

Übung zur Vorlesung

Informationsvisualisierung

Alexander De Luca, Emanuel von Zezschwitz
Ludwig-Maximilians-Universität München
Wintersemester 2011/2012

Visualizing Multivariate Data

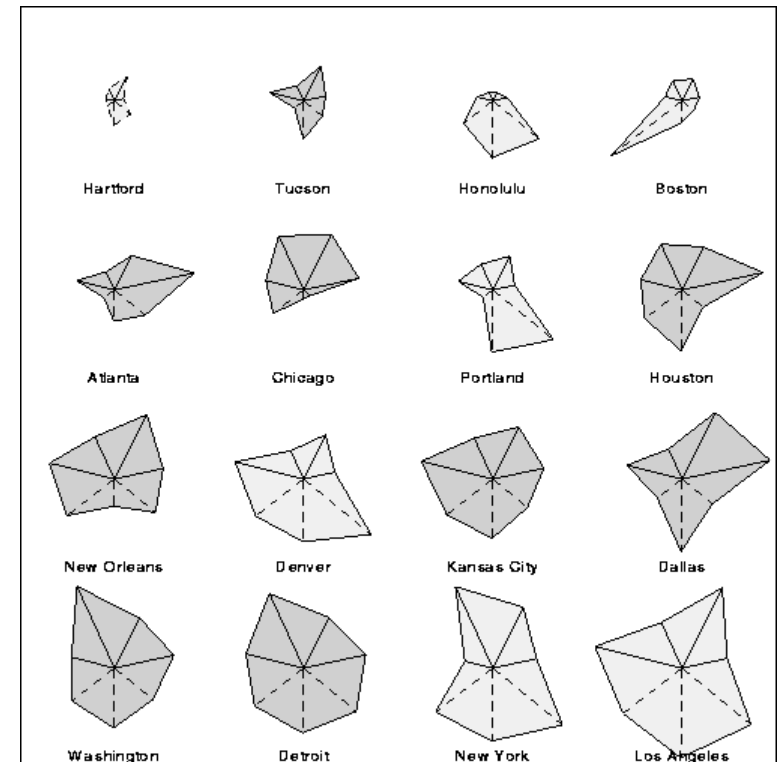
Variables > 3

Glyphs

- Small-sized visual symbols
- Variables are encoded as properties of glyph
- Each case is represented by a single glyph
- **Main Limitation:** Have to be learned

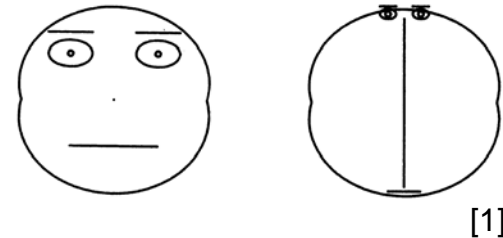
Star Glyphs

- aka web diagram, spider chart, star diagram ...
- Radial axes representing the variables
- Allows for comparison based on the shape of the resulting object
- Limitations:
 - Works for small data sets only [3]
 - Hard to compare fine differences in spoke lengths
 - Thus better suited for identifying outliers



Chernoff Faces

- Theory
 - Humans are able to recognize small changes in facial characteristics
 - Data is encoded by stylized faces using up to 18 characteristics



- Limitations
 - Extreme values negatively influence the impression of a face and the recognition of other values [1]
 - Experiments [2] reveal that recognition of Chernoff faces is a serial process and thus there is no significant advantage over other iconic visualization

Your Turn

- Nominal values:
 - degree program (Media Informatics, Informatics, KuM)
 - relationship (yes/no)
- Ordinal Values:
 - Grades in MMI1, Infovis, DBS, Theoretical Computer Science, Distributed Systems

Visualize this!

Student	Course	Relationship	MMI 1	Infovis	DBS	Theor.	DS
1	MI	yes	2	1	2	4	2
2	Inf	no	2	2	1	2	1
3	KuM	yes	2	1	4	5	4
4	KuM	no	1	2	3	3	2
5	MI	no	1	1	2	2	2
6	Inf	yes	2	1	2	4	3
7	Inf	no	3	2	1	2	2
8	MI	yes	2	1	2	3	3
9	KuM	yes	1	2	3	4	5

Referenzen

1. Bernhard Flury and Hans Riedwyl. Graphical Representation of Multivariate Data by Means of Asymmetrical Faces. *Journal of the American Statistical Association*, Vol. 76, No. 376, pp. 757-765. 1981
2. Christopher J. Morris, David S. Ebert and Penny L. Rheingans, "Experimental analysis of the effectiveness of features in Chernoff faces", Proc. SPIE 3905, 12. 2000
3. NIST/SEMATECH (2003). Star Plot in: e-Handbook of Statistical Methods.
4. Siegel, J. H. & Goldwyn, R. M. & Friedman, H. P.. (1971). Pattern and Process of the Evolution of Human Septic Shock. *Surgery*. 70. 232-245.