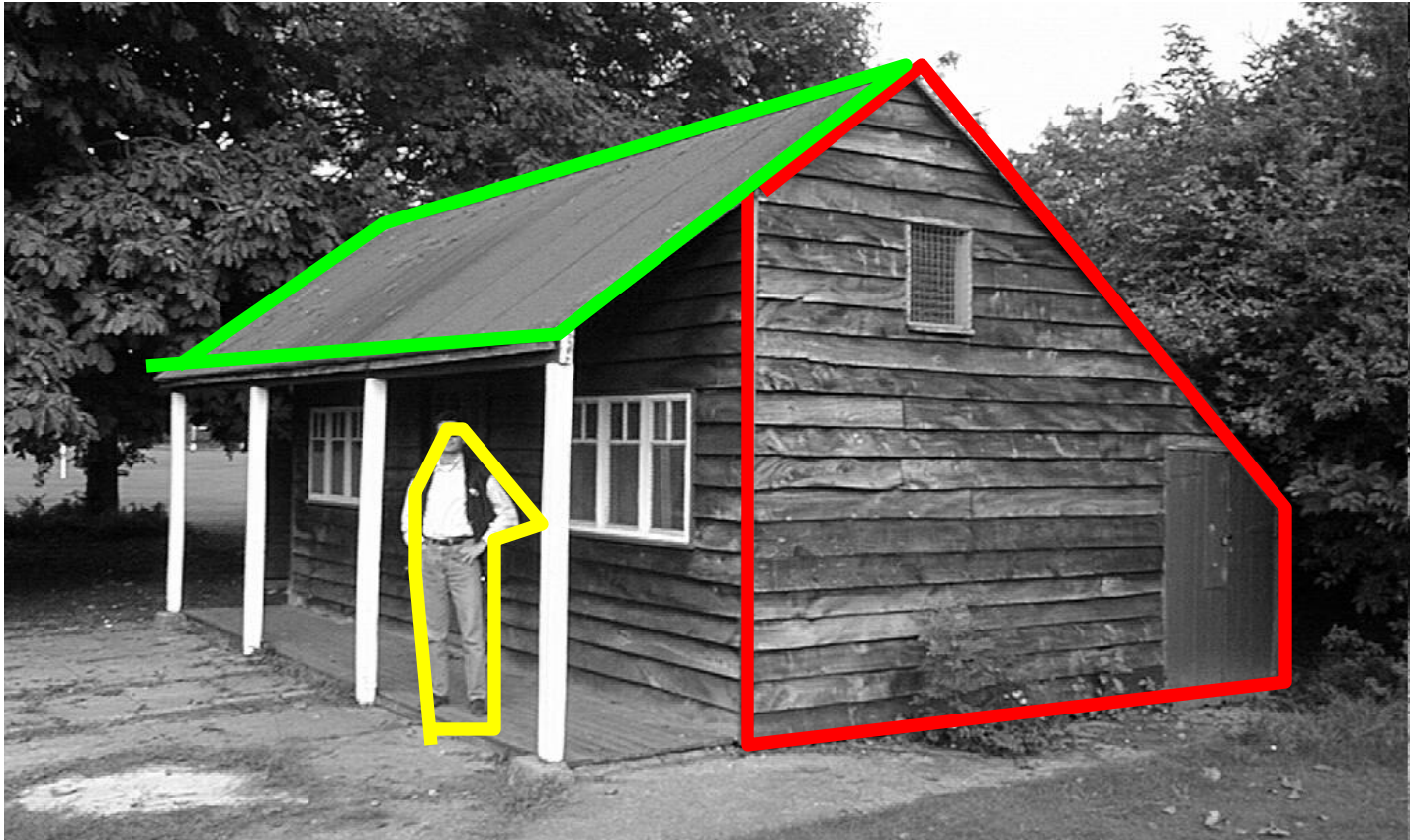




<http://www.robots.ox.ac.uk/~vgg/projects/SingleView/models/hut/hutme.wrl>

Single view reconstruction - drawbacks

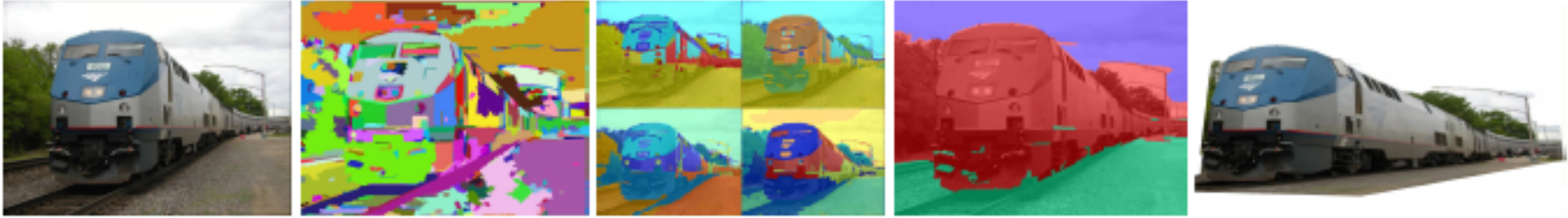


Manually select:

- Vanishing points and lines;
- Planar surfaces;
- Occluding boundaries;
- Etc..

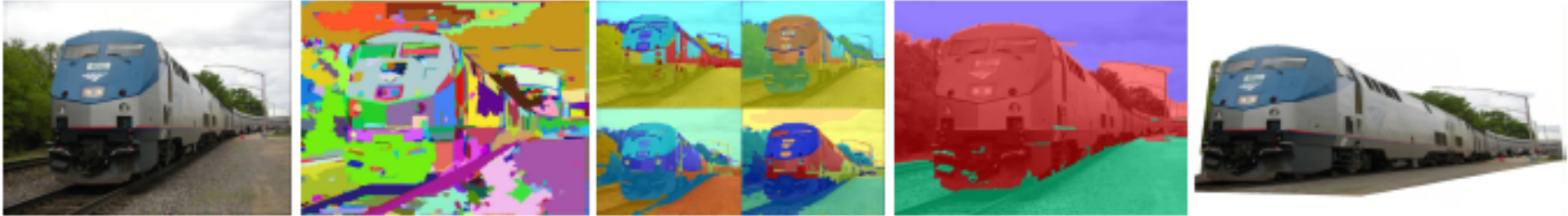
Automatic Photo Pop-up

Hoiem et al, 05



Automatic Photo Pop-up

Hoiem et al, 05...



Automatic Photo Pop-up

Hoiem et al, 05...



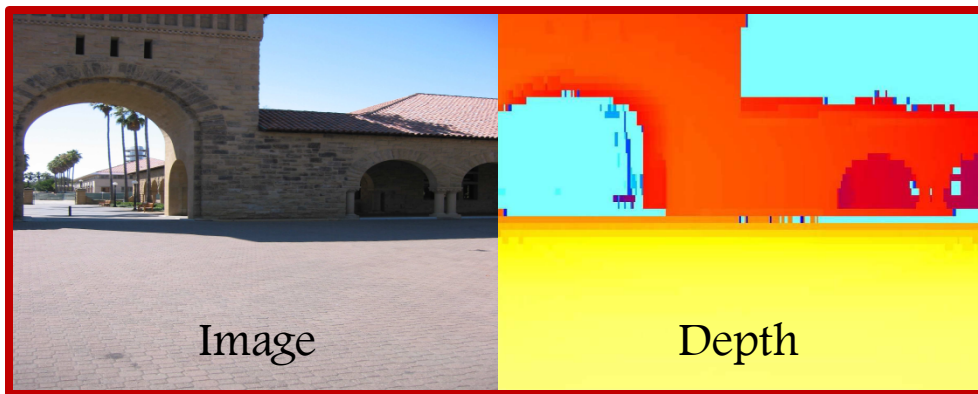
Software:

<http://www.cs.uiuc.edu/homes/dhoiem/projects/software.html>

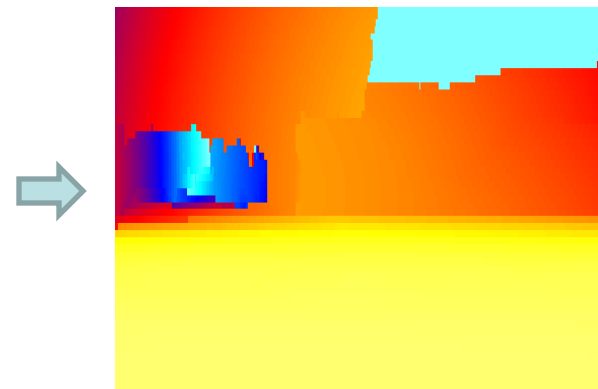
Make3D

Saxena, Sun, Ng, 05...

Training

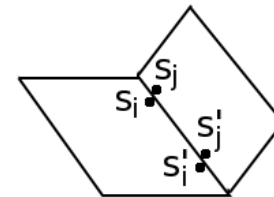


Prediction



Plane Parameter MRF

$$P(\alpha|X, \nu, y, R; \theta) = \frac{1}{Z} \prod_i f_1(\alpha_i|X_i, \nu_i, R_i; \theta) \prod_{i,j} f_2(\alpha_i, \alpha_j|y_{ij}, R_i, R_j)$$



(a)
Connectivity



(b)
Co-Planarity

Make3D

Saxena, Sun, Ng, 05...



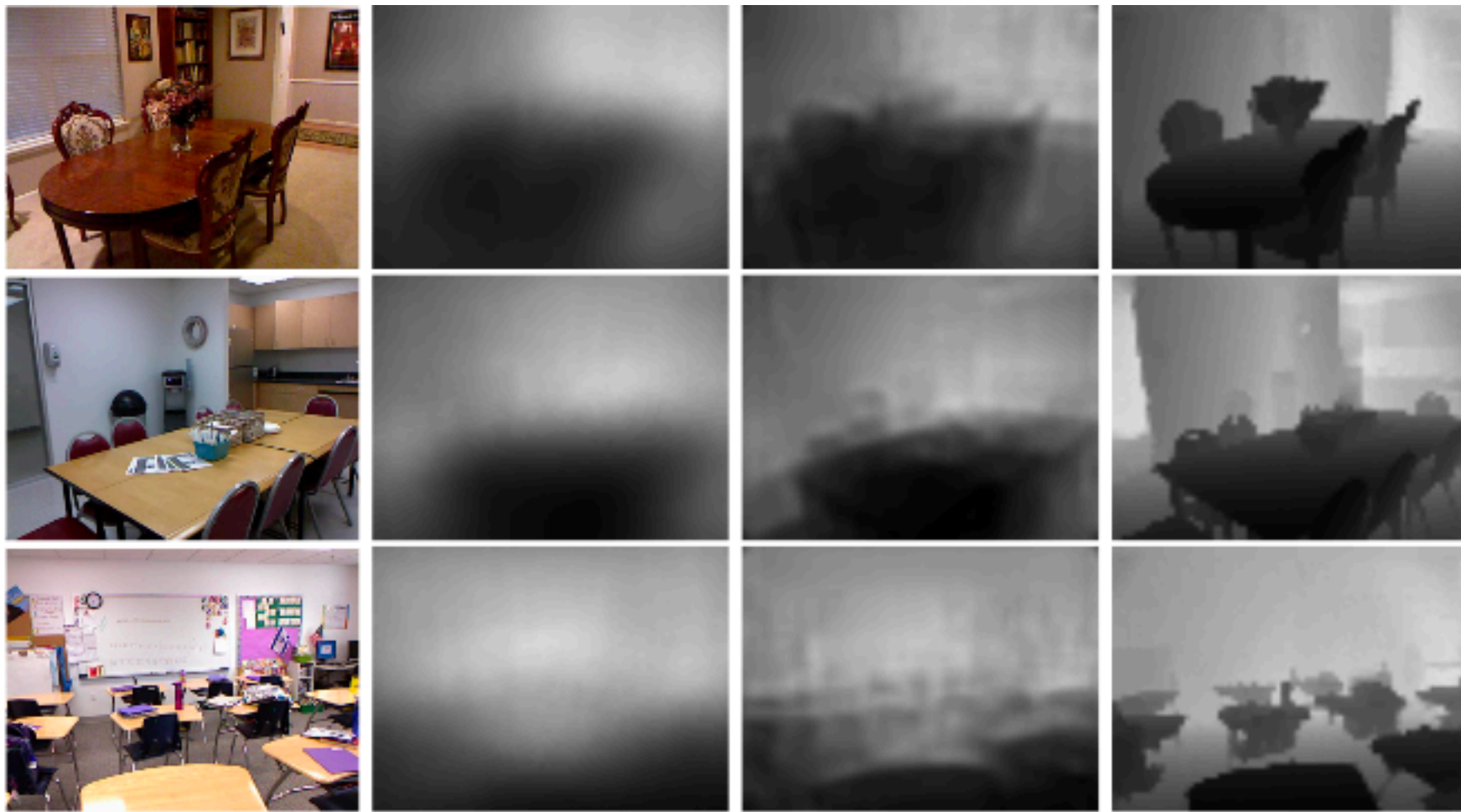
A software: **Make3D**
“Convert your image into 3d model”

<http://make3d.stanford.edu/>

<http://make3d.cs.cornell.edu/>

Depth map reconstruction using deep learning

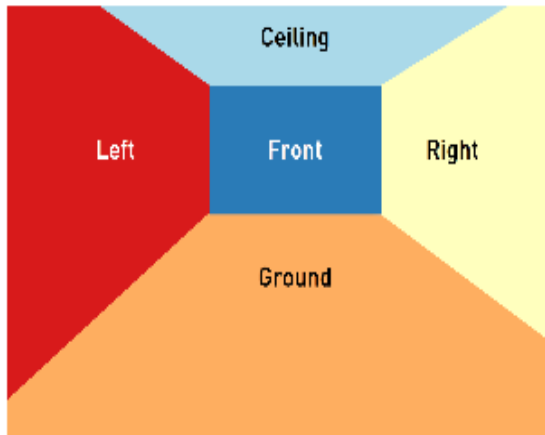
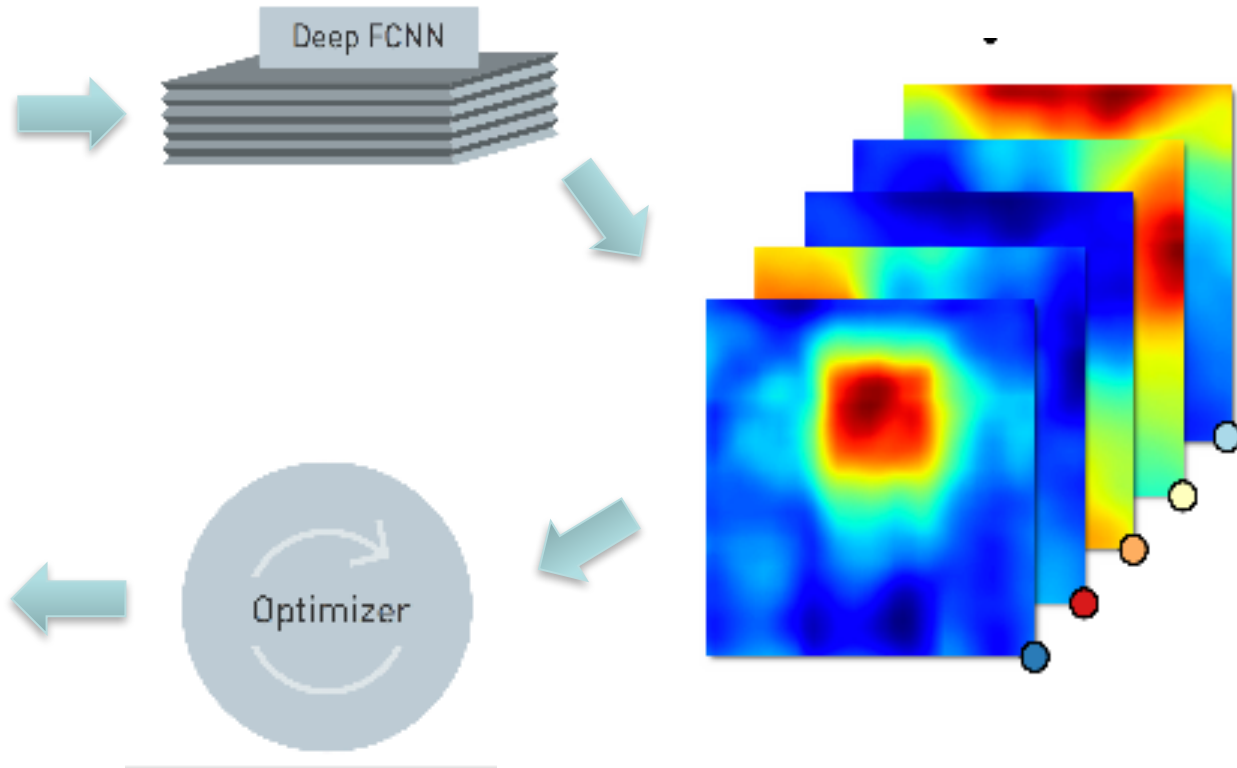
Eigen et al., 2014



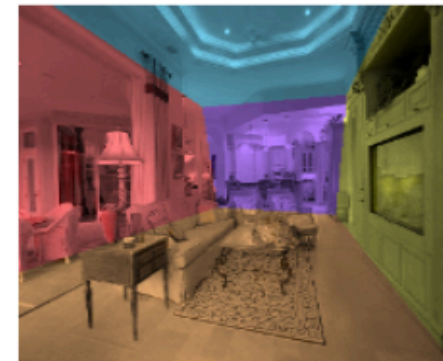
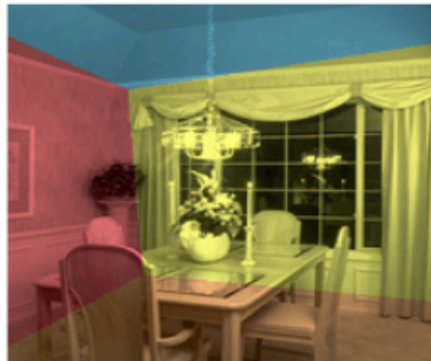
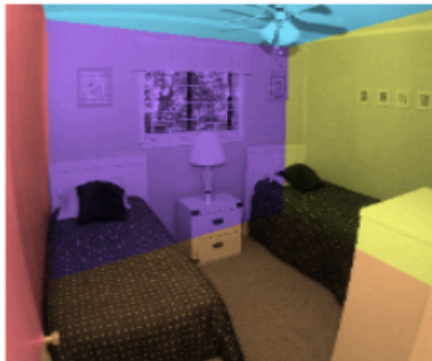
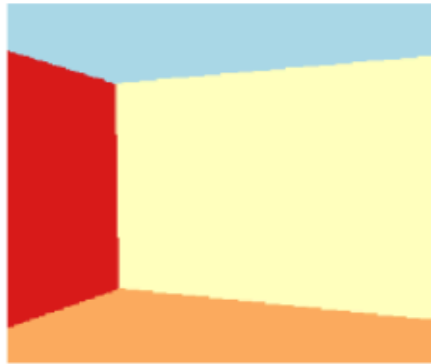
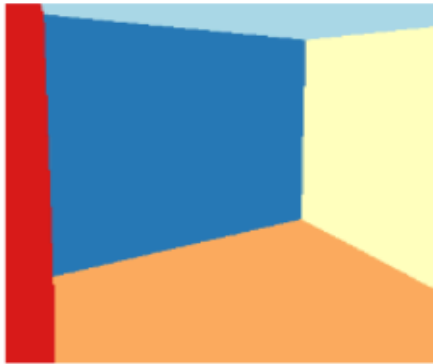
Depth Map Prediction from a Single Image using a Multi-Scale Deep Network,
Eigen, D., Puhrsch, C. and Fergus, R. Proc. Neural Information Processing Systems 2014,

3D Layout estimation

Dasgupta, et al. CVPR 2016



3D Layout estimation



Coherent object detection and scene layout estimation from a single image

Y. Bao, M. Sun, S. Savarese, CVPR 2010, BMVC 2010

