The Influence of Contour on Similarity Perception of Star Glyphs

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present by Kailun Zhang
What is a glyph?
Star Glyph
Primary Motivation

Data (D)

Data + Contour (D+C)

Contour (C)
Experiment 1 - Research Question

• Does contour affect people’s perception of data similarity with star glyphs?
Experiment 1 - Definition

- data similarity
  - d1 = {5,8,4} & d2 = {4,9,4}
  - d1 = {5,8,4} & d3 = {5,3,1}
Experiment 1 - Task Setup
Experiment 1 - Task Setup

- Scaled
- Rotated
- Alternative
- Correct
- Stimulus
- Scaled
- Random
- Random
- Rotated
Experiment 1 - Experiment Design

- factor 1 - contour variations (D,D+C,C)
Experiment 1 - Experiment Design

- factor 1 - contour variations (D,D+C,C)
- factor 2 - dimensionalities (high, low)
Experiment 1 - Experiment Design

• factor 1 - contour variations (D,D+C,C)

• factor 2 - dimensionalities (high, low)

• factor 3 - expertise (novice user, expert user)
Experiment 1 - Result

Low Dimensional

High Dimensional

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<thead>
<tr>
<th>Selections in percent</th>
<th>D</th>
<th>D+C</th>
<th>C</th>
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Experiment 1 - Result

High Dimensional
Experiment 1 - Discussion

• the negative effect of contour

• Judging shape rather than data similarity
Experiment 2 - Question

• If viewers do not know which similarity they are looking for, will they go with shape similarity or data similarity?
Experiment 2 - Experiment Design

- factor 1 - contour variations (D, D+C, C)
- factor 2 - dimensionalities (high, low)
- factor 3 - filling types (Fill, No-Fill)
Experiment 2 - Task Setup
Experiment 2 - Result

Low Dimensional

High Dimensional
Experiment 2 - Result

![High Dimensional Selections in Percent Chart]

- **Data**
- **Rotated**
- **Scaled**

Selects in percent:
- D
- D+C
- C
- D
- D+C
- C
Experiment 2 - Discussion

• Natural tendency of people to judge glyphs
  • low-dimension: “data-centric”
  • high-dimension + D: “data-centric”
  • high-dimension + C (+ D) : “shape-centric”
Experiment 3 - Research Question

• Can we improve accuracy of data similarity by adding reference structures?
Experiment 3 - Experiment Design

- factor 1 - contour variations (D,D+C)
- factor 2 - improvements (basic, T, G)
Experiment 3 - Result & Discussion
Experiment 3 - Result & Discussion

- Strongly preferred
  - D+C
  - D+C+G
- Hardest to use
  - D
Critics

- Methodology-wise
  - Participant group
  - Order effect of conditions

- Content-wise
  - Generalizability to other glyphs?
  - Cut-off point in dimensionality
Data lines only (D)

- a)
- b)
- c)

Data lines + Contour (D+C)

- d)
- e)
- f)
- g)

Contour only (C)

- h)
- i)