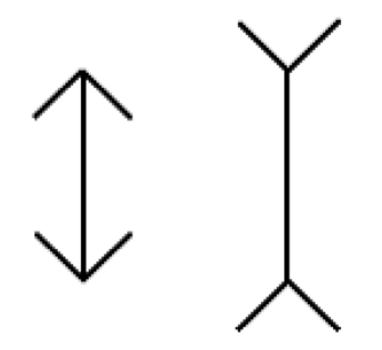
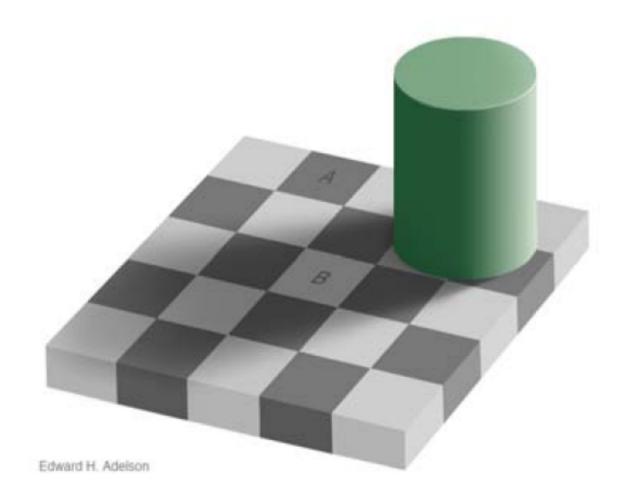
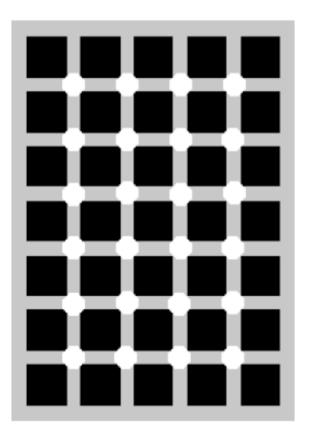
What can optical illusions tell us about human vision?



[Figures from Szeliski]





Х	Х	Х	Х	Х	Х	Х	0	Х	0	Х	0	Х	Х
Х	Х	Х	Х	Х	Х	Х	Х	0	Х	Х	Х	0	Х
Х	Х	Х	Х	Х	Х	Х	0	Х	Х	0	Х	Х	0
Х	Х	Х	Х	Х	Х	Х	Х	Х	0	Х	0	0	Х
Х	Х	Х	Х	Х	Х	Х	0	Х	Х	0	Х	Х	Х
Х	Х	Х	Х	Х	Х	Х	Х	0	Х	Х	Х	0	Х
Х	Х	Х	Х	Х	Х	Х	0	Х	Х	0	Х	Х	0
Х	Х	Х	Х	Х	Х	Х	Х	0	Х	Х	Х	0	Х
Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	0	0	Х	Х
Х	Х	Х	Х	Х	Х	Х	Х	0	Х	Х	Х	0	Х

Historical timeline

1970	1980	1990	2000		
Digital image processing Blocks world, line labeling Generalized cylinders Pictorial structures Stereo correspondence Intrinsic images Optical flow	Structure from motion Image pyramids Scale-space processing Shape from shading, texture, and focus Physically-based modeling Regularization Markov Random Fields	A a man niters 3D range data processing Projective invariants Factorization Physics-based vision Graph cuts Particle filtering Energy-based segmentation	Face recognition and detection Subspace methods Image-based modeling and rendering and rendering Texture synthesis and inpainting Computational photography Feature-based recognition MRF inference algorithms Category recognition Learning		

Two perspectives

Inverse problem: Understand the properties of the world, given observed images (insufficient information to specify fully)

Physics-based models (forward approach)

Statistical modelling / Machine learning (backward approach)

Starting from known laws and primitives, how can we explain our observations? What kinds of objects and conditions are compatible with them? Infer the state of the world probabilistically, based on observations; model and estimate (from training data) the probability distribution of the former given the latter

