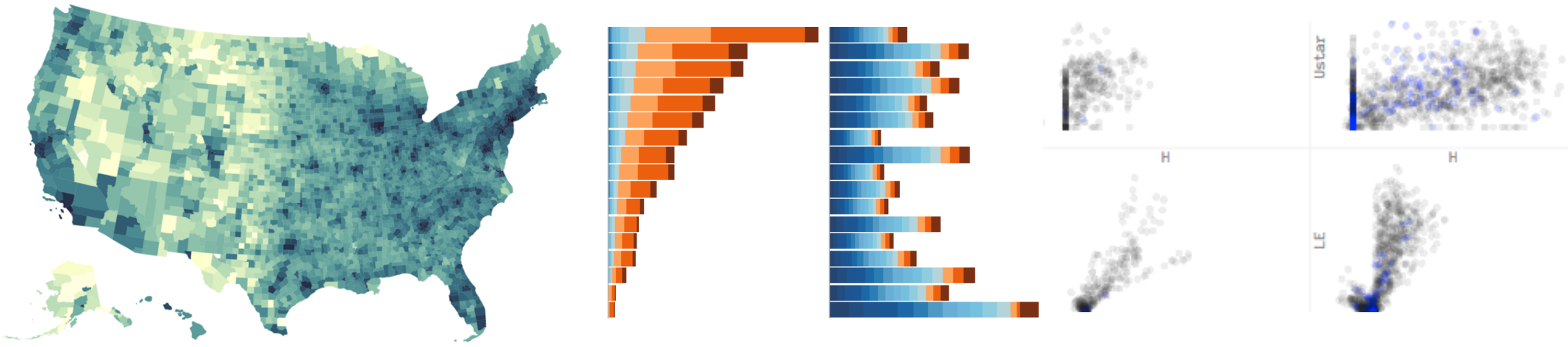


CS 526 Computer Graphics II

Texture perception & summary vision statistics

Khairi Reda | redak@uic.edu
UIC CS

Texture perception models

Original

Synthesis

Heeger and Bergen, 1995

Texture perception models

Original

Synthesis

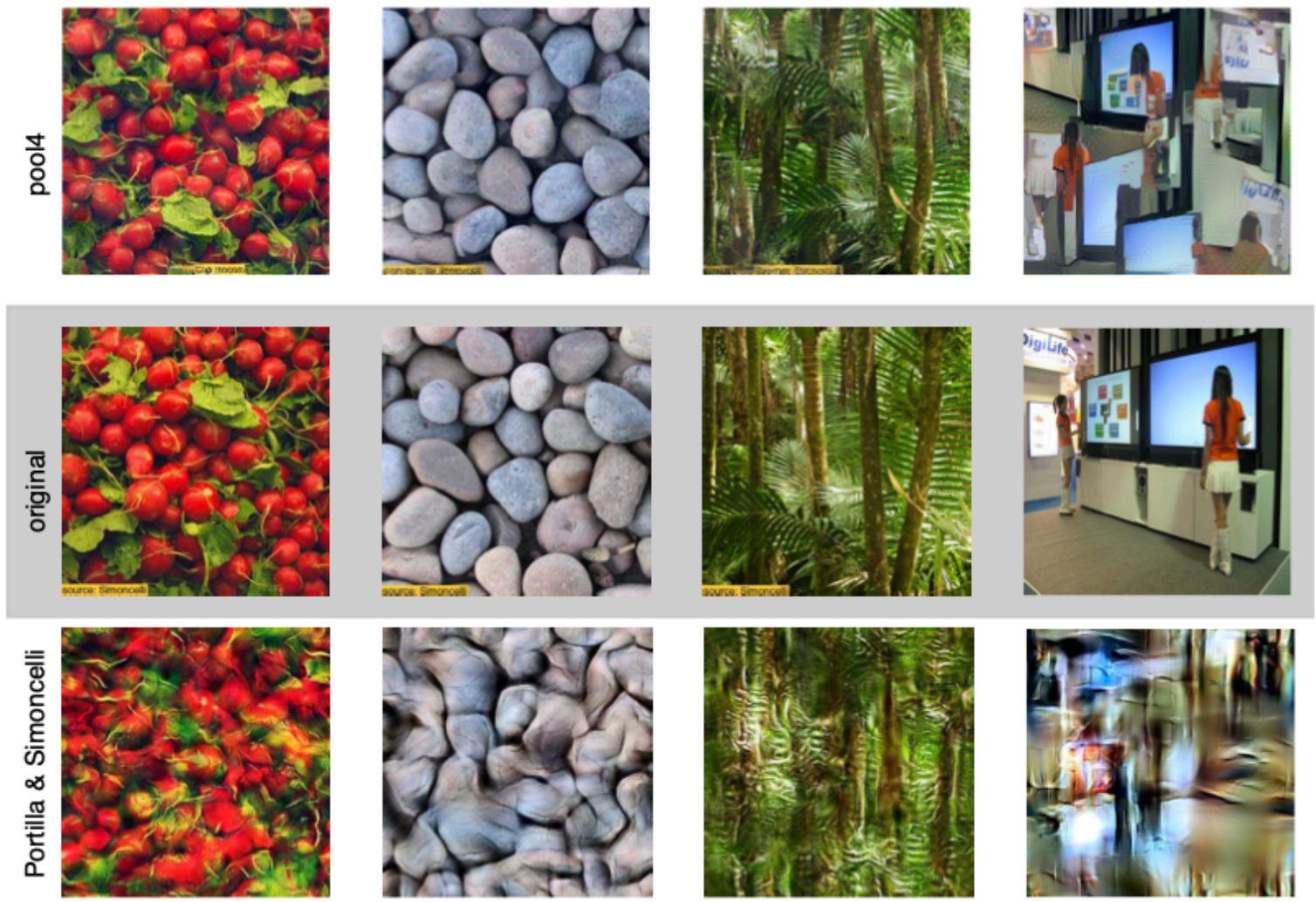
Heeger and Bergen, 1995

Original

Synthesis

Portilla and Simoncelli, 2000

Texture perception models



CNNs

Original

Portilla and Simoncelli

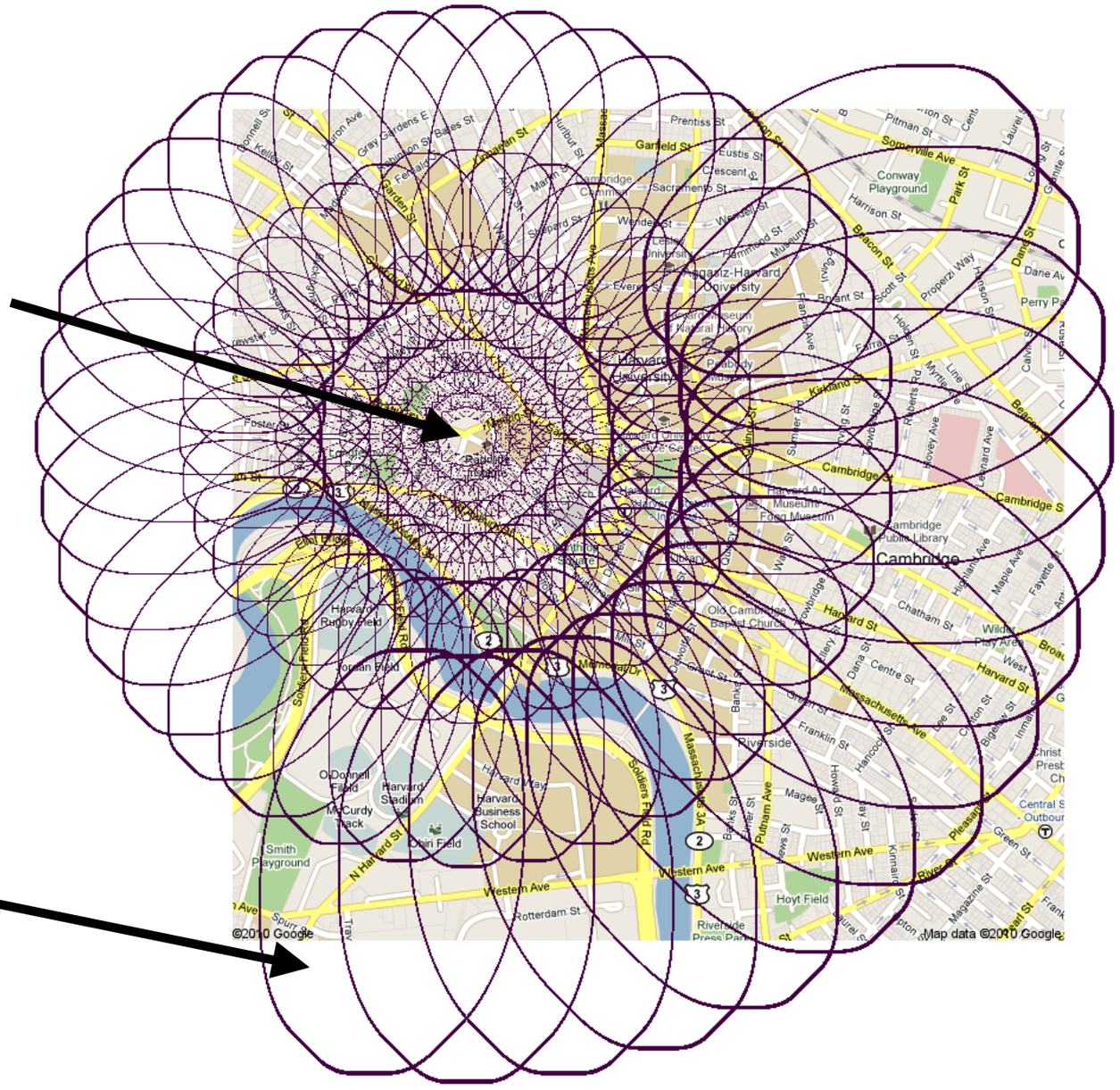
Gatys et al., 2015

The visual system as statistician

Rosenholtz et al.

High-fidelity foveal vision

Texture-like vision in the periphery



The vast majority of our vision (>90%) is peripheral

Visual crowding

Balas et al.

A + BOARD

Summary representation in peripheral vision

Rosenholtz et al.

Generate image with similar summary statistics

(~1,000 parameters)

Summary representation in peripheral vision

Rosenholtz et al.

Generate image with similar summary statistics

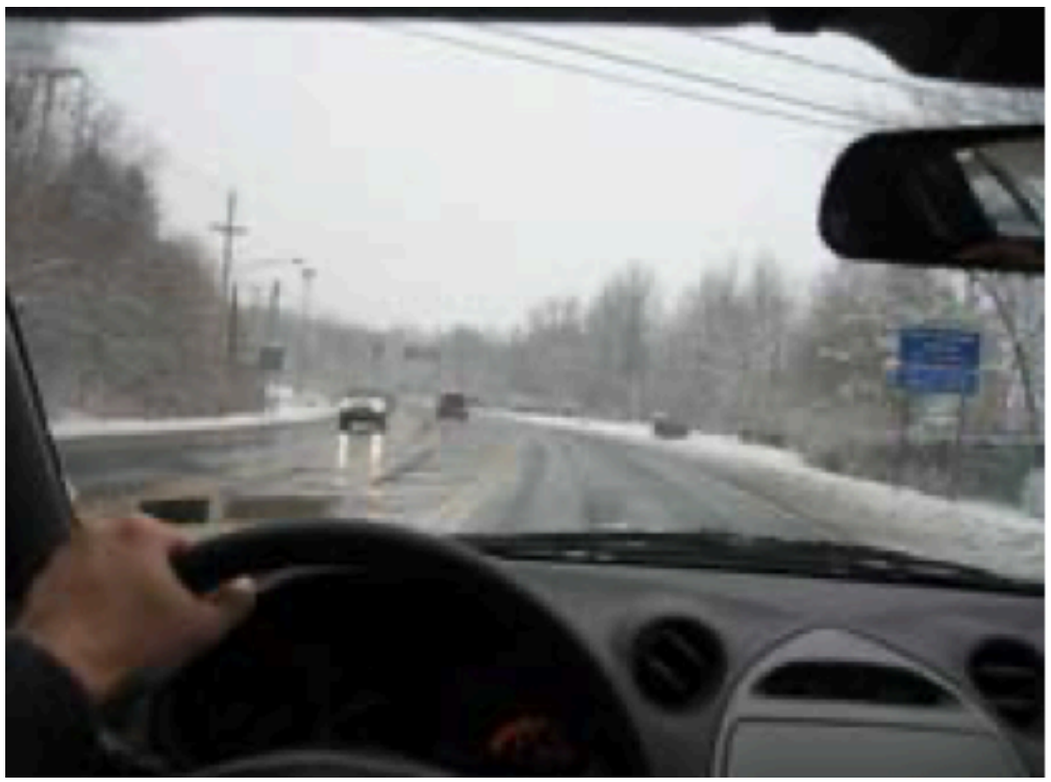
(~1,000 parameters)

Scale down image to 32x32 (1,024 parameters)

Summary representation in peripheral vision

Rosenholtz

What do you see when you're driving?



Original

Same-statistic synthesis

Summary representation in peripheral vision

Rosenholtz

What do you see when you're driving?

Original

Same-statistic synthesis

Summary representation in peripheral vision

Rosenholtz

Which subway map is better?

Original

(a)

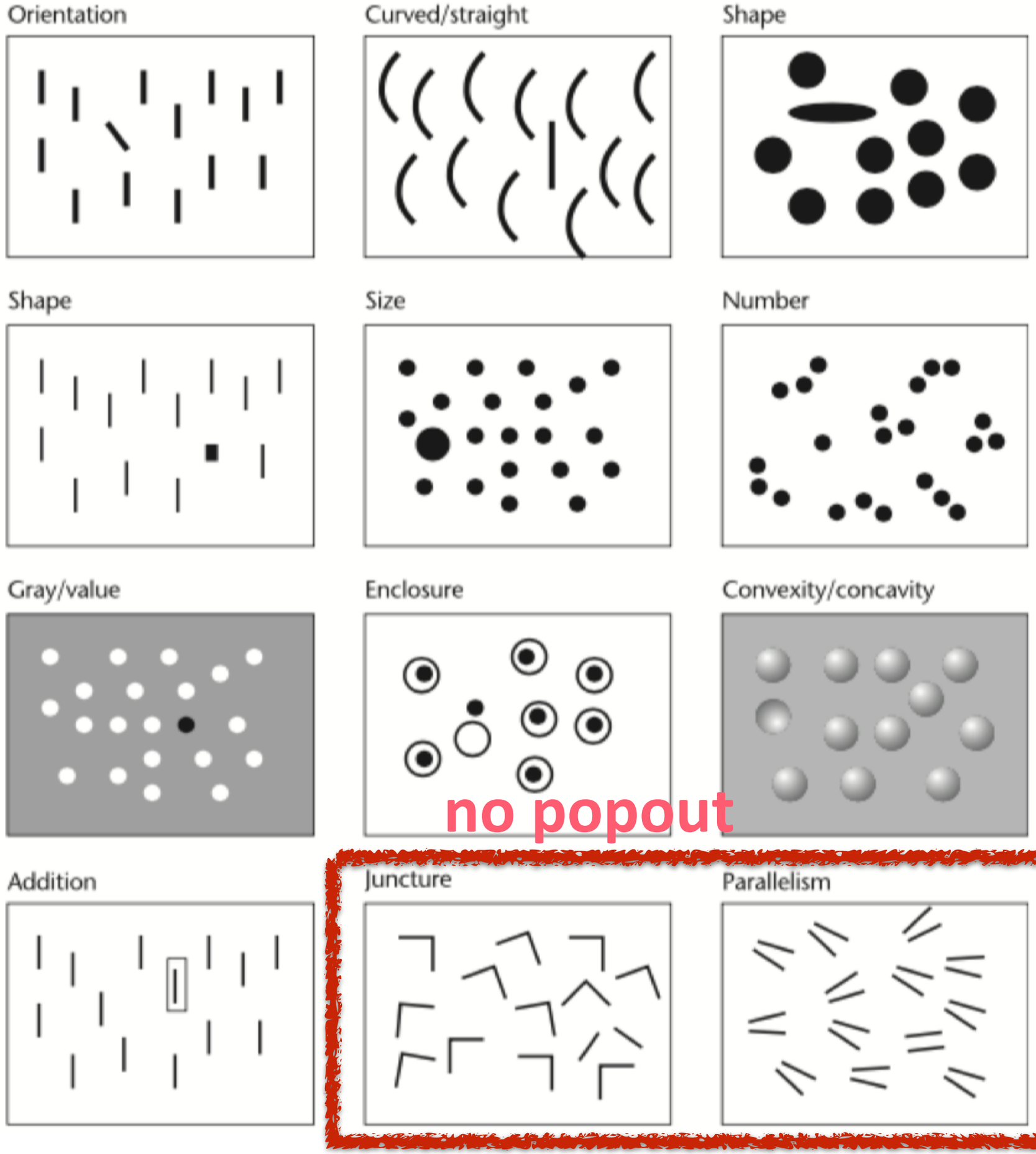
(b)

Same-statistics synthesis

(c)

(d)

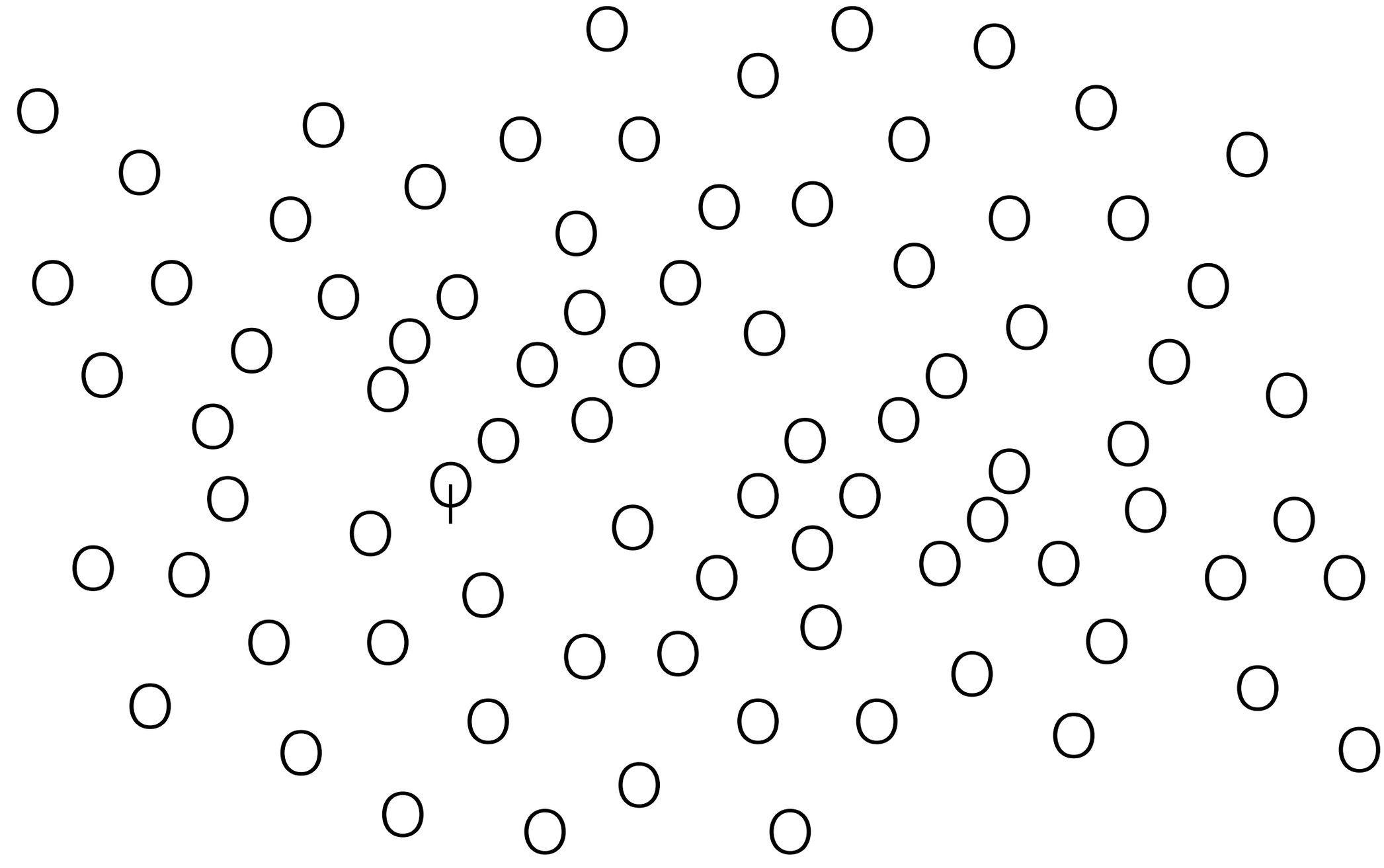
Popout channels



C. Ware
“Information Visualization”

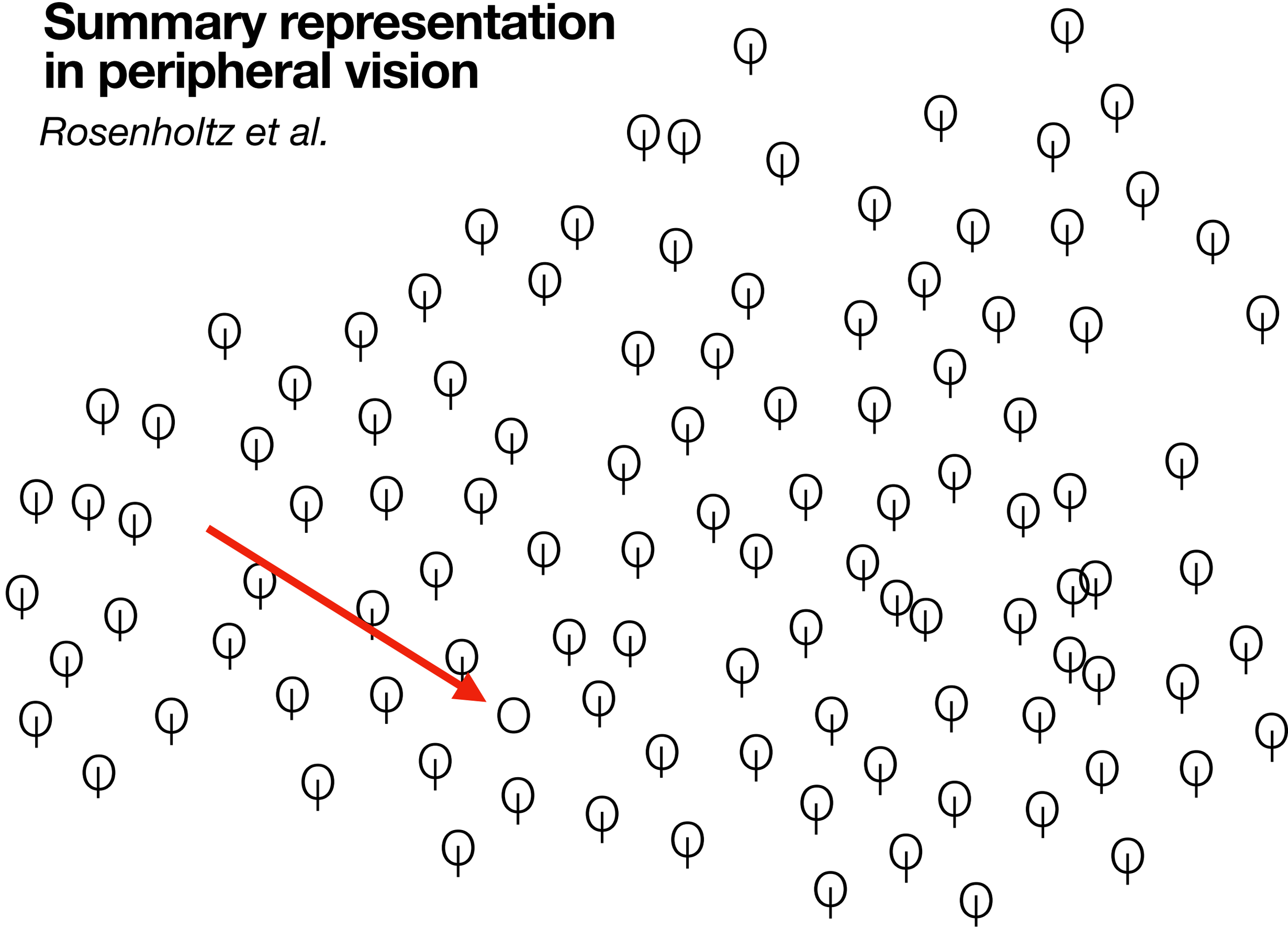
Summary representation in peripheral vision

Rosenholtz et al.



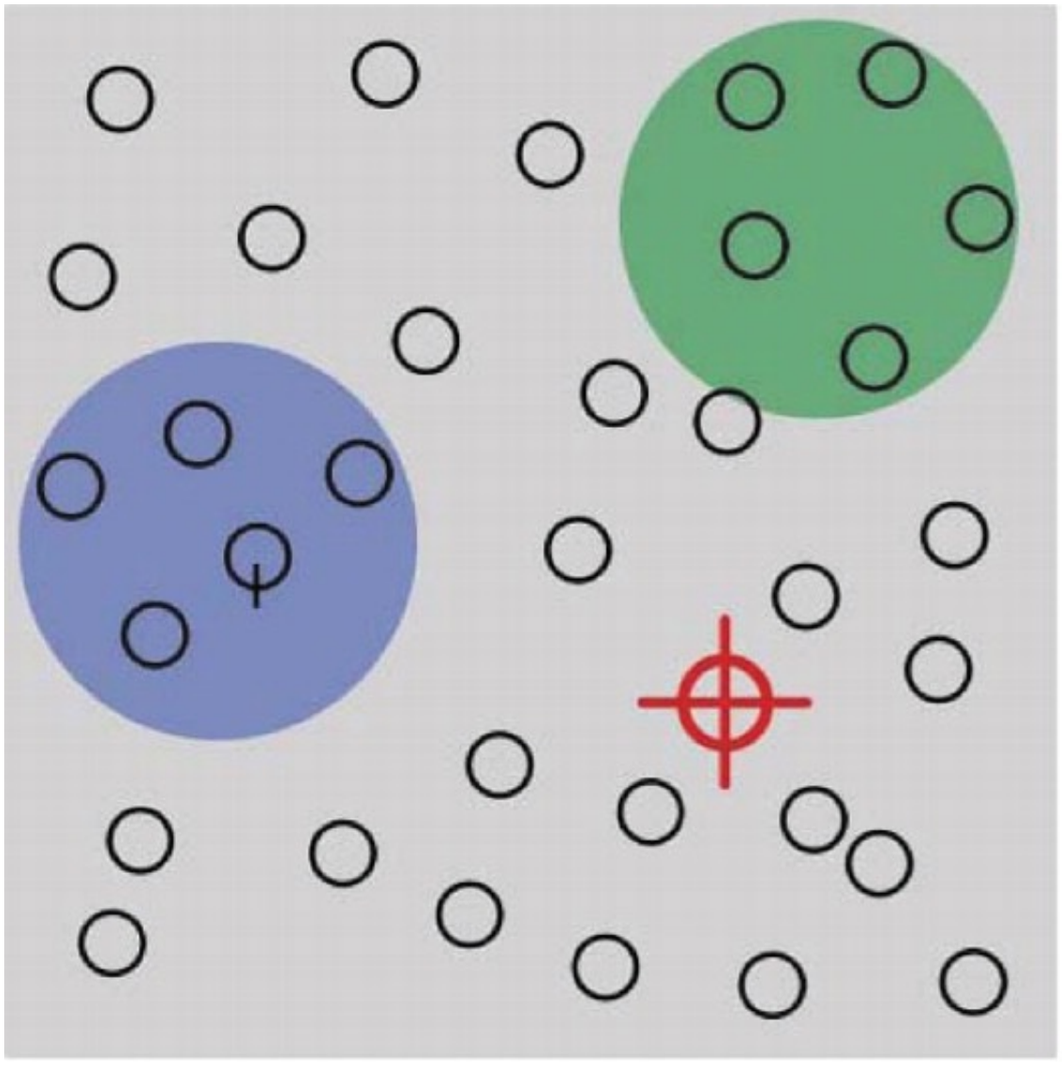
Summary representation in peripheral vision

Rosenholtz et al.



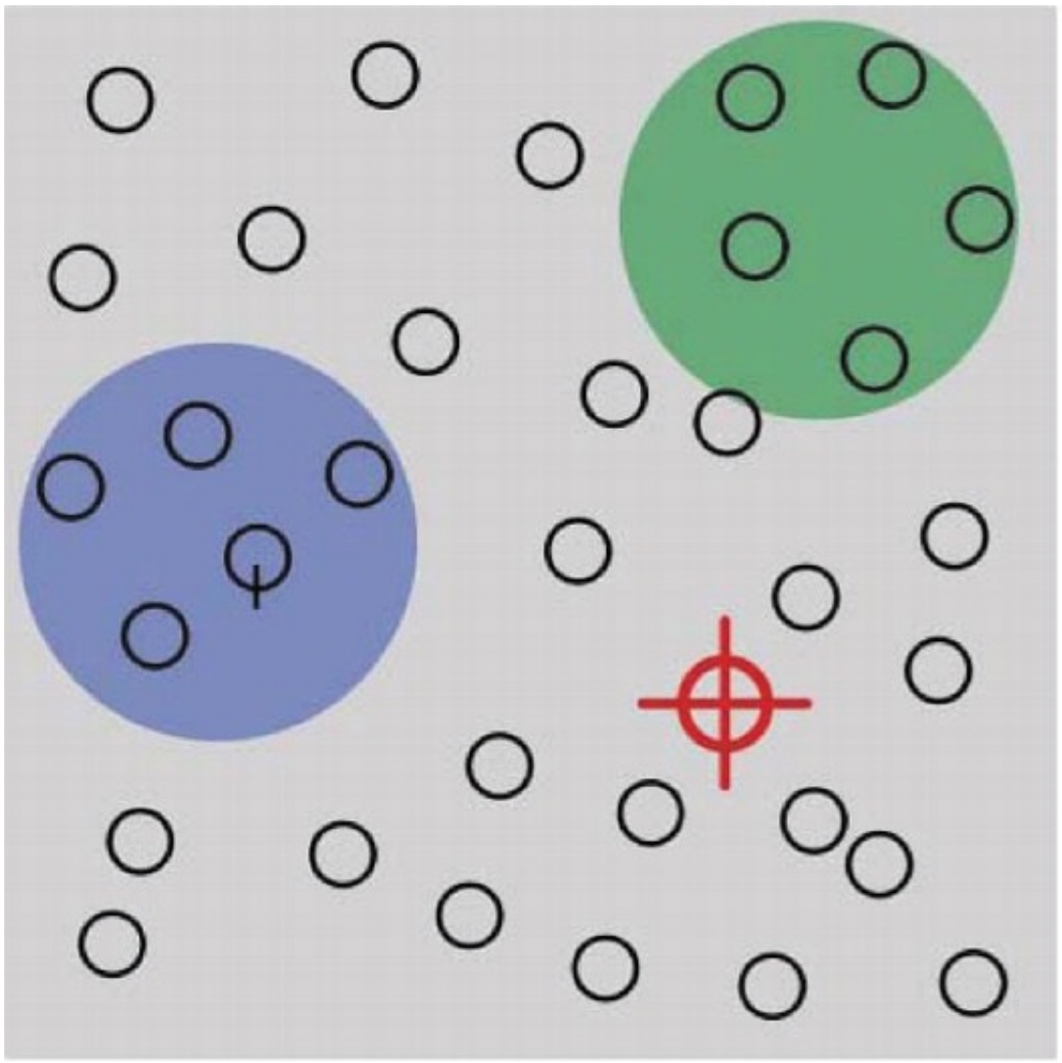
Summary representation in peripheral vision

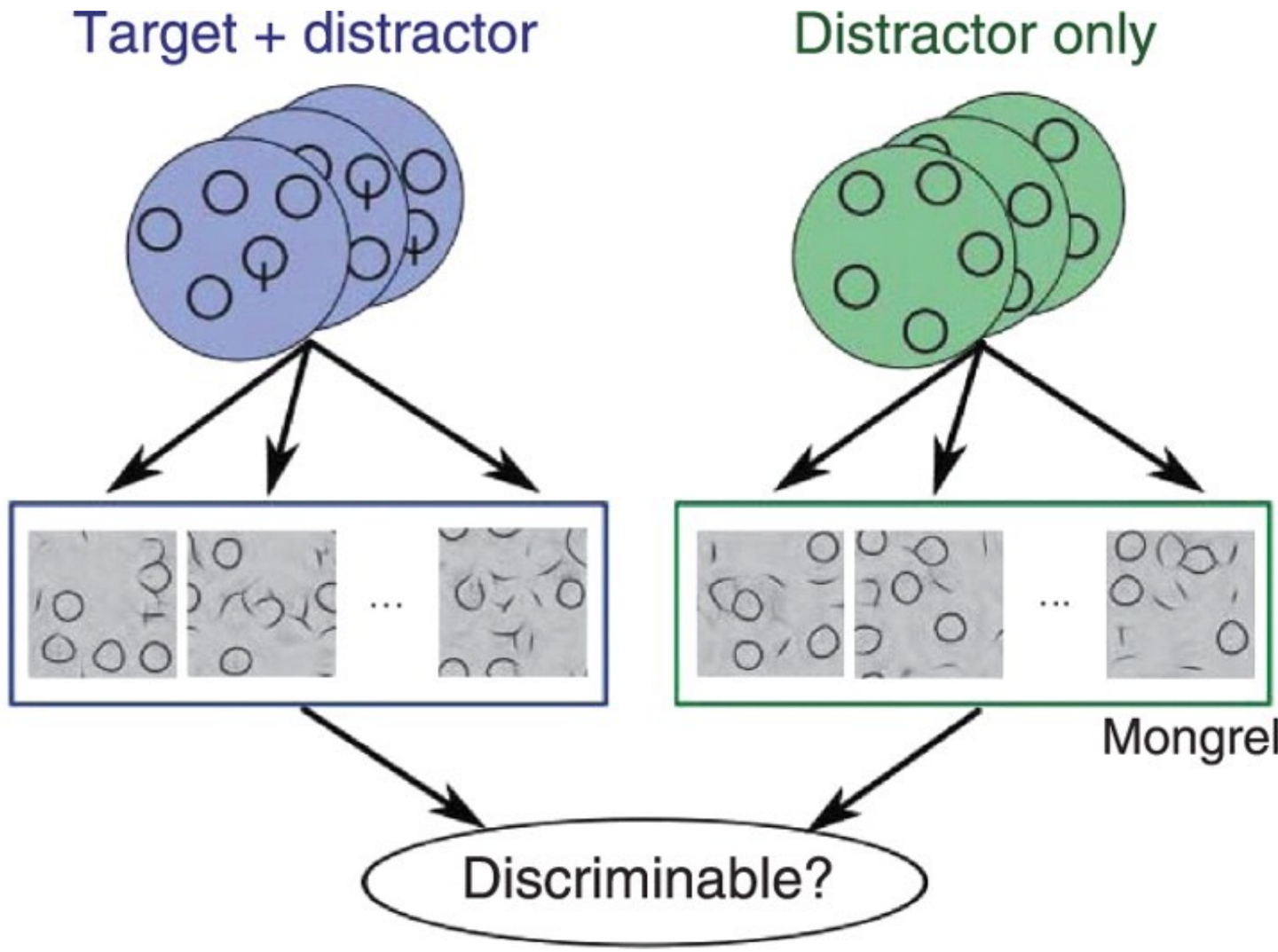
Rosenholtz et al.



Summary representation in peripheral vision

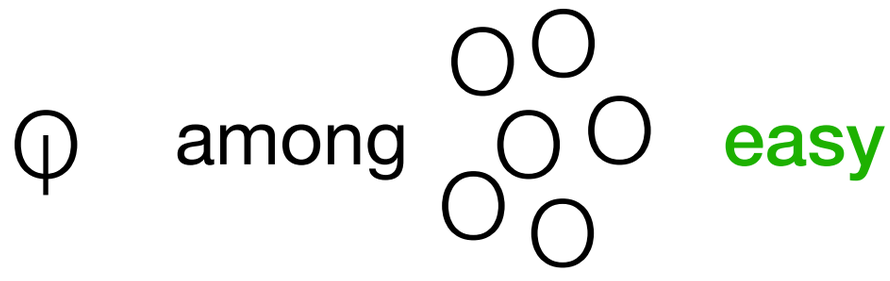
Rosenholtz et al.

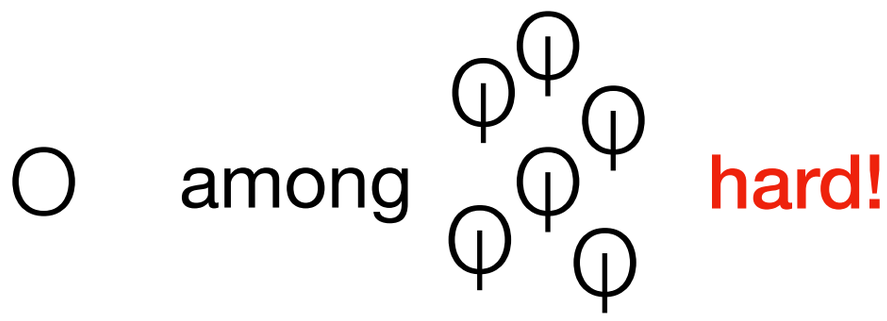




Summary representation in peripheral vision

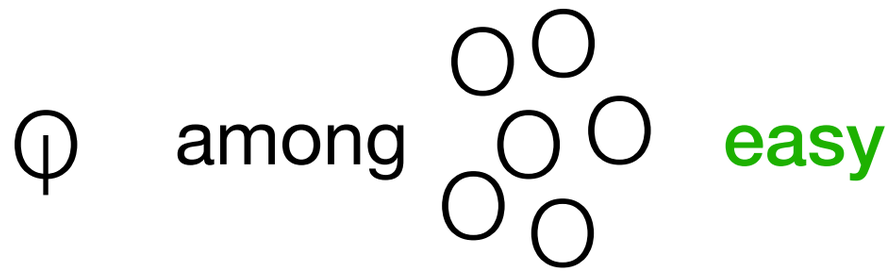
Rosenholtz et al.

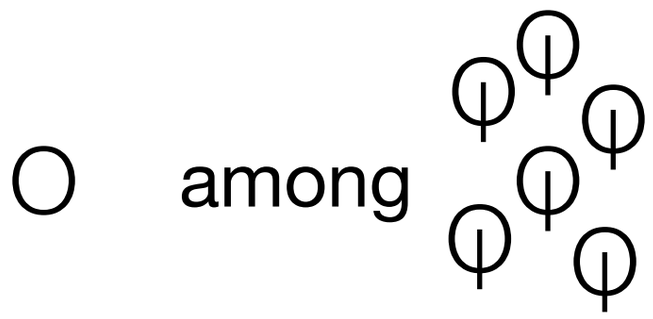


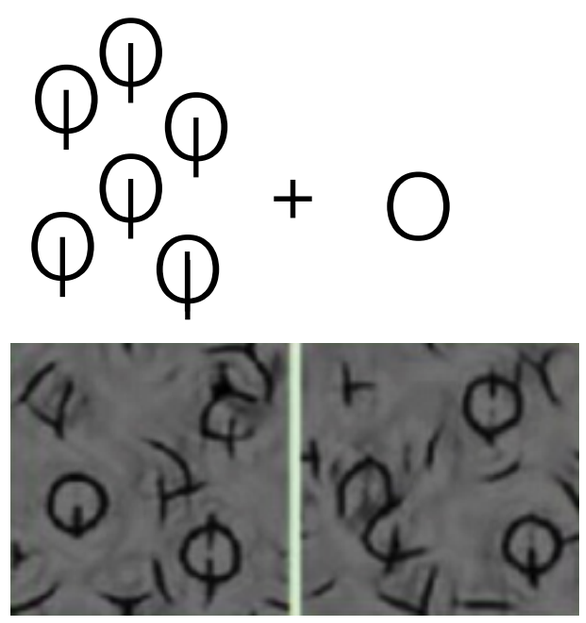


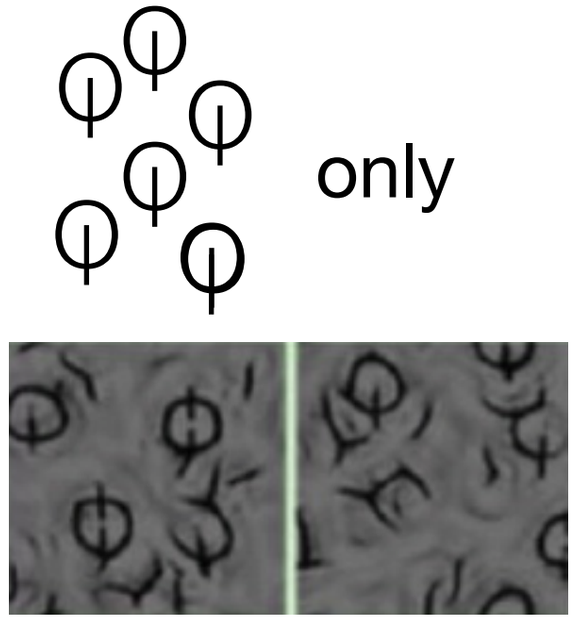
Summary representation in peripheral vision

Rosenholtz et al.









Summary representation in peripheral vision

Rosenholtz et al.