Inference in CG and Art of Illusion

Karan Singh
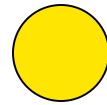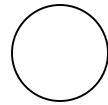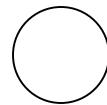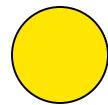
dgp Dynamic Graphics Project
University of Toronto
www.dgp.toronto.edu

Warning lights

Warning lights
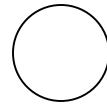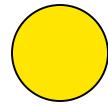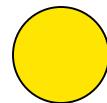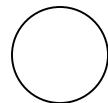
Agenda

- Gestalt and Hidden Imagery

- NPR

- Luminance, Contrast and Colour

- Geometry and Shape

- Space, Size and Perspective

- Motion & Time

- Faces

Gestalt Principles of Visual Perception

- Gestalt – Movement in experimental psychology which began prior to WWI. (Wertheimer, Kohler, Koffka).

- We perceive objects as well-organized patterns rather than separate components.

- "The whole is greater than the sum of it's parts."

- Based on the concept of "grouping".

Gestalt Principles of Visual Perception

W.E. Hill, 1915

German postcard, 1880

We impose visual organization on stimuli

# Gestalt Principles of Visual Perception

- Grouping: proximity, similarity, continuity, closure.

- Goodness of figures.

- Figure/ground relationships.

# Gestalt Grouping

Proximity
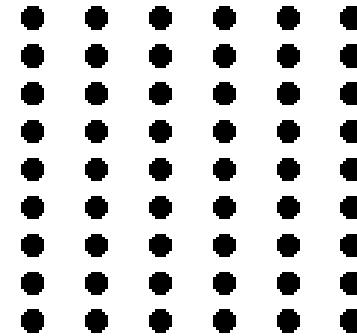
Similarity
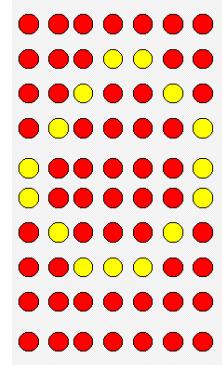
Closure
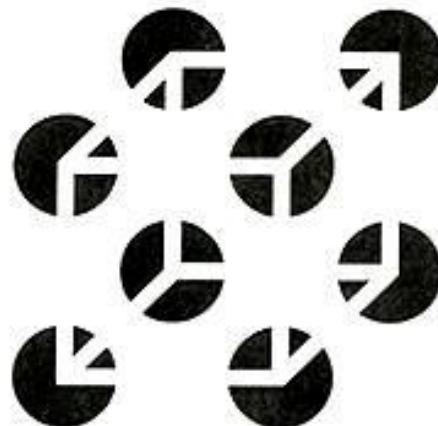
Gestalt Goodness of Figure (Pragnanz)

Example of Good Figure

# Gestalt Figure/Ground Relationships
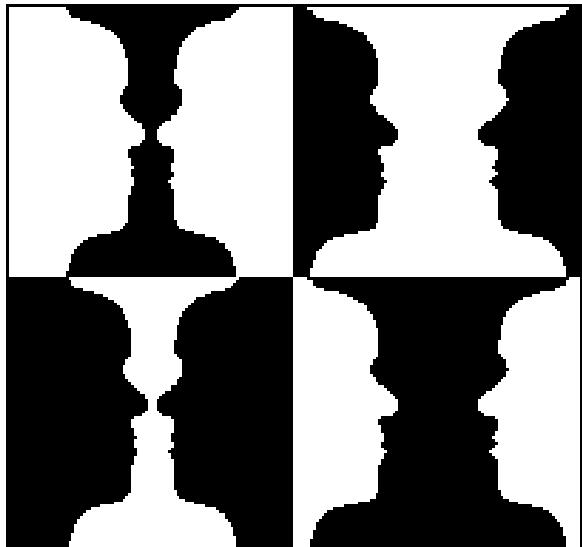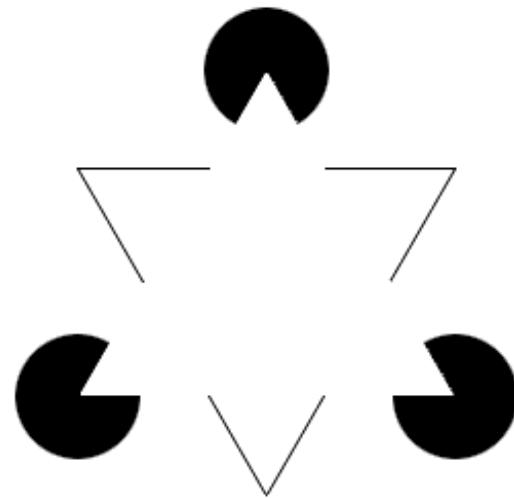
Problems with Gestalt

- Phenomenological approach.

- Can be vague (e.g. what is the "simplest" form?).

Emergence

http://graphics.stanford.edu/~niloy/research/emergence/emergence_image_siga_09.html

Emergence

Hidden Imagery
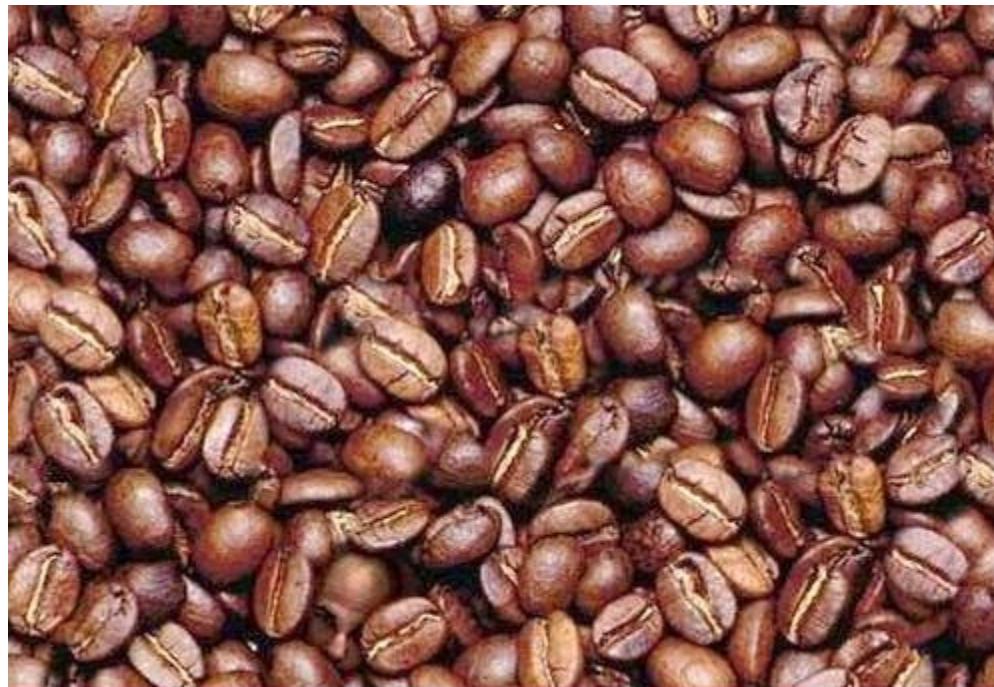
Hidden Imagery

# Hidden Imagery
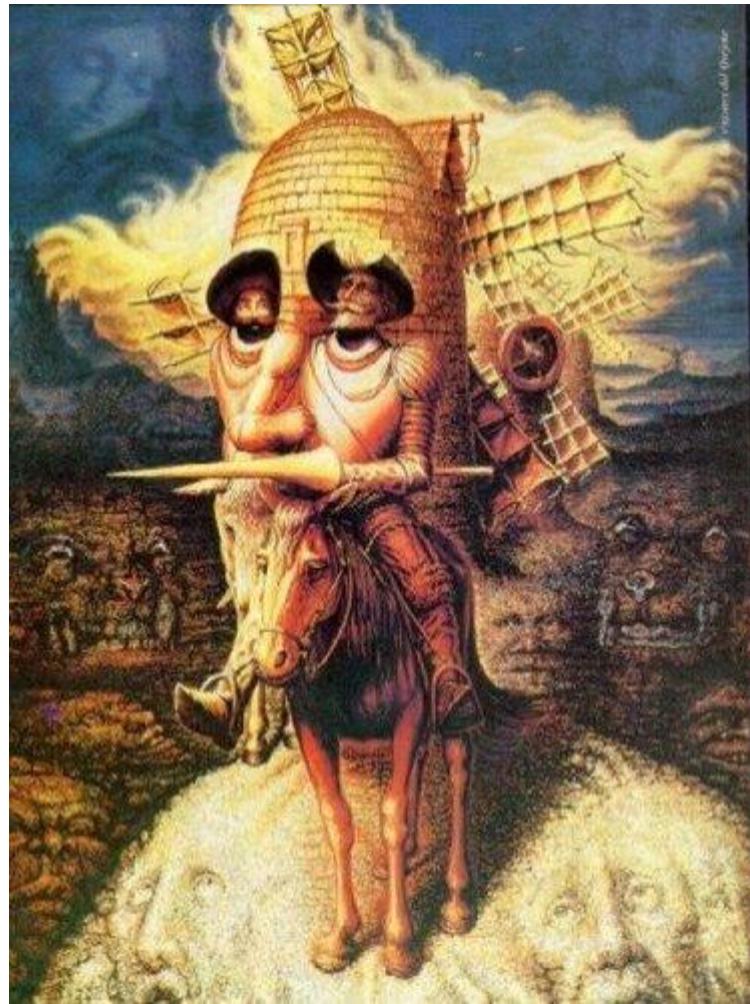
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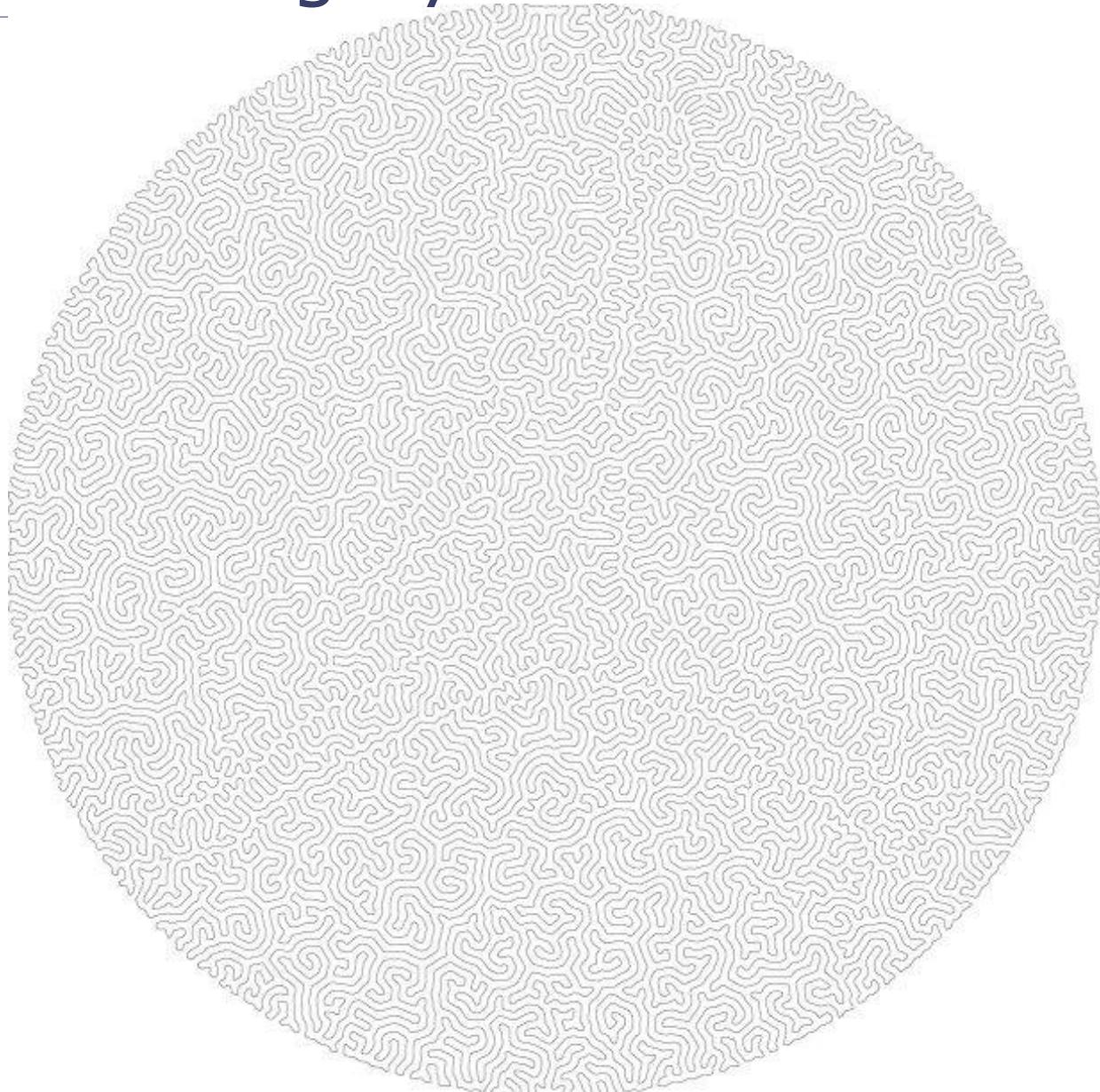
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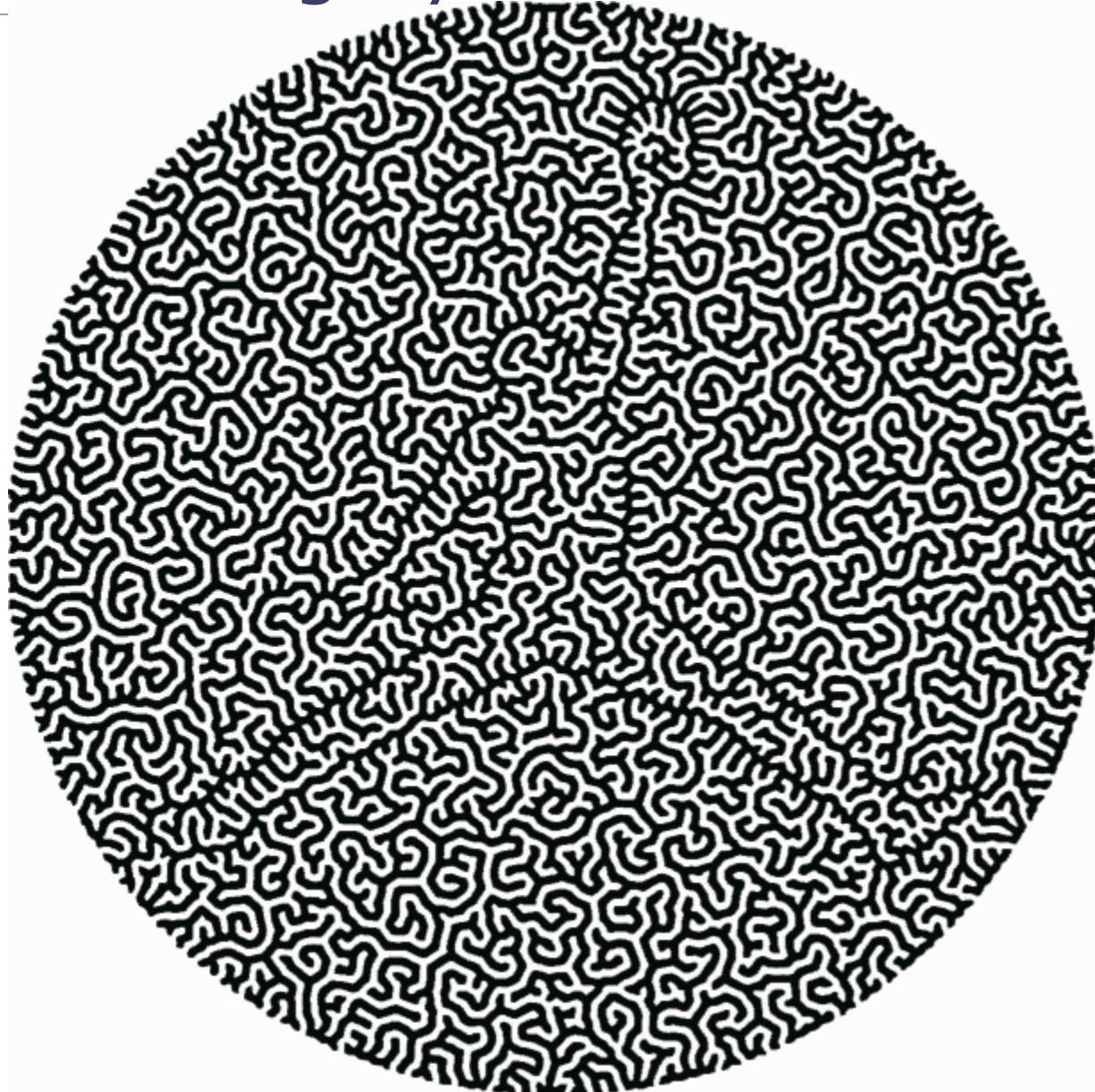
# Hidden Imagery

Hidden Imagery
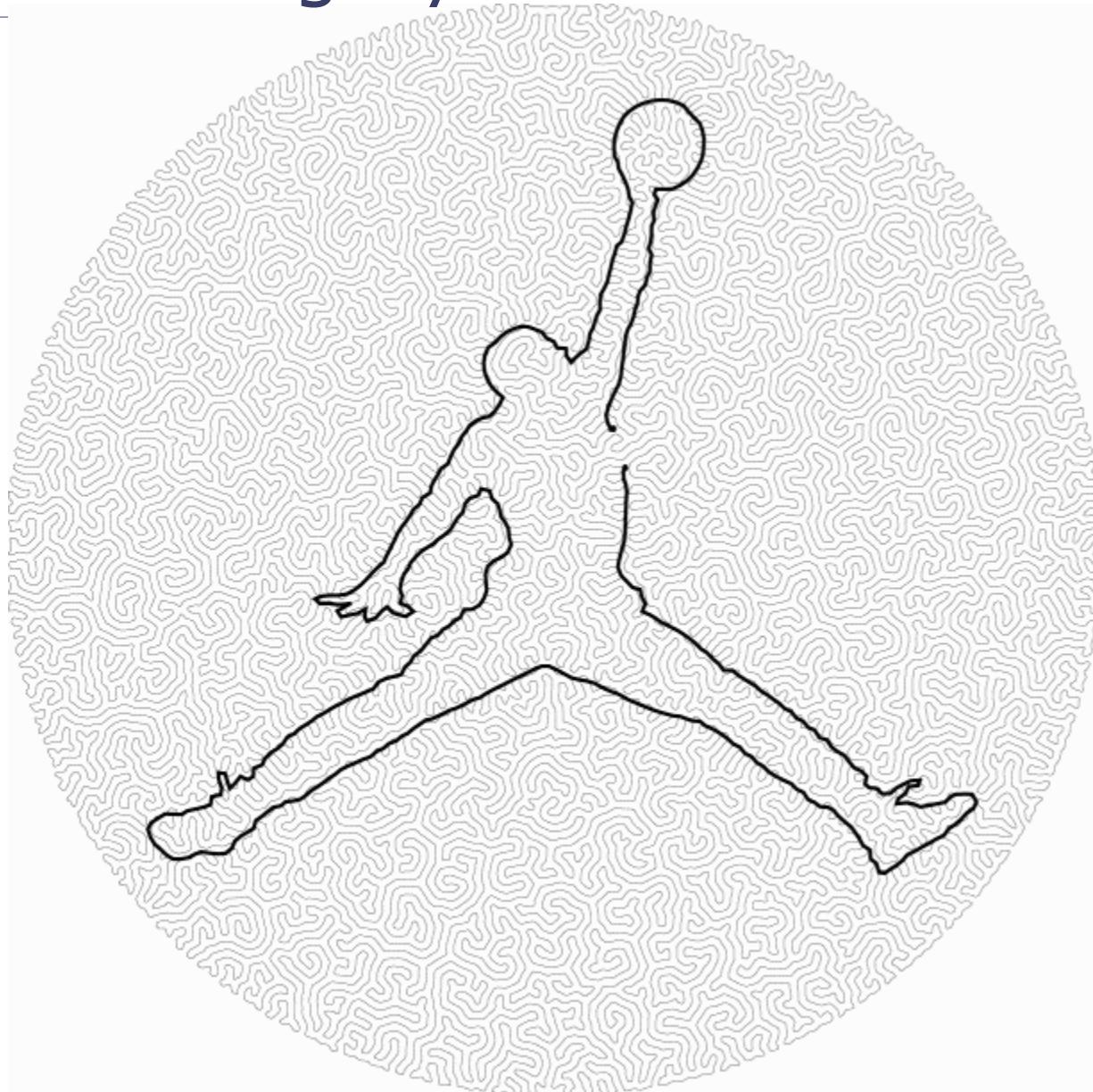
How can CG see what we see?

- Shape (silhouettes, features, lines).
- Value (shading, curvature, lighting).
- Space (Segments, relationships of parts).

Important lines
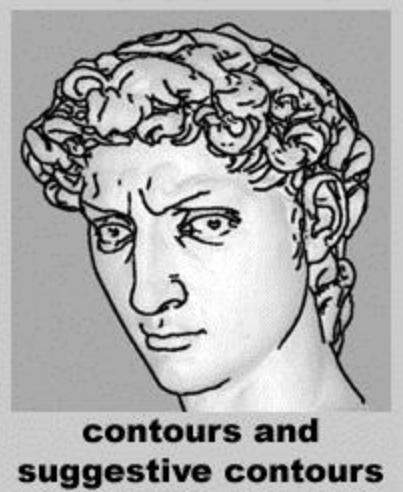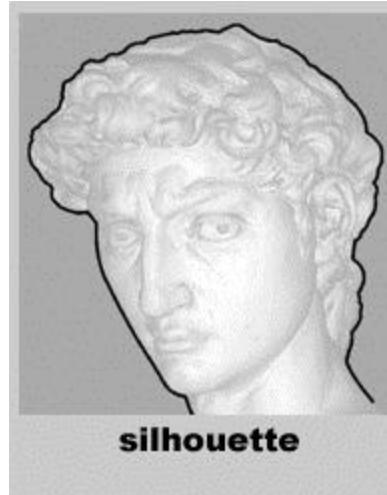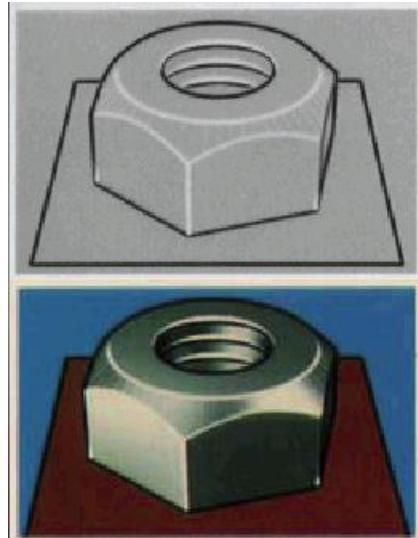
ridges & valleys

silhouette

contours

contours and
suggestive contours

Silhouettes

silhouette

N frontfacing

N backfacing
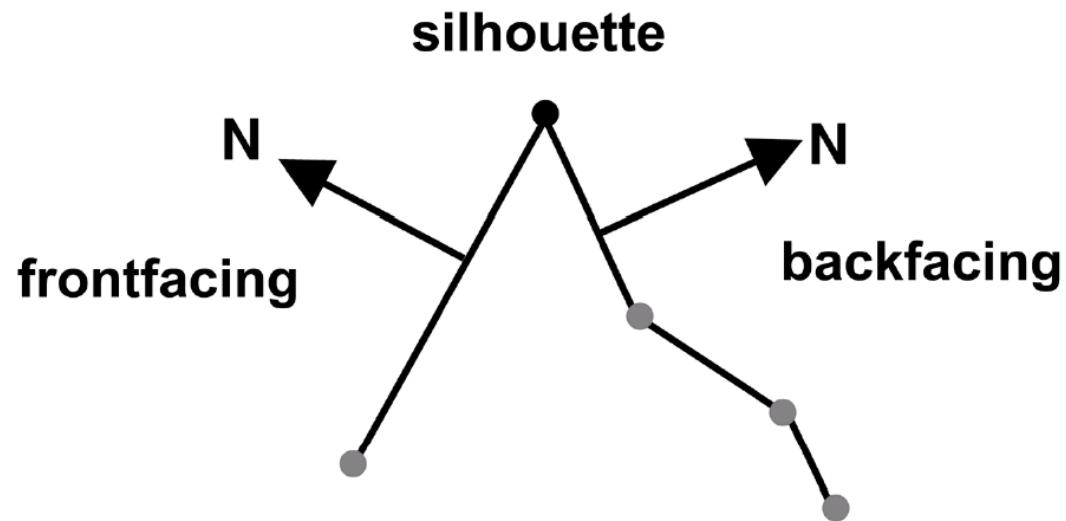
Lines+Shading
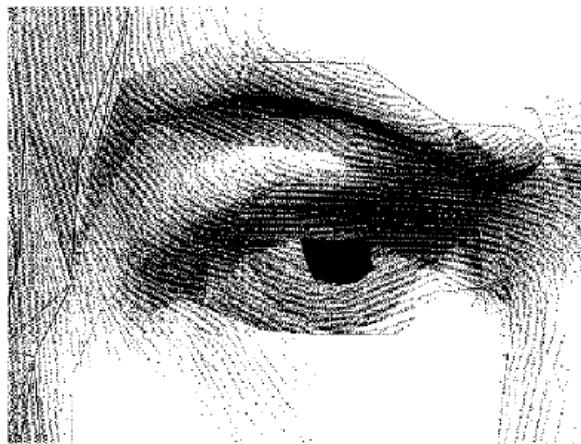
Value: hollow face illusion

Mooney Faces

Geometry and Shape (Necker Cube)
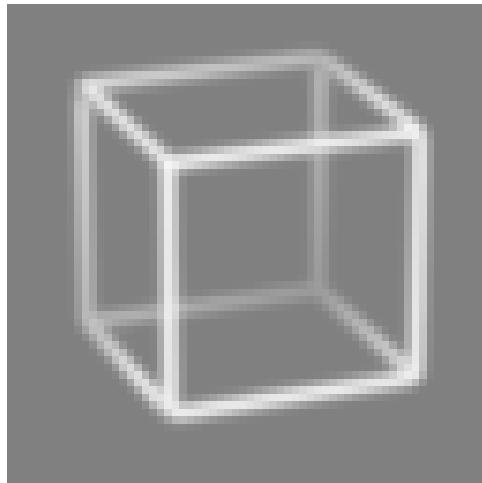
Space

Space and Perspective
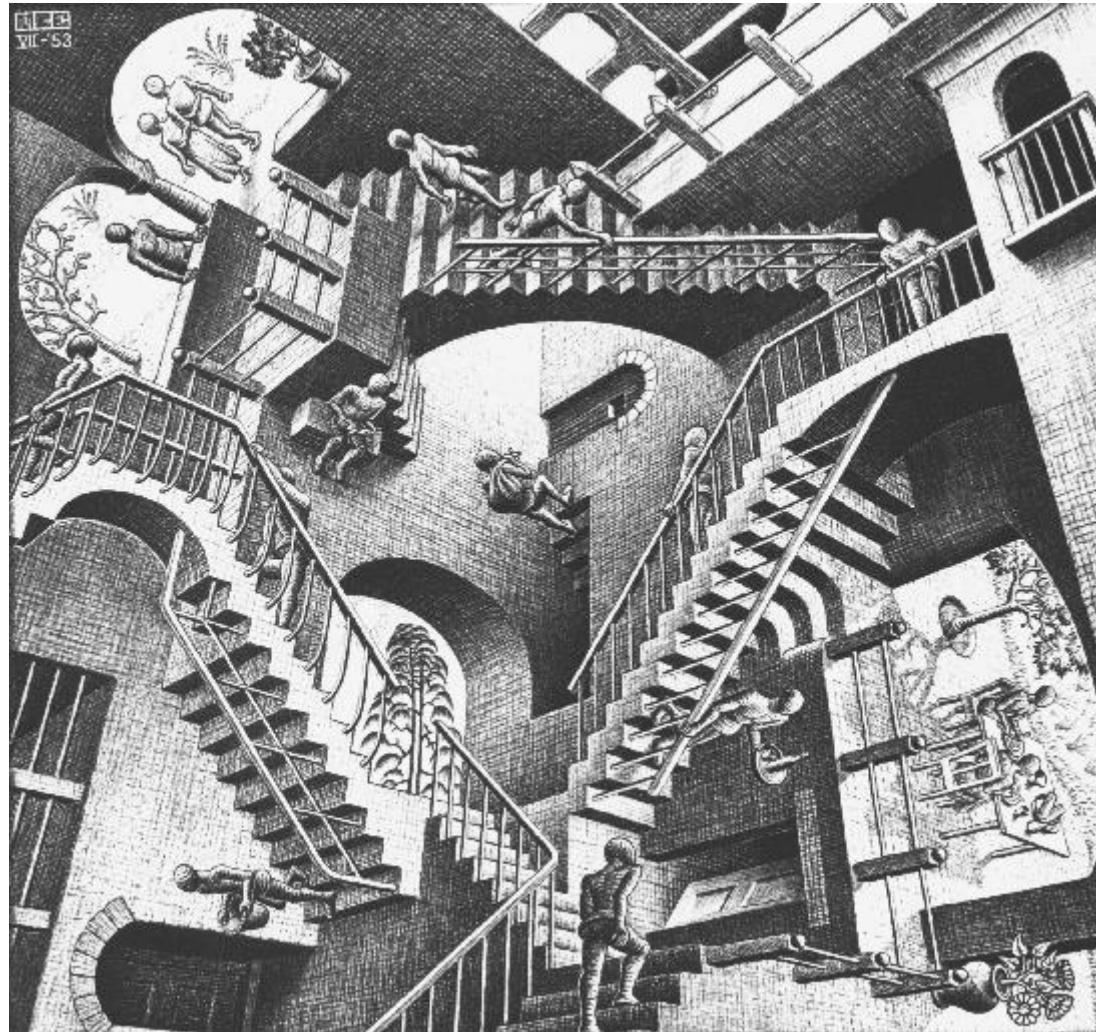
Examples of NPR
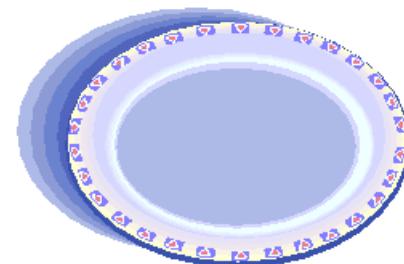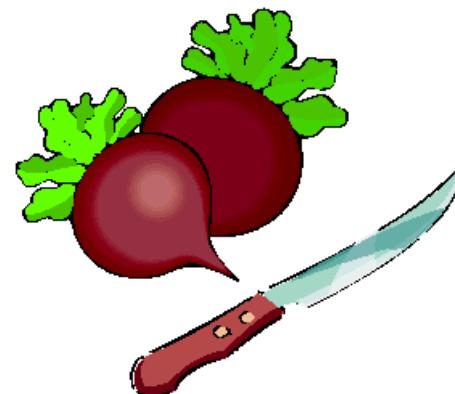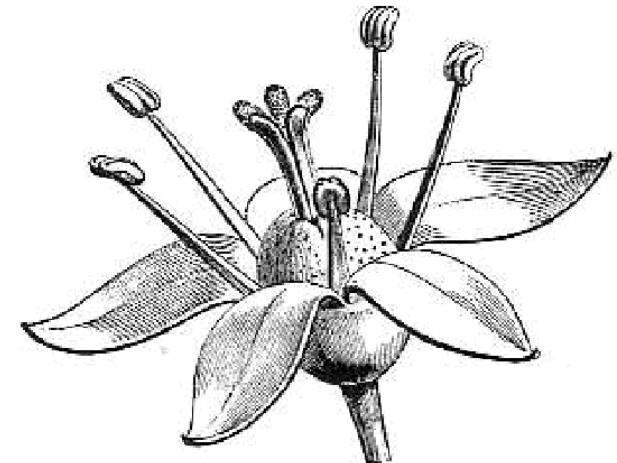
Motion and Time (Edges to Moonwalks)

MOON WALK (FLOATING)
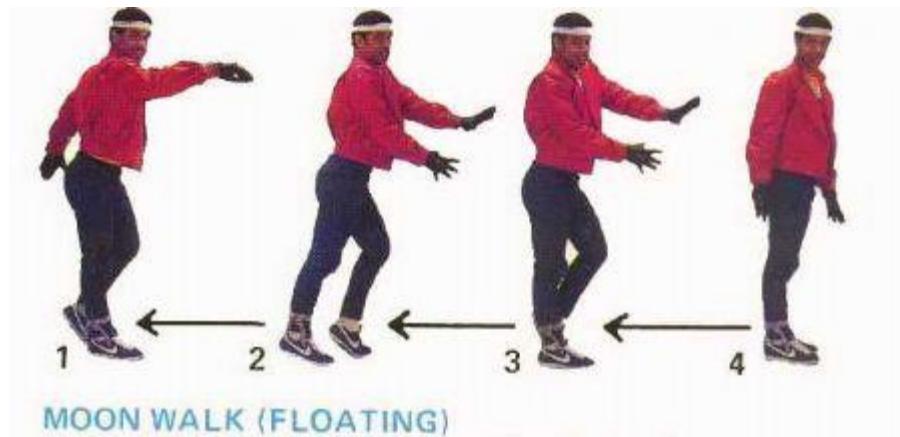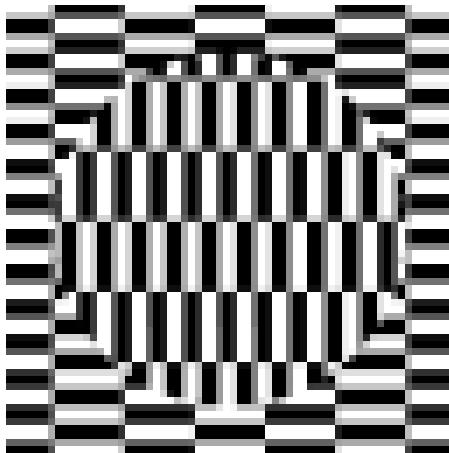
Faces (Thatcherization)

Faces (Thatcherization)