

# Intermediate-Level Visual Processing

# Visual Analysis fo Complex Scenes<sup>[1]</sup>

- Visual Context
- Experience-dependent changes in cortical circuitry
- Expectation

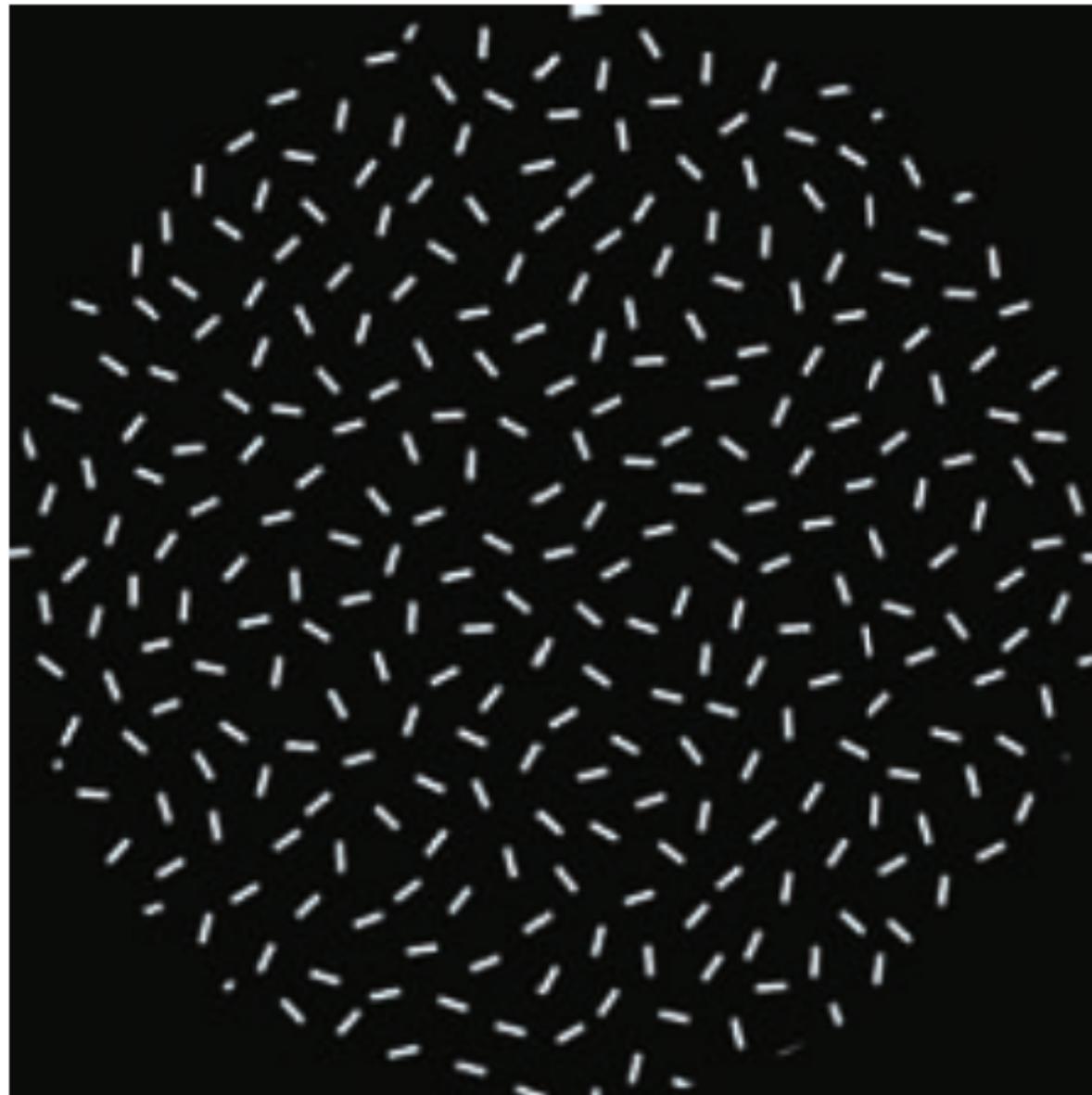
# Intermediate level Processing of Visual Primitives<sup>[1]</sup>

| Visual Primitives          | Integrated into                          |
|----------------------------|--|
| Lines                      | Object Contours                          |
| Local Contrast Information | Surface Lightness                        |
| Wavelength Selectivity     | Color Constancy and Surface Segmentation |
| Direction Selectivity      | Object Motion                            |

# Comparison of Wavelengths<sup>[1]</sup>

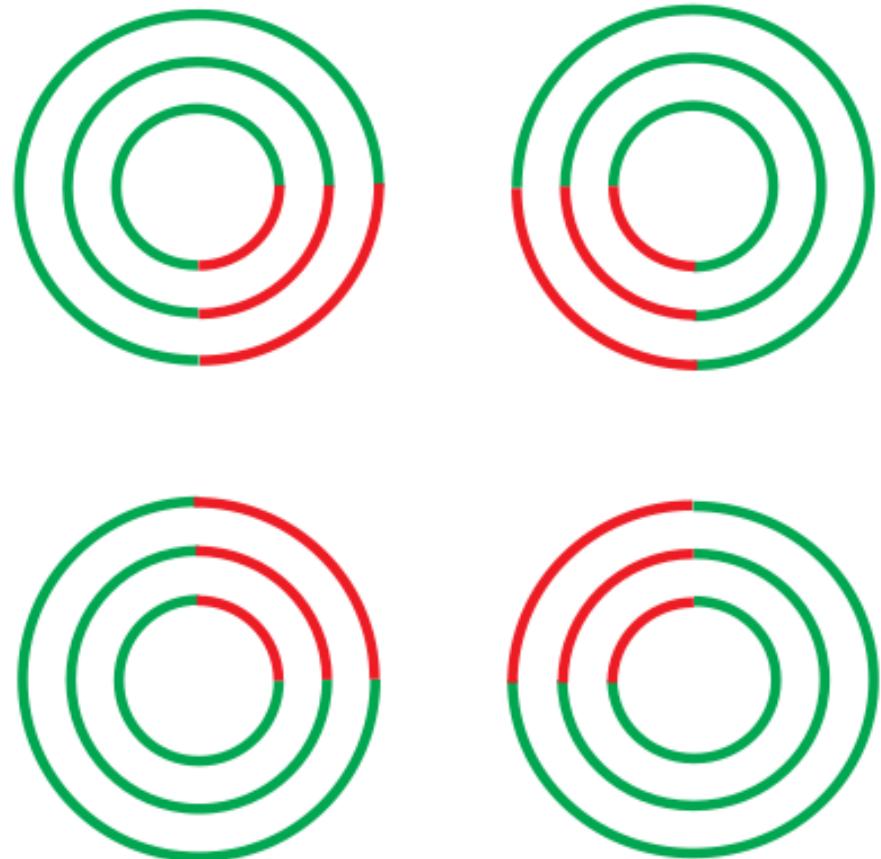


## Simple Built-in Logic to Highly Complex Problems<sup>[1]</sup>

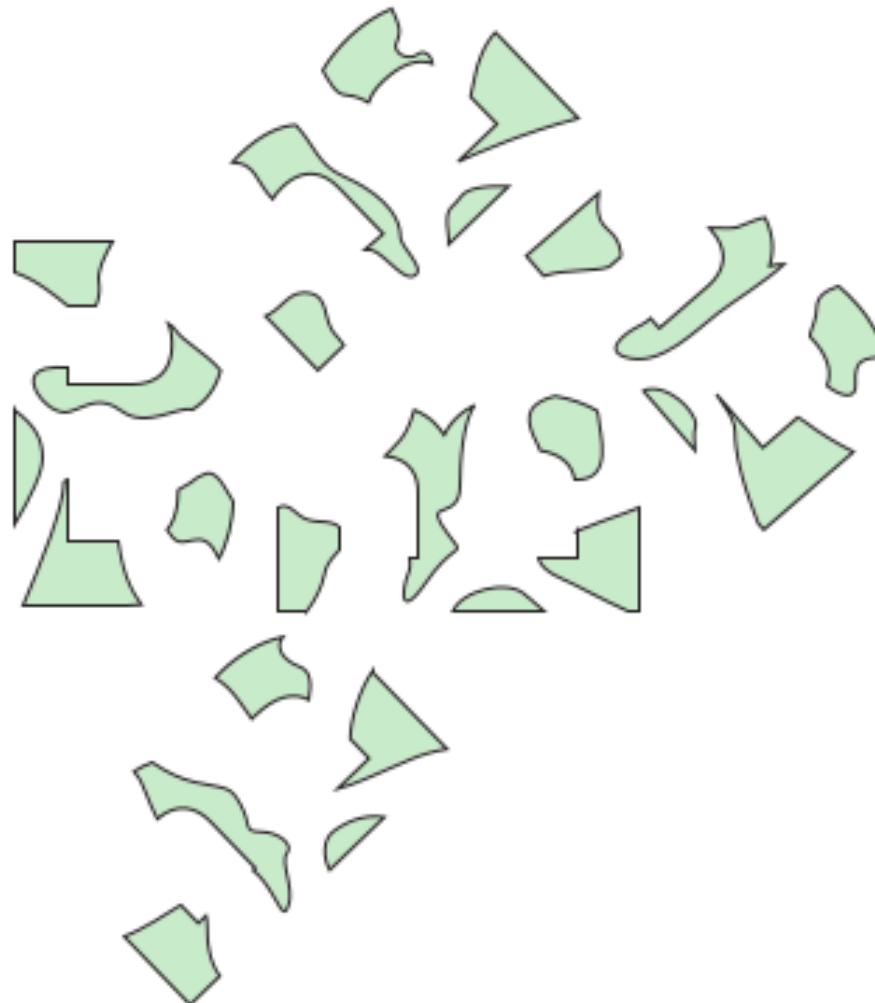


Contour Integration

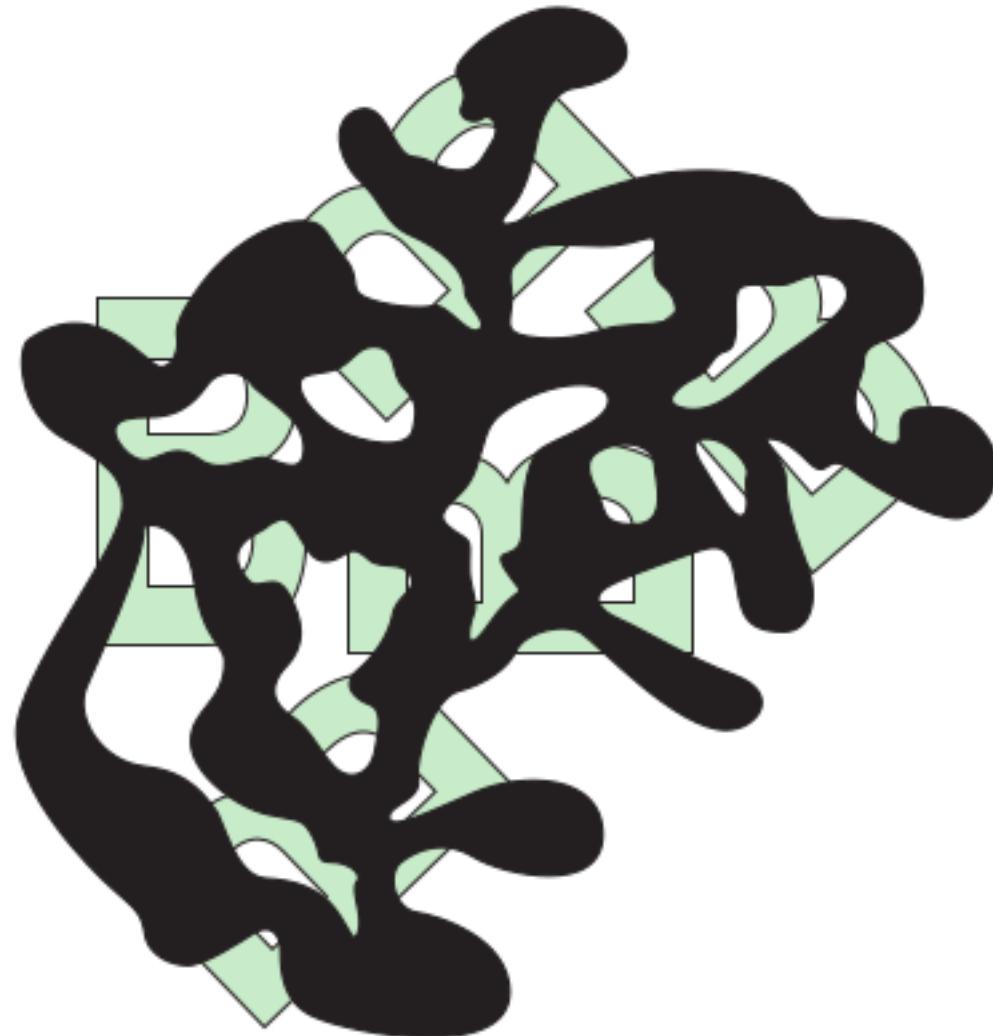
# Illusory-Contours<sup>[1]</sup>



# Context-Dependent Response<sup>[1]</sup>

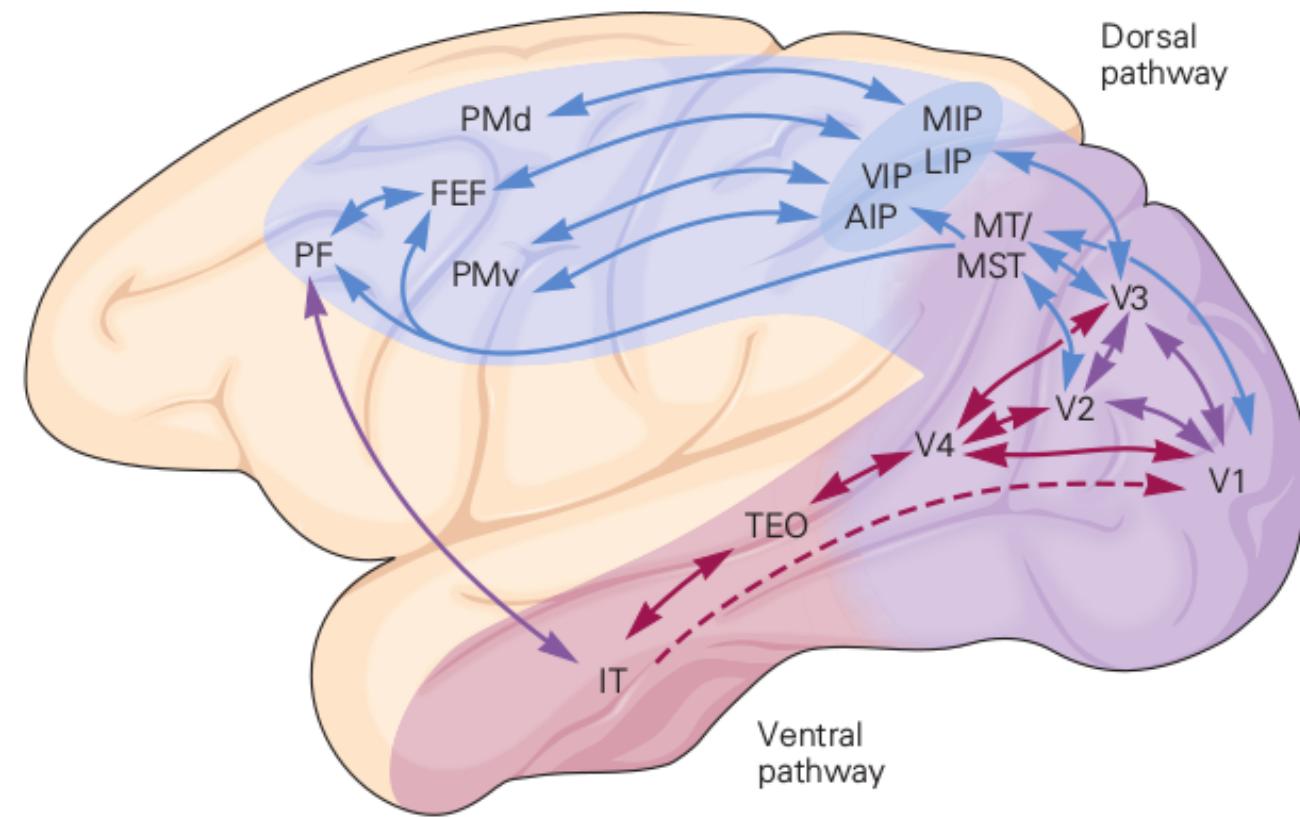


# Context-Dependent Response (Perceptual fill-in)<sup>[1]</sup>



Can Machine Learning or any mathematical modeling identify optical illusions?<sup>□</sup>

# Visual Cortex<sup>[1]</sup>



|    |   |
|----|---|
| V1 | Contour Integration,<br>Surface Segmentation              |
| V2 | Object Surfaces   |
| V4 | Integrates information<br>about color and object<br>shape |
| V5 | Integration of motion<br>signals across space             |

# Transient Stimulation



# References

1. Siegelbaum, Steven A., and A. J. Hudspeth. Principles of neural science. Eds. Eric R. Kandel, James H. Schwartz, and Thomas M. Jessell. Vol. 4. New York: McGraw-hill, 2000.