

Gestalt Perception For Decomposition of Images

Rahul Meena

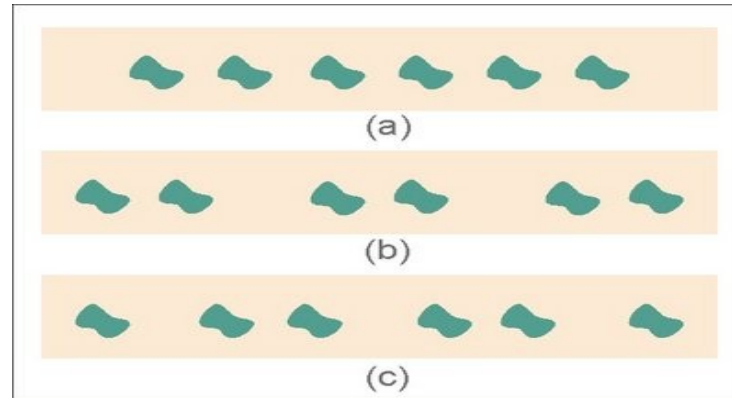
Advisor : Amitabha Mukherjee

Introduction

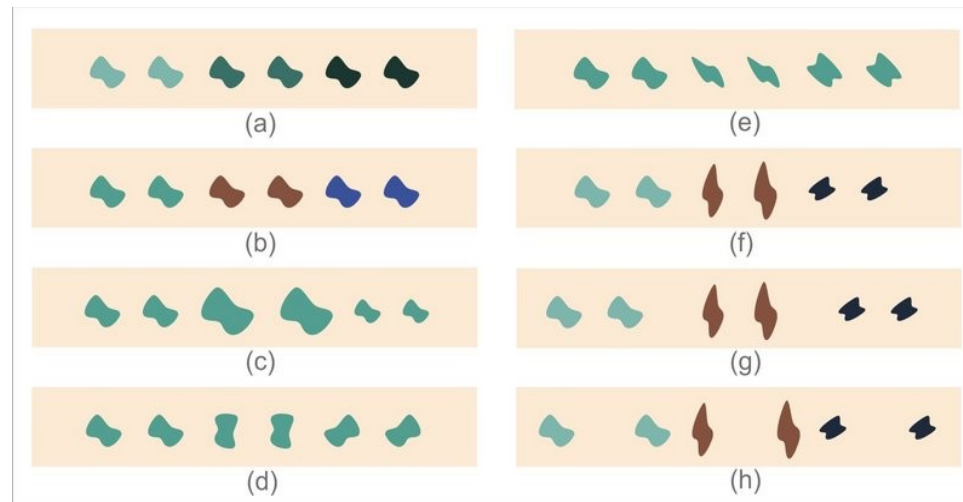
- What does Gestalt mean?
 - form, shape, pattern
- What does Gestalt theory mean?
 - described in 1910
 - perceptual theory for perceptual organisation
 - explains how to we perceive and recognise patterns
 - “whole is more than the sum of their parts” (Kohler, 1920)
 - Six main factors

Introduction cont.

- Proximity

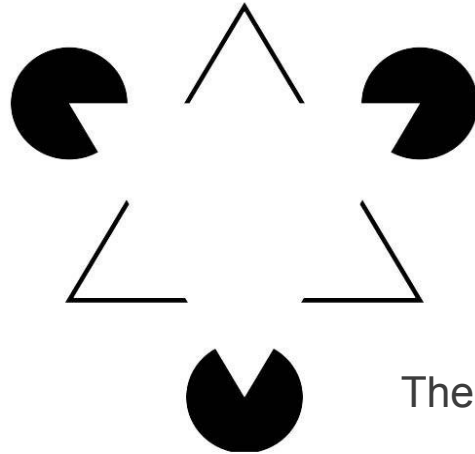


- Similarity



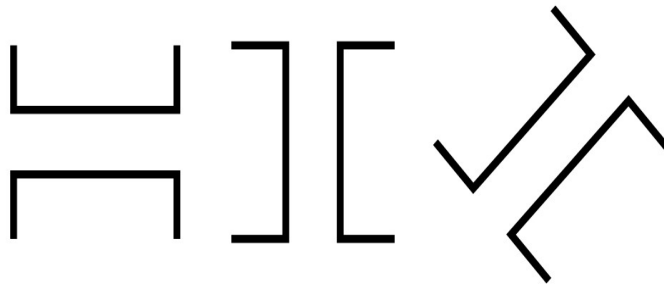
Introduction cont.

- Closure



The Kanizsa Triangle

- Symmetry



Introduction cont.

- Common Fate/Motion

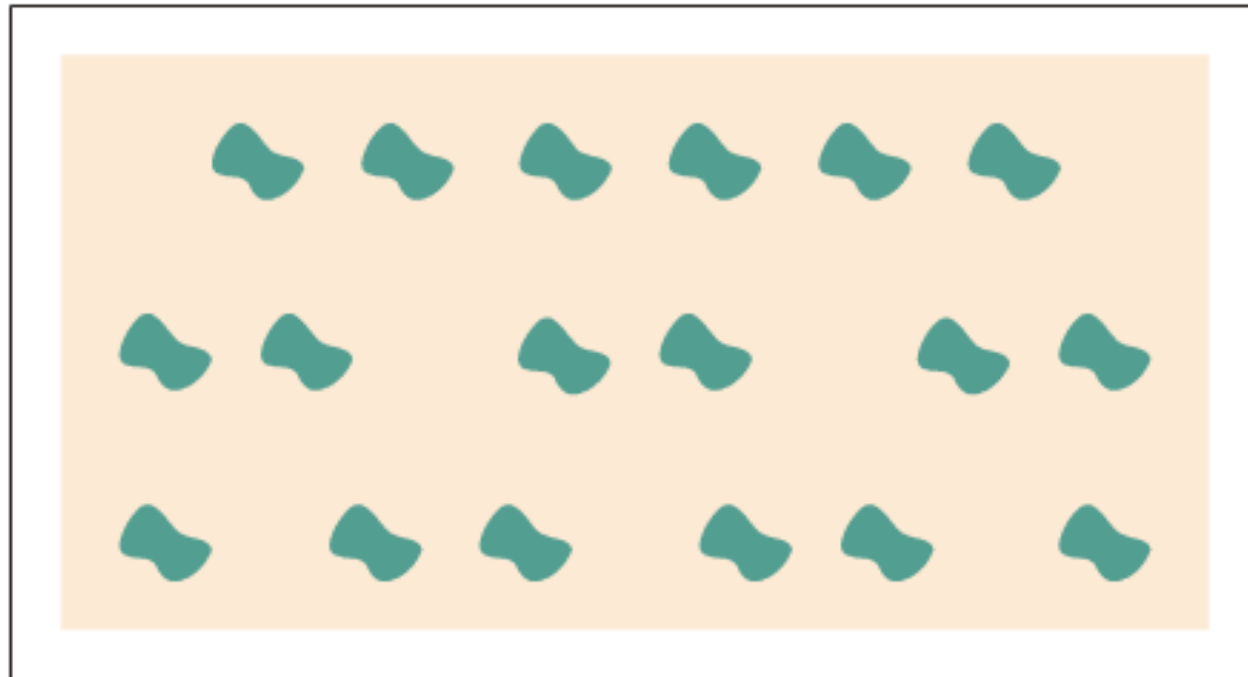


Image source: Dejan Todorovic (2008) Gestalt principles. Scholarpedia, 3(12):5345.

Introduction cont.

- Common Fate/Motion

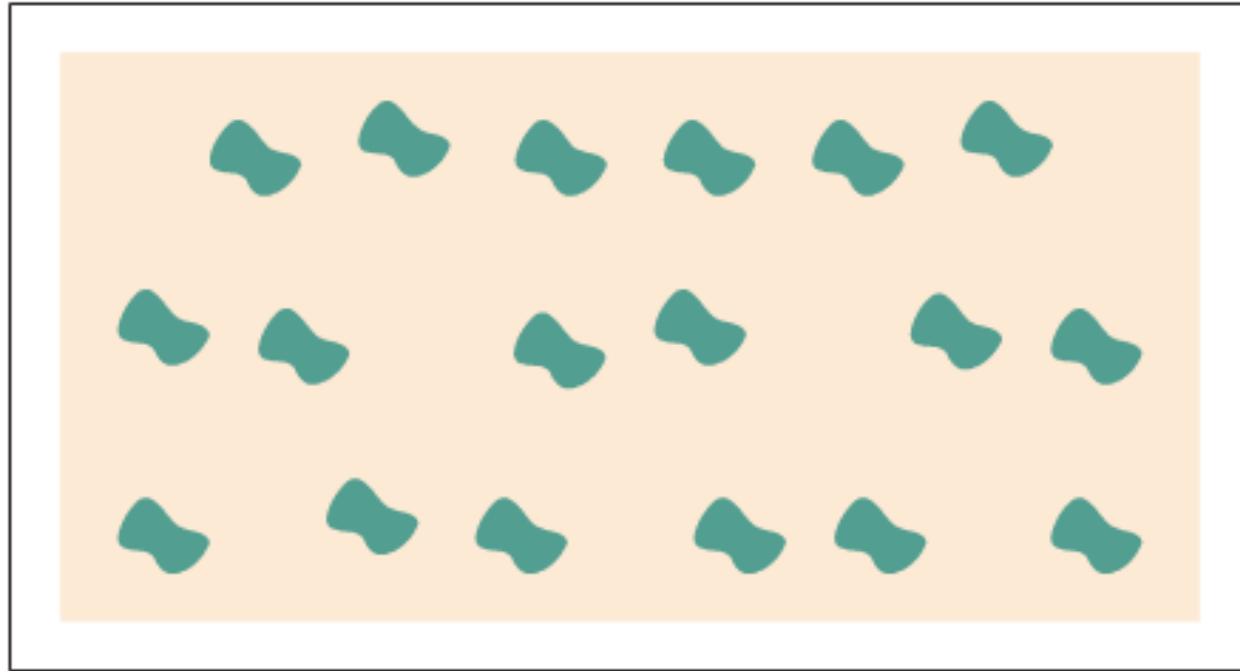


Image source: Dejan Todorovic (2008) Gestalt principles. Scholarpedia, 3(12):5345.

Introduction cont.

- Continuity

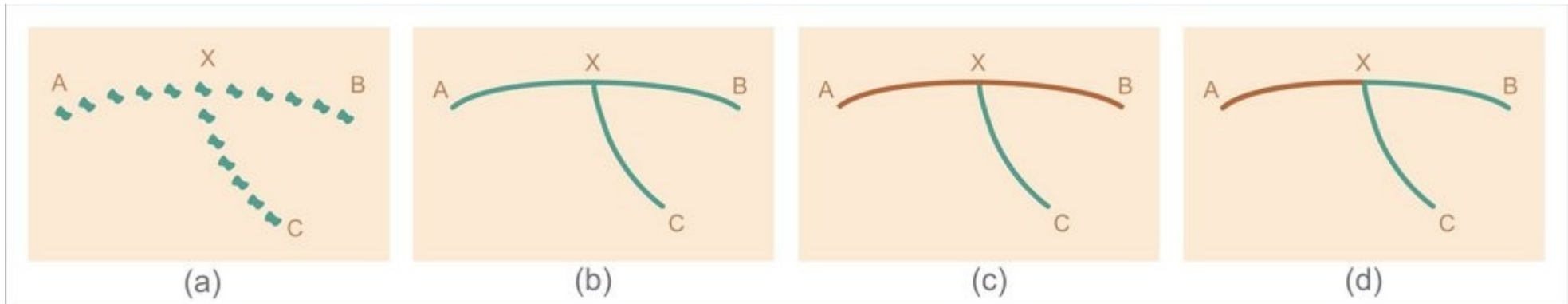
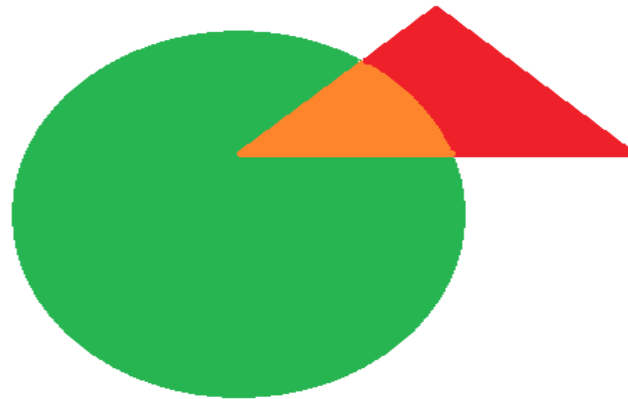


Image source: Dejan Todorovic (2008) Gestalt principles. Scholarpedia, 3(12):5345.

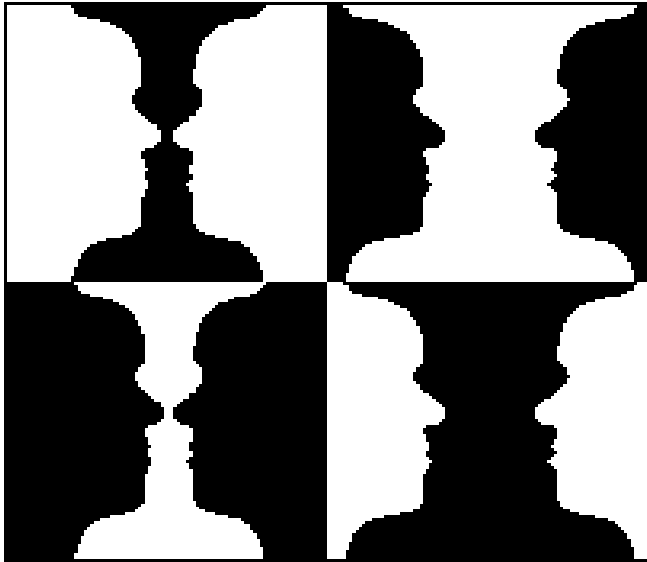
Motivation

- Robots should see the world the way humans do
- Implementation of gestalt principles for object segmentation



Experiment

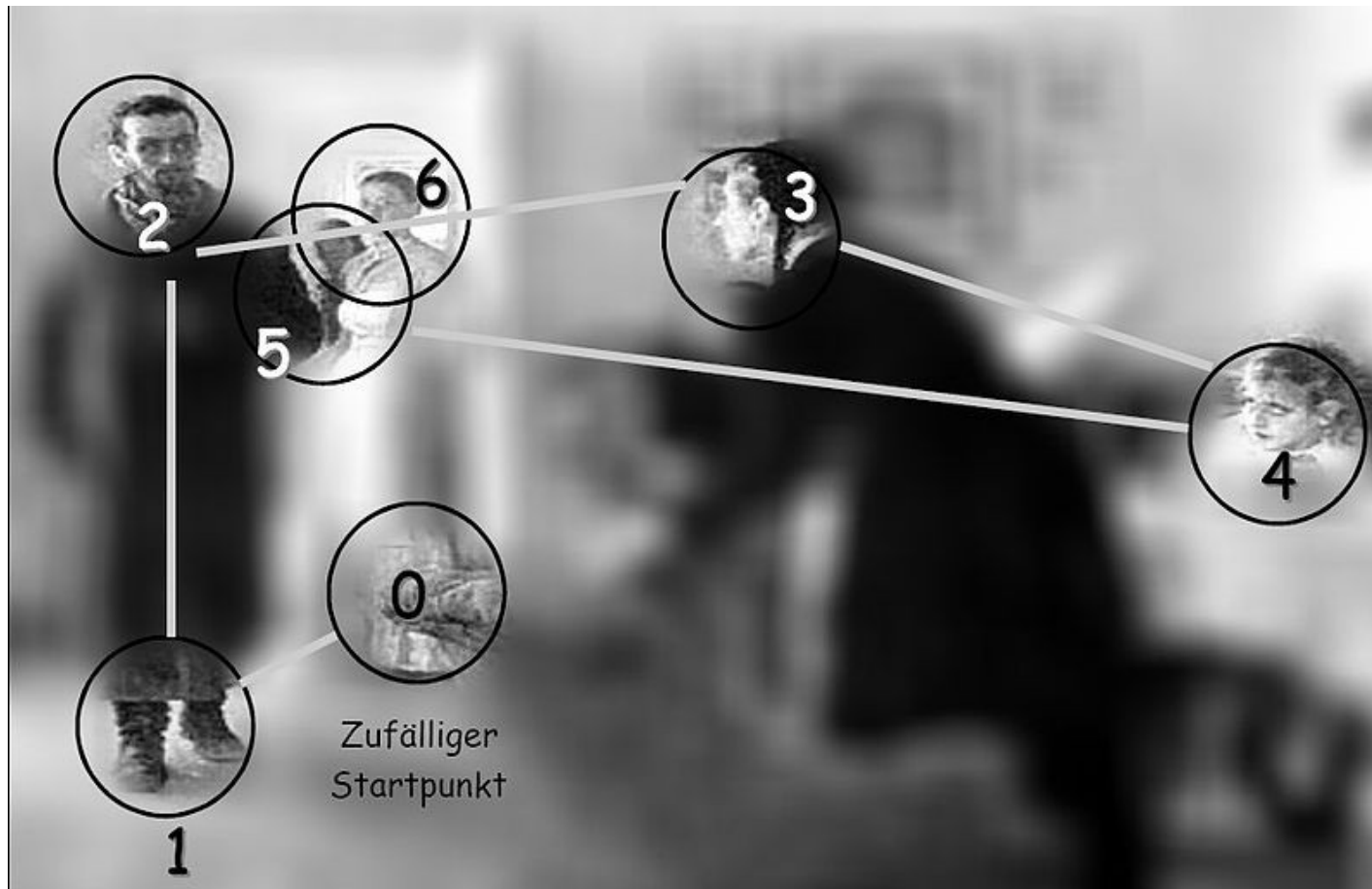
- How we decompose parts of an image



The Rubin Vase

My Approach

- Eye gaze tracking system



Eye movement first 2 seconds (**Yarbus**, 1967)

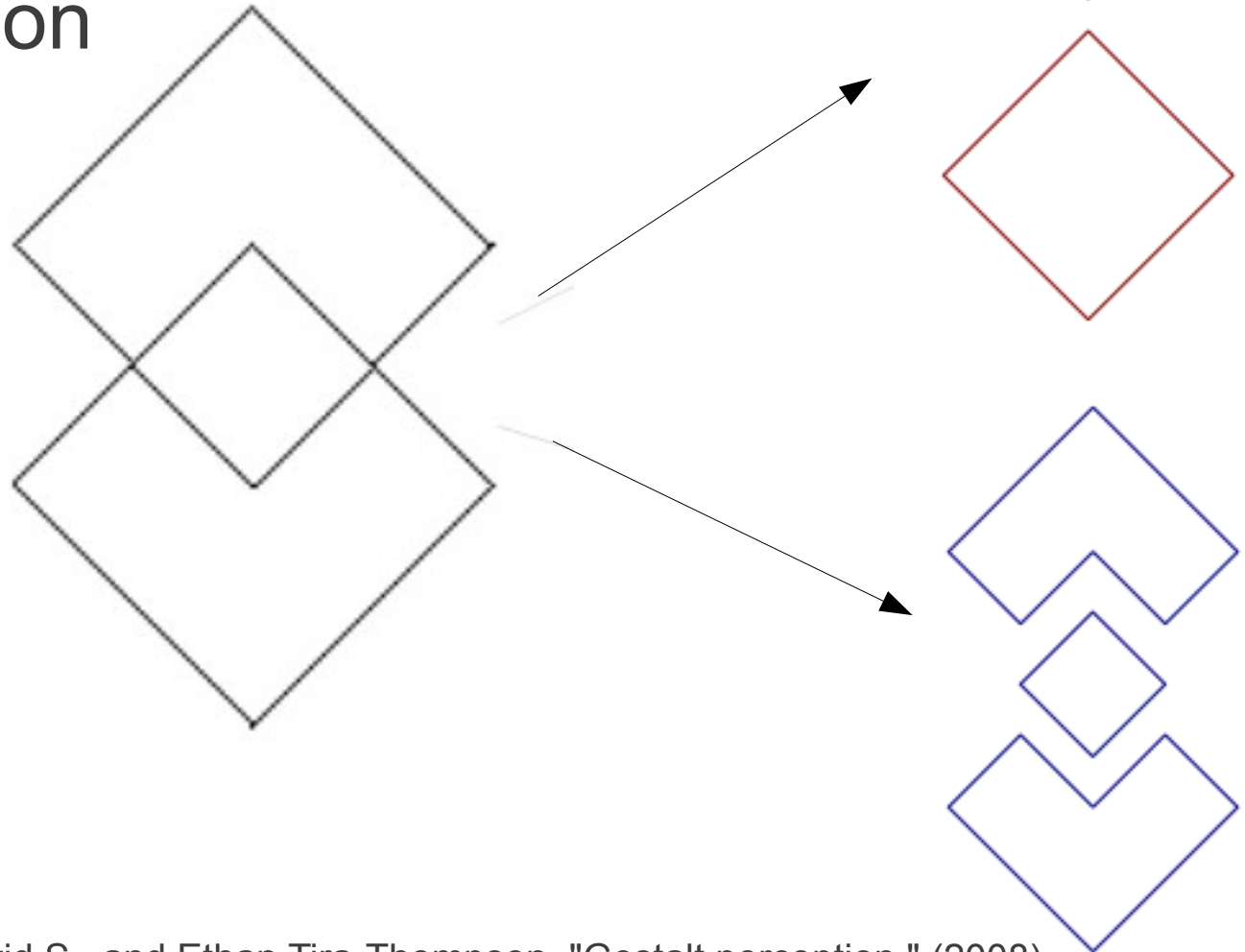
Bild 11: Foveale Ergänzung durch die ersten 6 Fixationen (nach Daten von *Yarbus, 1967*)

My Approach cont.

- 10 images per subject
- 5 seconds per image
- Subjects will be asked to remember what they decomposed in each image
- Analyze the answer with the tracked image to see which gestalt law is preferred for the decomposition
- Image set made using MS Paint/word

My Approach cont.

- How past experience affects the decomposition



References

- Dejan Todorovic (2008) Gestalt principles. Scholarpedia, 3(12):5345.
- Touretzky, David S., and Ethan Tira-Thompson. "Gestalt perception." (2008)
- Implementation of Gestalt Principles for Object Segmentation, *Andreas Richtsfeld, Michael Zillich and Markus Vincze, Automation and Control Institute(ACIN), Vienna University of Technology, 2012*

Thank You

Some Images

