Visualizing Excitement of Individuals and Groups

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AGT international
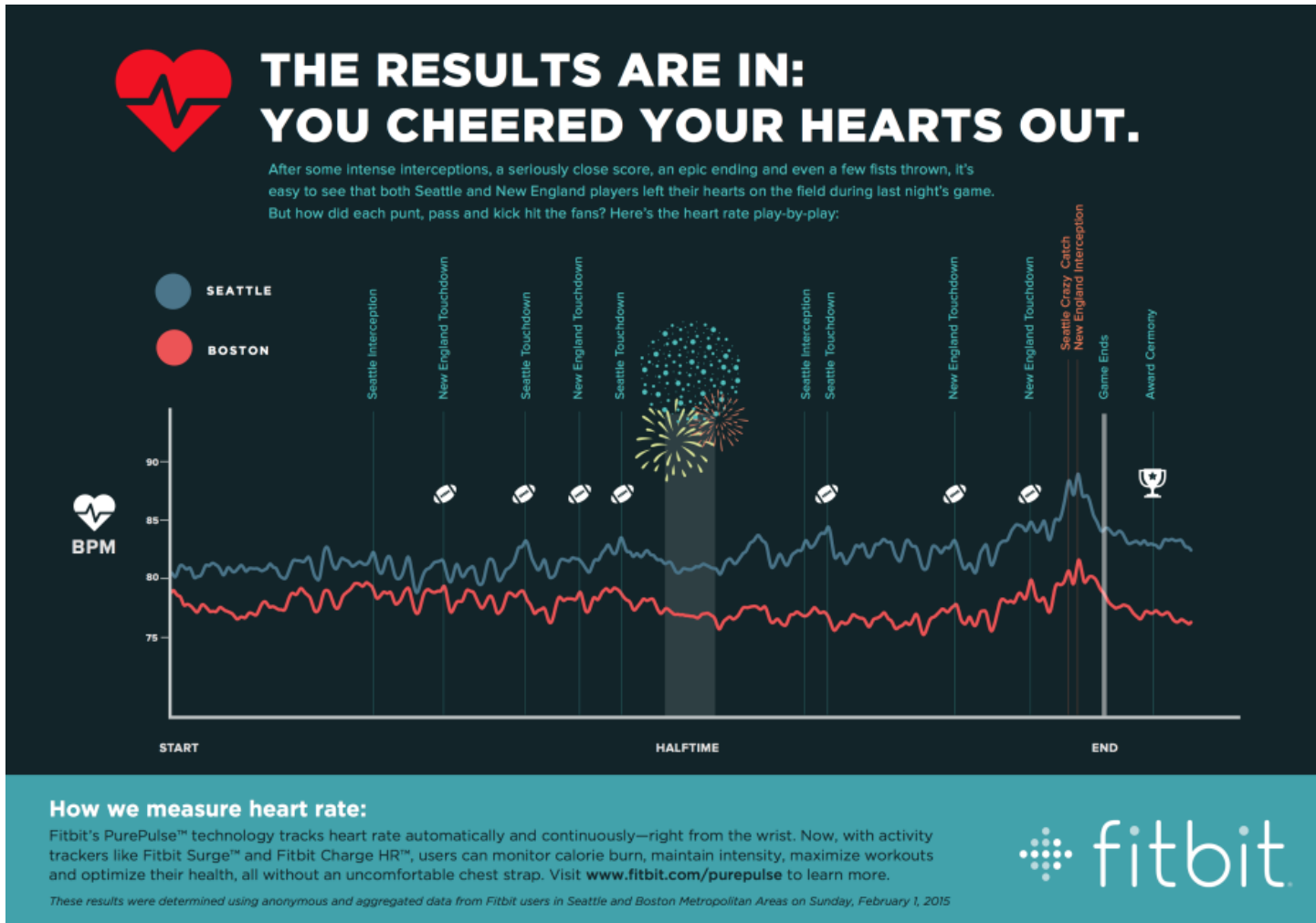
Motivation

Motivation

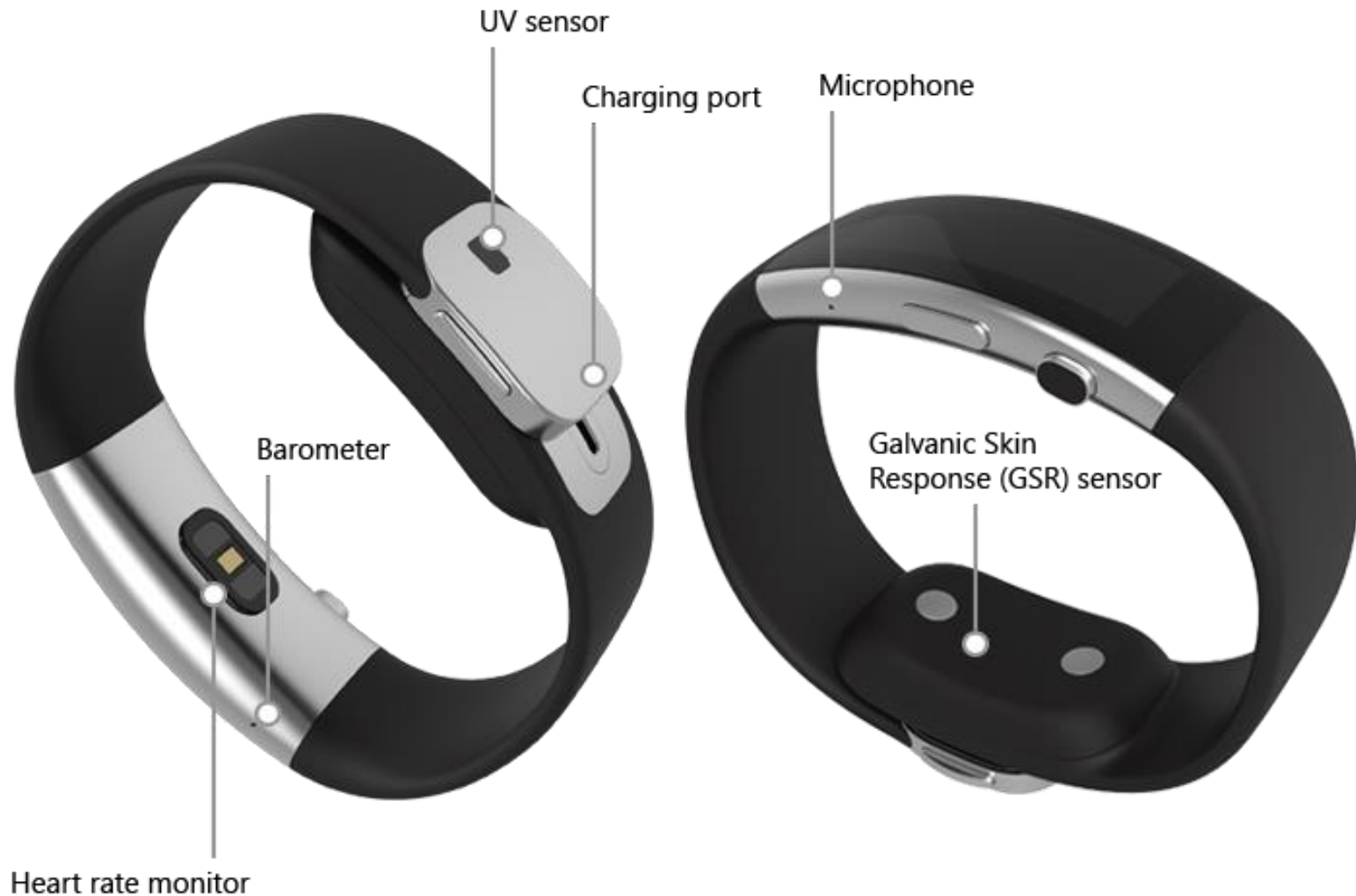http://goo.gl/FjppeB
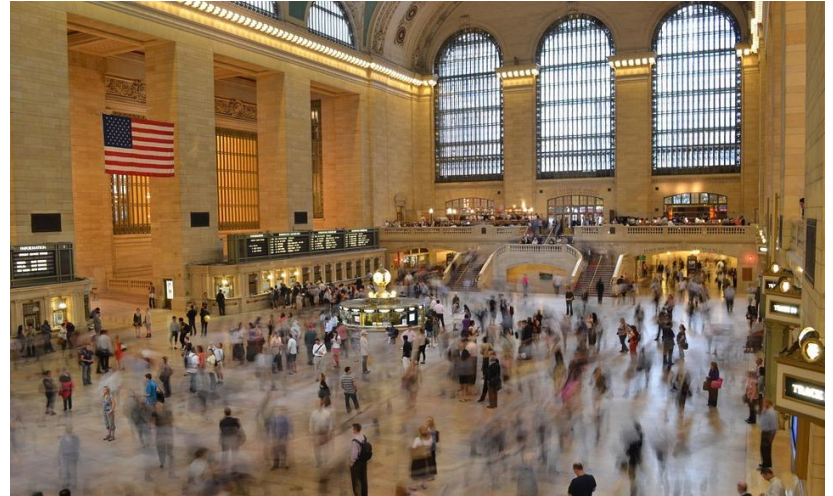
Motivation

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Goal:

- capture and represent user excitement in the context of emotional self-awareness and group-level awareness

Data Acquisition and Processing

Data Acquisition and Processing

Recorded galvanic skin response (GSR) and accelerometer (ACC) values for several people

Activities: watching a movie, an opera, and going to a museum

Participants: 3 to 4 at a time
Sessions: 20-60min

Synthetic datasets of up to 15 people

Data Acquisition and Processing

MS Band 2 → **Bluetooth** → Android phone → **WiFi** → Secured Database

ACC values – sampled to synchronize them with GSR values

GSR values – de-trended and normalized to detect the extracted normal and stressed states

GSR issues: poor contact & tight fit

Design Considerations

Visualization tasks:

- Convey current excitement values for each user in a group
- Offer a short-term temporal overview of excitement levels
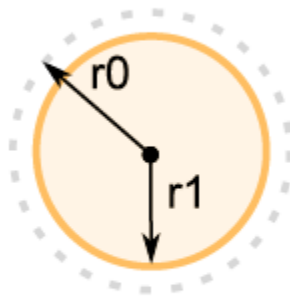- Highlight the overall group excitement at a given moment

Focus points:

- Individual and group level excitement

Excitement Visualization
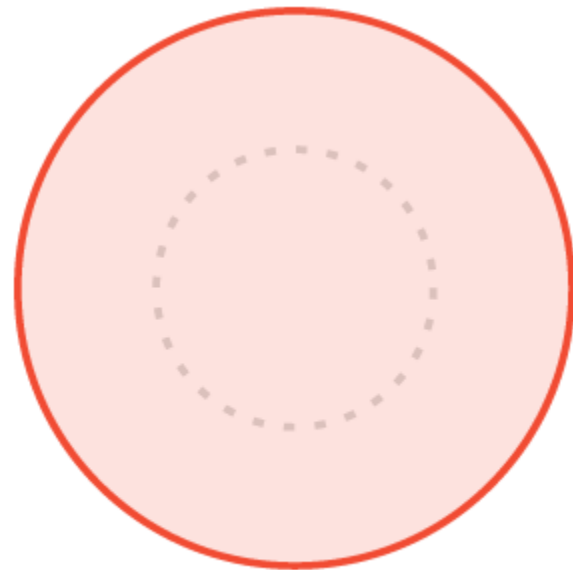
Animated glyphs representing each user's excitement level
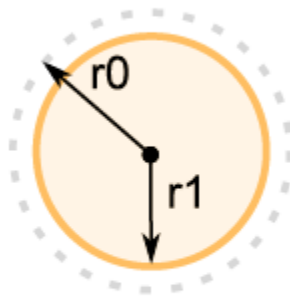
Components: rings and trails

Excitement Visualization
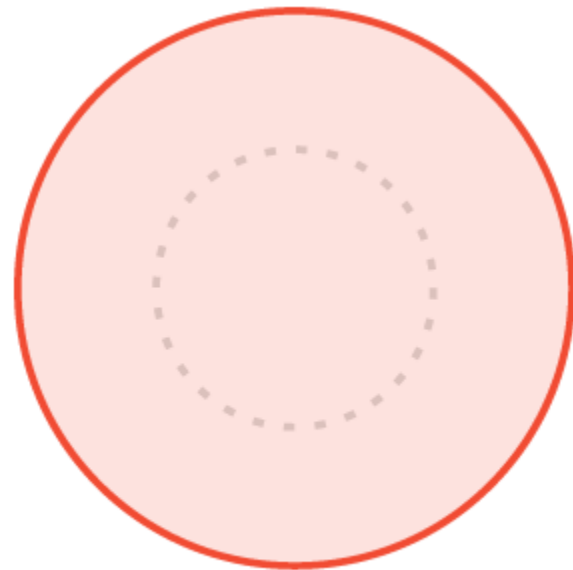
Experienced (GSR) vs. manifested (ACC) excitement
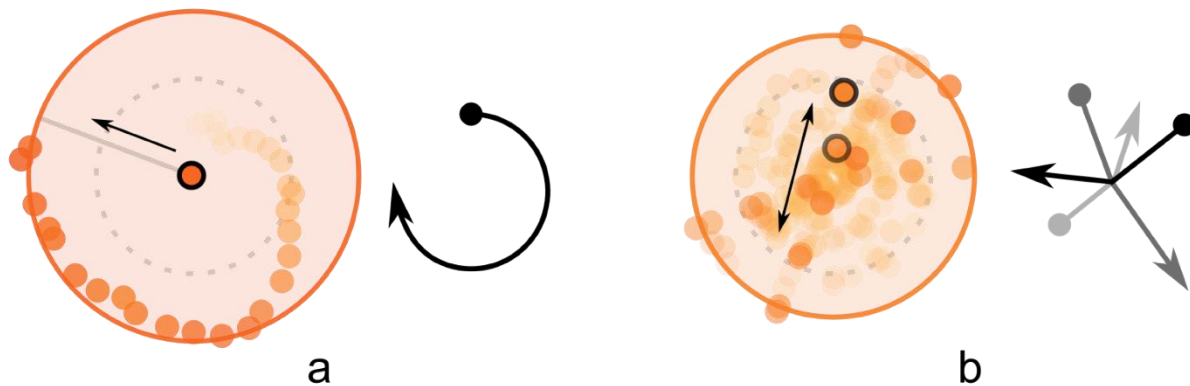
Note: Manifested excitement requires experienced

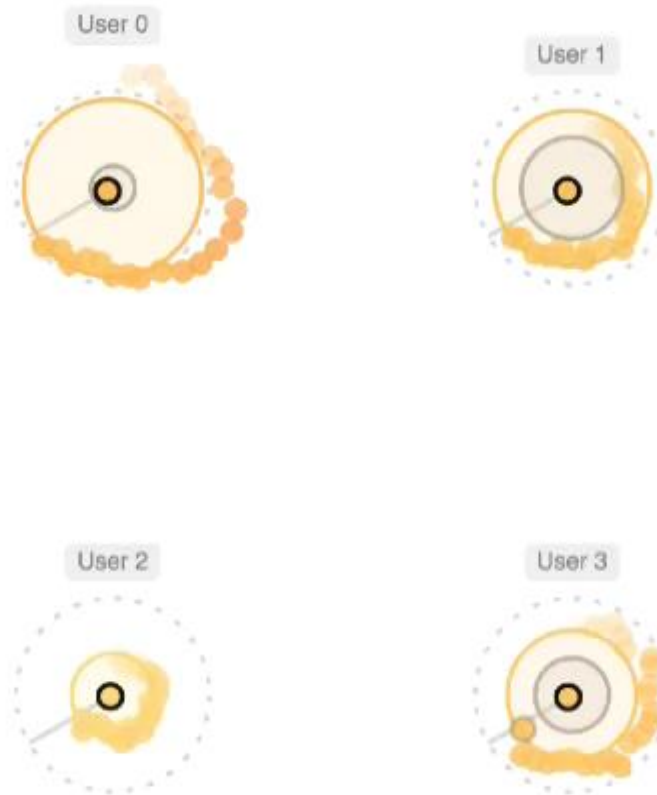# Excitement Visualization

Visual encoding of the animated dot trails:

- Clock-style
- Oscillating (with randomized direction)

a   b

Captures excitement history	Highlights peak levels of excitement
Uncluttered and precise	Double encoding of the excitement level through adaptive oscillation

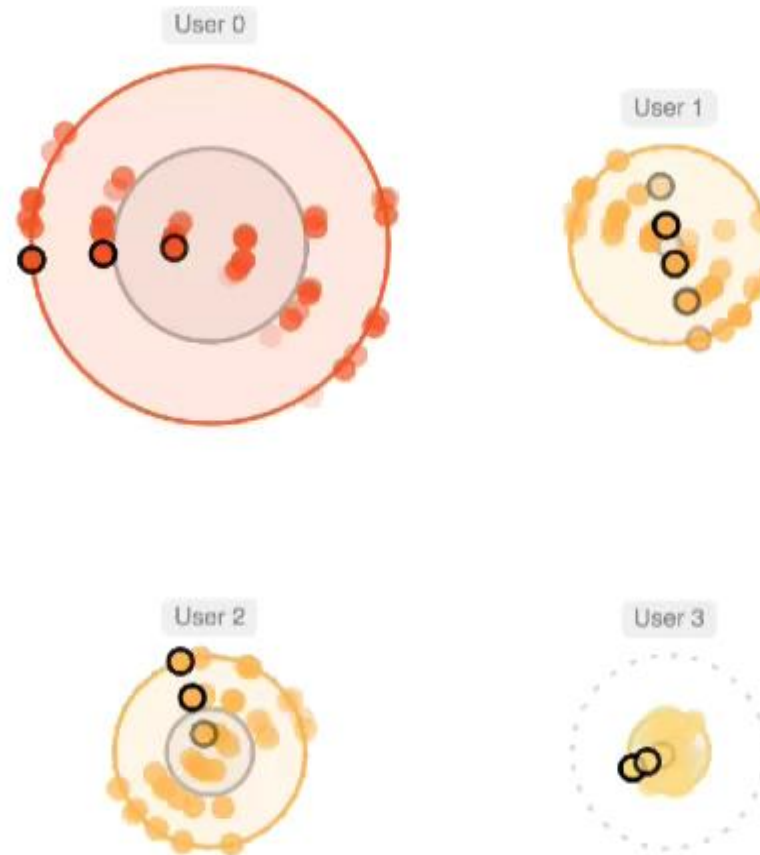# Excitement Visualization

Video

The solid grey circles represent the current experienced excitement level for each person, while the orange circles encode the current overall excitement (experienced & manifested).
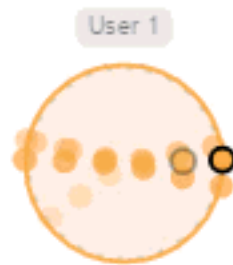
Excitement Visualization

Video

User 0

User 1

User 2

User 3

In this representation, the orange dots move side to side in concordance with the level of excitement of the person, offering a bio-inspired encoding dimension.
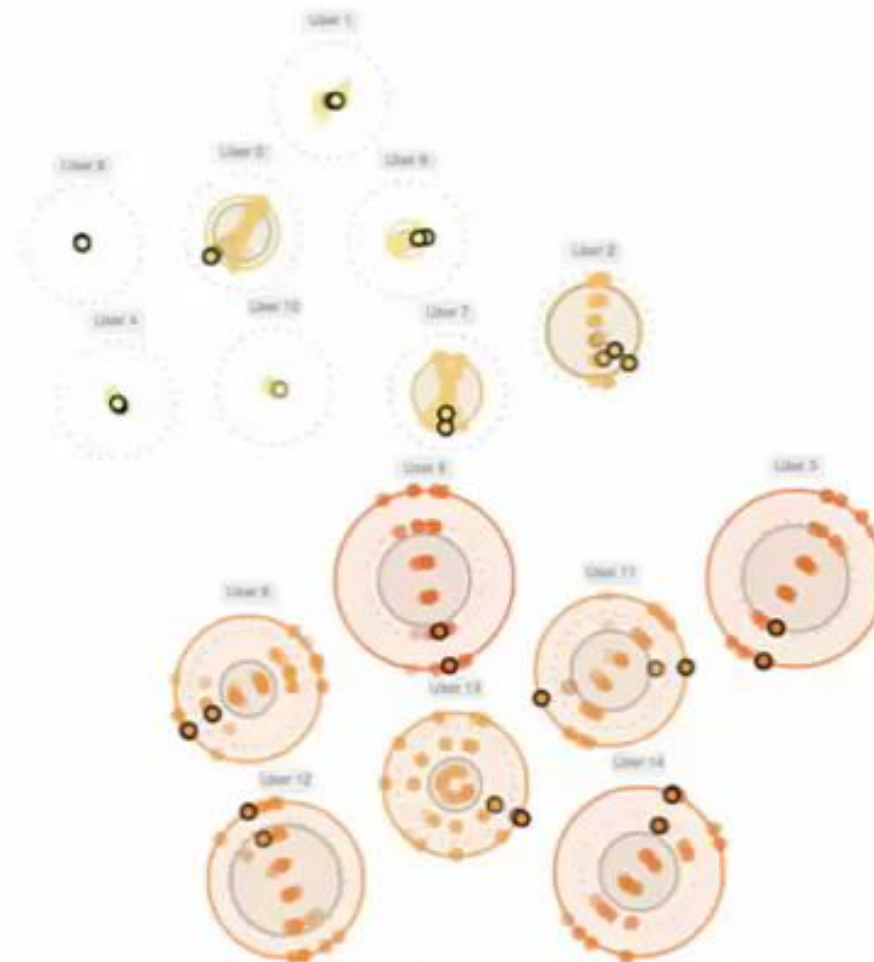
Scalability

Adaptive oscillation – better visual differentiation of excited individuals

Scalability - Clustering Force Layout
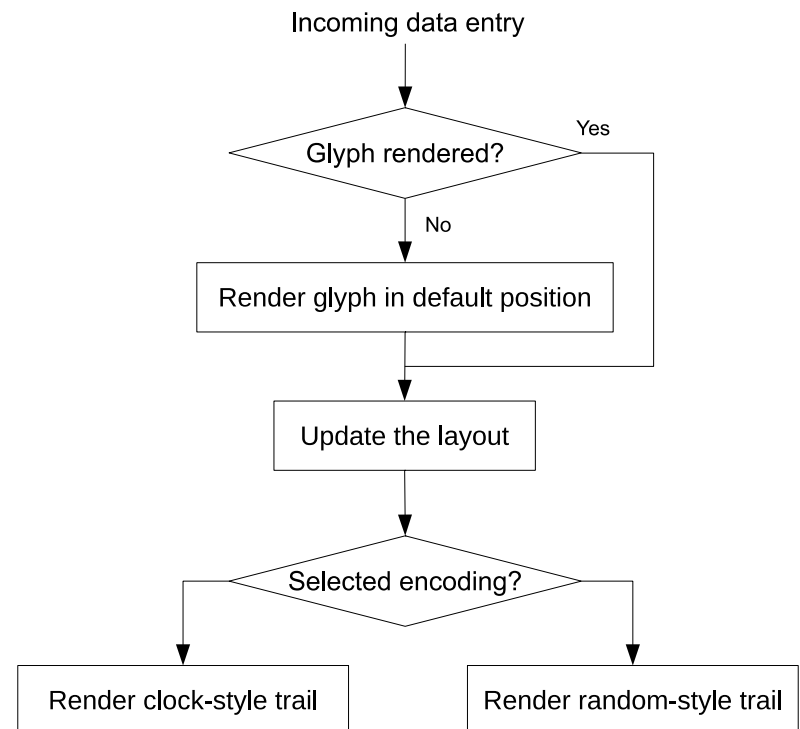
Video

Implementation

Javascript + D3

Supports both streaming data and JSON files

Handles:

- Data loss

- Streaming delay

- Unknown user IDs

- Customization for visuals and animation

```
{
  "userId": 0,
  "timestamp": 1447278131692,
  "gsr_value": 0.05450532668499117,
  "acc_value": 0.28814109834374346
}
```

Incoming data entry

Glyph rendered?

Yes

No

Render glyph in default position

Update the layout

Selected encoding?

Render clock-style trail
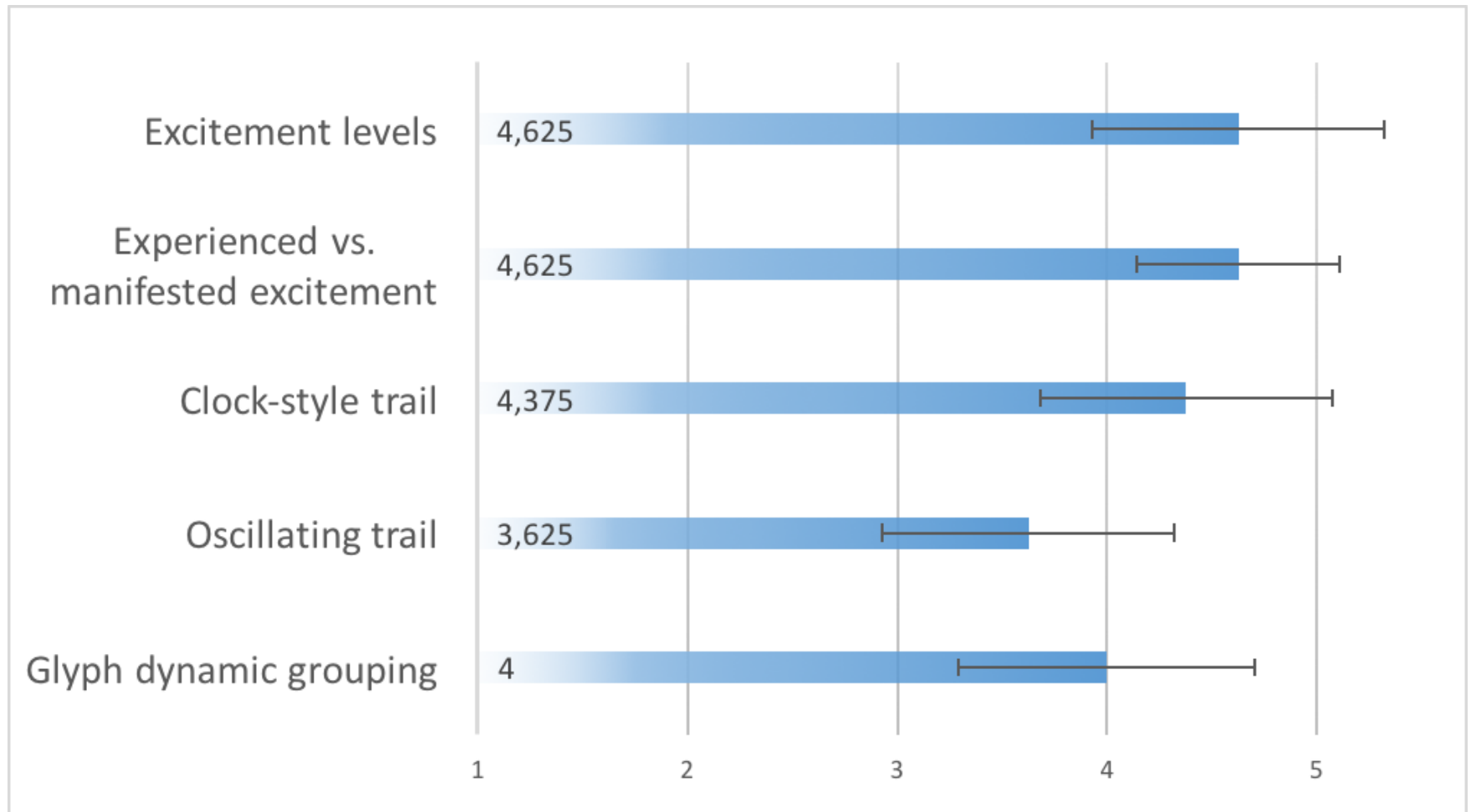
Render random-style trail

Evaluation

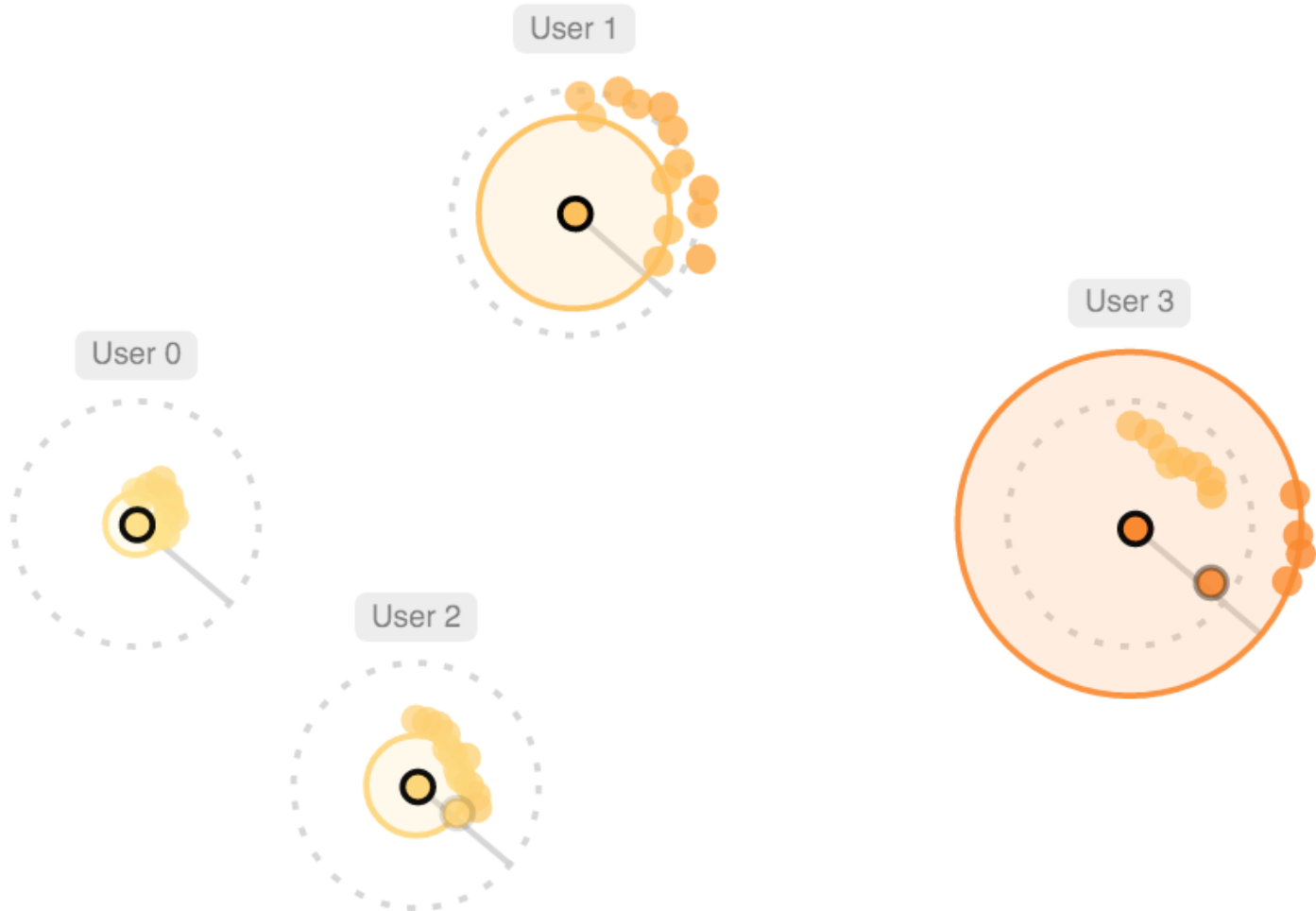Task: Explore the excitement visualization for groups of 3 to 4 people

Questionnaire related to the excitement levels of the group and the appeal of the visualization

8 participants (3 female), with ages 25 to 33

Evaluation

Evaluation

Evaluation

Open questions

+	−
Simplicity Visual design Animation	Visibility of overlapping circles

Suggestion: Incorporating valence information

Validation

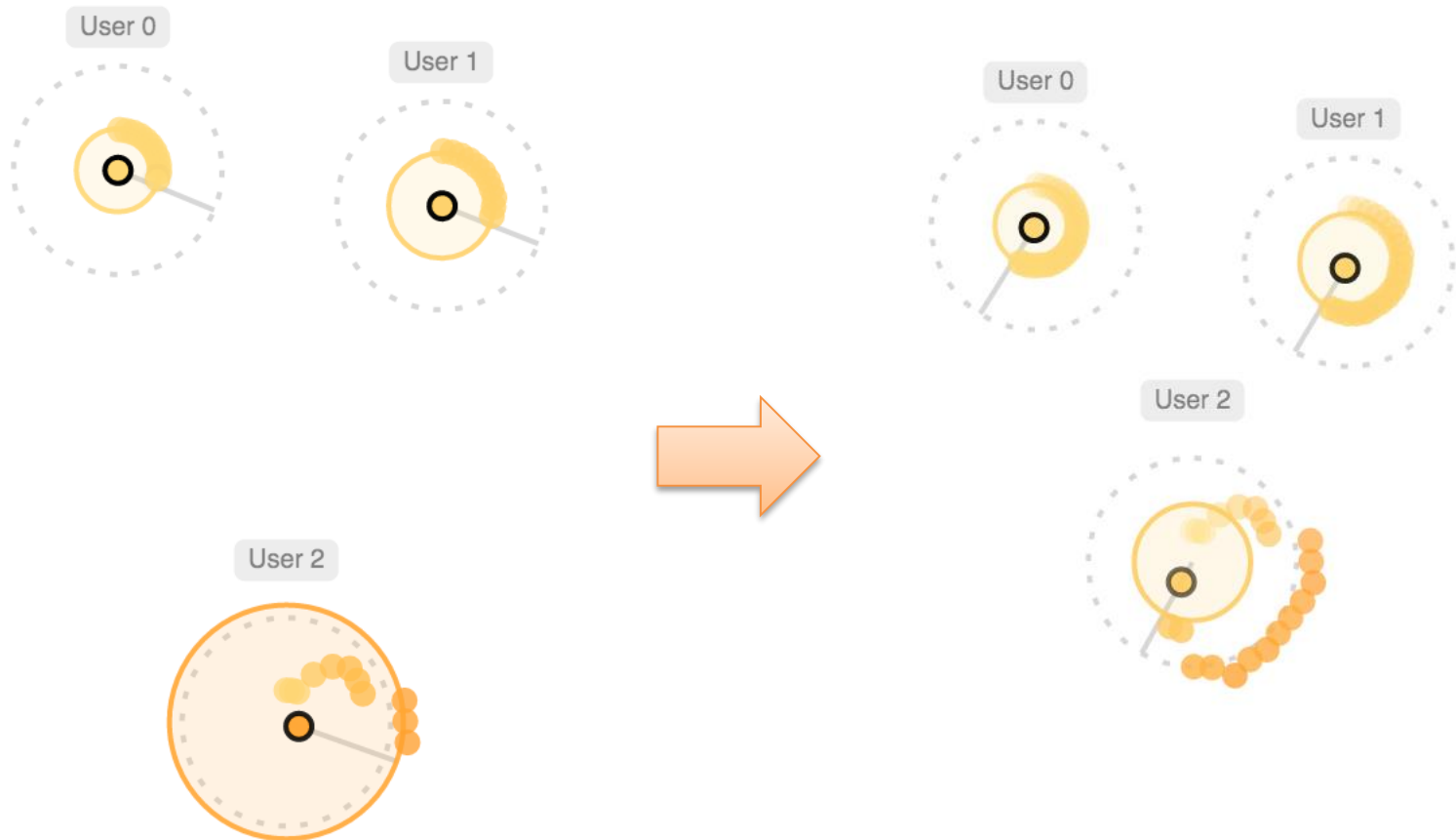Validating the data through the visualization

Comparison:

- Self-reported excitement levels vs. excitement visualization for data from cinema, opera and museum

Observations:

- Synchronized excitement
- Museum was perceived overall as less exciting

Validation

Moment of excitement for one of the participants at the museum

Conclusions

Visualizing real-time and historical excitement levels for individuals and groups through animated glyphs
- Two visual encodings: clock and oscillating
- Dynamic clustering layout

An initial evaluation offered promising results in terms of perception & insight generation

Future steps:
- Extending the timeframe of the history representation
- Improving the dynamic layout

Questions?