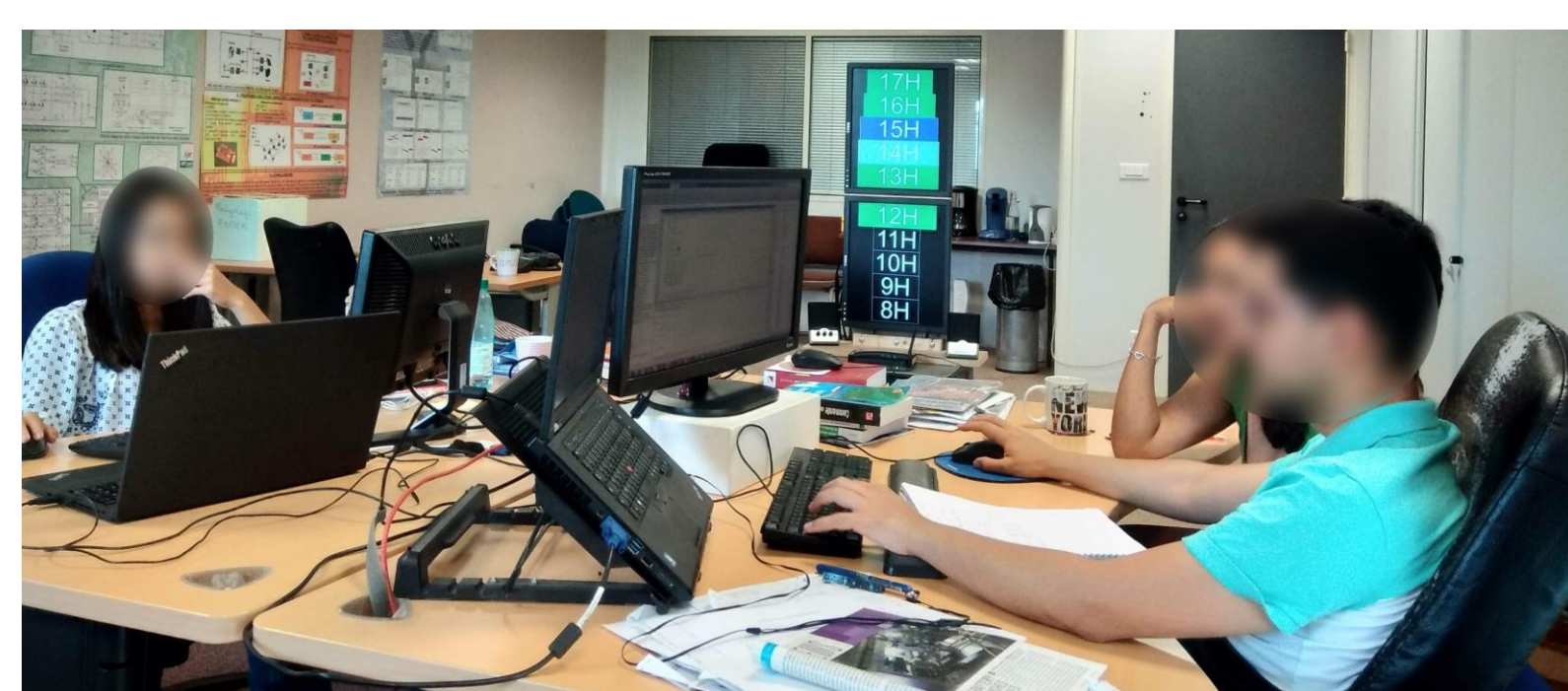
SYMBOLIC AND HEDONIC PURPOSES



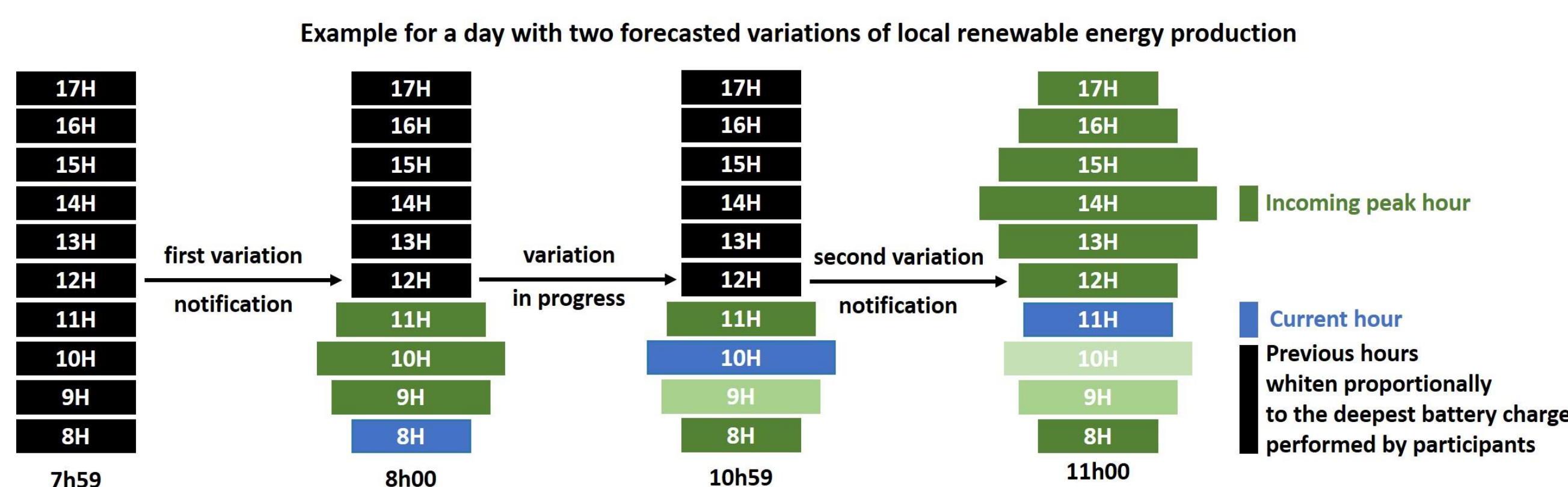
ADAPTIVE AFFORDANCE



PRELIMINARY TWO-MONTH FIELD STUDY

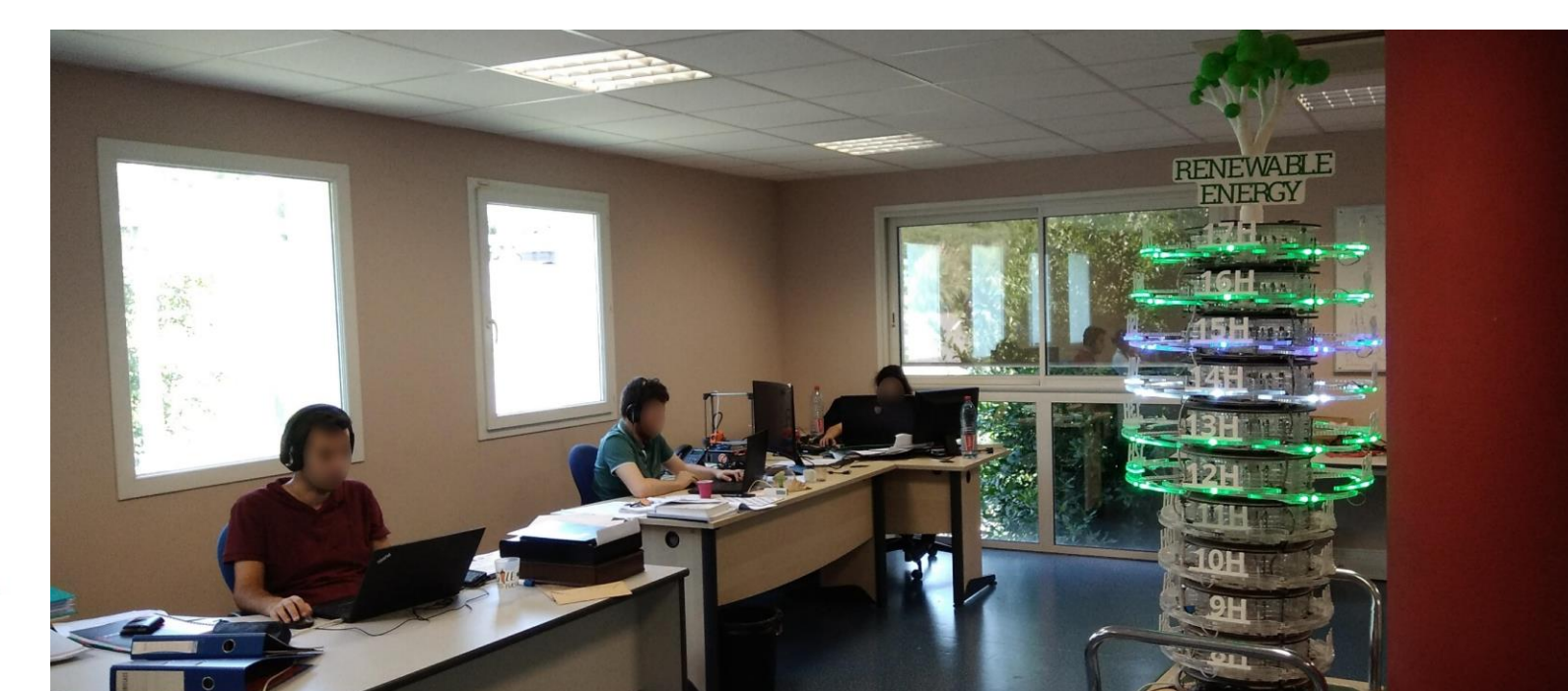


Flat Display in office 1
3 participants for two months



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

APPARATUS

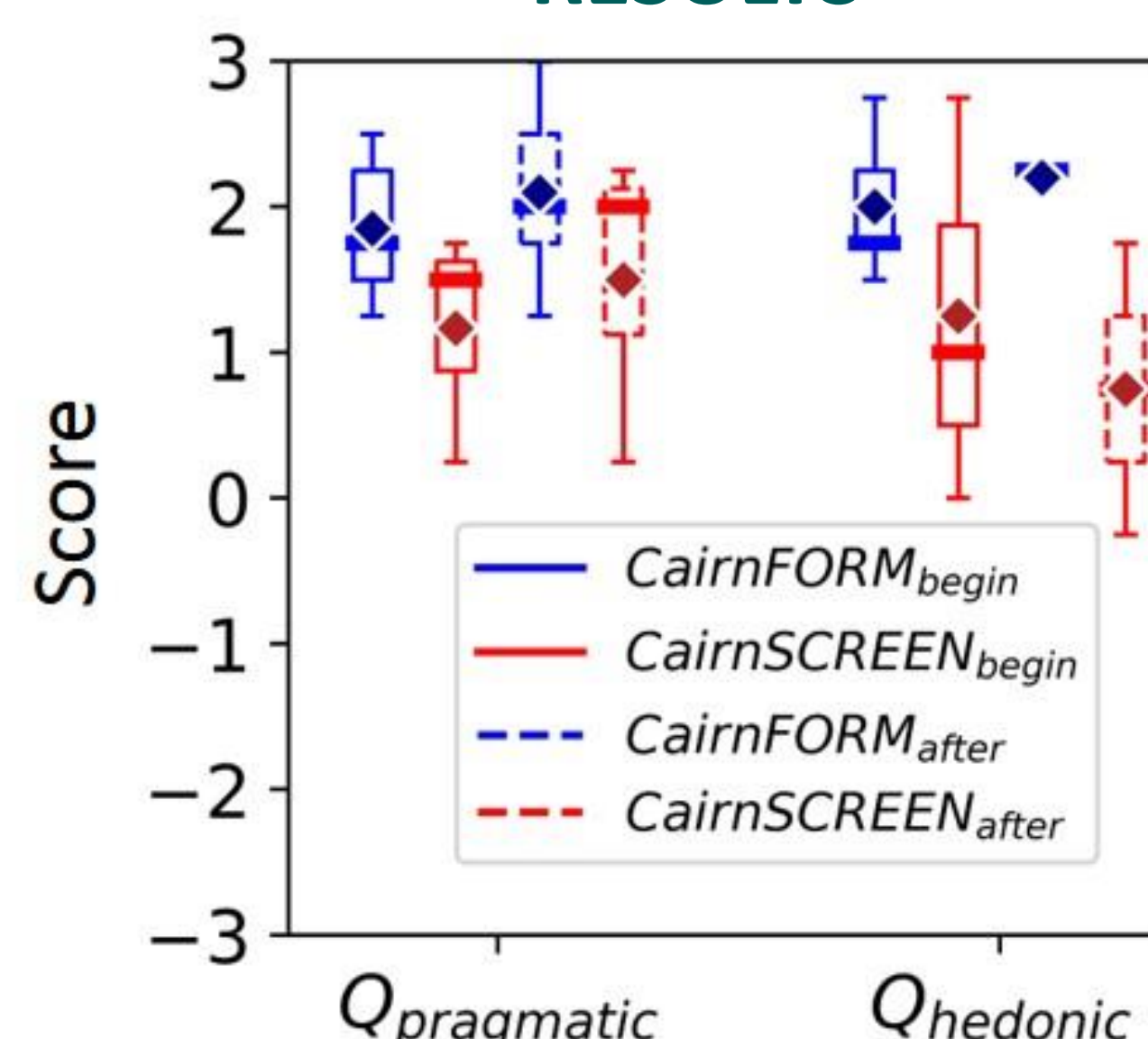


Axisymmetric Shape Display in office 2
3 participants for two months

SHIFTING LAPTOP BATTERY CHARGE

- 1 If battery level > 50% before a peak hour then unplug laptop
- 2 If battery level < 50% before a peak hour then plug laptop without battery
- 3 If peak hour then plug laptop

RESULTS



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.