Computer Vision

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Early Days

Developed on MIT’s TX-2 computer, with 64k words of memory

(a) Original picture.
(b) Computer display of picture (reflected by mistake).
(c) Differentiated picture.
(d) Feature points selected.

Larry Roberts (MIT), 1963
Recent Successes
Success: 3D from Tourist Photos

Agarwal, Furukawa, Snavely, Simon, Seitz, Szeliski
(U. of Washington, Cornell, Microsoft), 2009
Success: Detailed Reconstruction

When we can pick and choose photos.
Goesele, Snavely, Curless, Hoppe, Seitz
(U. of Washington, Microsoft), 2009
Recognition is Hard

From Grauman & Leibe, AAAI 2008
Challenge 1: view point variation
Challenge 2: illumination

Slide credit: S. Ullman

Slide by Li, Fergus, Torralba, CVPR 2007
Challenge 3: occlusion

Magritte, 1957
Challenge 4: scale

Slide by Li, Fergus, Torralba, CVPR 2007
Challenge 5: deformation

Slide by Li, Fergus, Torralba, CVPR 2007

Xu, Beihong 1943
Challenge 6: background clutter

Klimt, 1913
Challenge 7: intra-class variation
Success: Digit Recognition

LeCun, Bottou, Bengio, Haffner
(New York U.), 1998
Near Success: Face Recognition

Apple iPhoto, 2009

Picture by Wilson Rothman, Gizmodo
Successes in the Works?

The importance of data...