

# Hebbian Learning and Computer Vision

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# Problems in Computer Vision

- Understanding object boundaries
- Keeping Track of Object Mutation
- Rough image transition

# Rotation and Dilation

- Centering Problem
- Middle Temporal & Medial Superior Temporal Neurons
- Previous Solutions
- Sereno & Sereno
  - Hebbian Solution

# A note on Anti-Hebb

- Similar to Hebbian Learning
- Fire Together, Drift Apart

# Curve and Surface

- Engineering and Computer Vision
- Least Square
- Total Least Square
- Learning the TLS rule - NTLs
- Noise Resistance

# Visual Stability

- Robot External Motion
- Spacial and Visual Movement
- Reflex Training
- Motor stabilization through output

# Resources

- Sereno, Sereno, and Zhang. (1993). Emergence of Position Independent Sensors[...]. *Neural Computation*. Vol 5.
- Xu, Oja, and Suen. (1992). Modified Hebbian Learning for Curve and Surface Fitting. *Neural Networks*. Vol 5.
- Panerai, Metta, and Sandini. (2002). Learning Visual Stabilization Reflexes in Robots with Moving Eyes. *Neurocomputing*. Vol 48.