Perception, tracking, registration

- Joshua Blackburn, Dan Kubacki, John Stratton
  - Integrate depth camera with color camera
- Erik Kroeker
  - Track gaze using stereo pair and third camera
- Pedro Crisostomo, Kevin Karsch, Max Katsev
  - Single image albedo and shading decomposition (3)
- Jin Tae Kwak
  - Register microscopic and spectroscopic images
- Po-Sen Huang, Victor Lu
  - “Pixels that sound” implementation, review, evaluation (4)
Learned image decomposition

\[ E(\theta) = \sum_{i \in \text{examples}} (V - V^*)^2 + \lambda_1 (I(V) - I(V^*))^2 + \lambda_2 (P(I(V)) - V^*)^2 \]

Diffuse, shading, albedo, specular decomposition

Shadow removal

Preliminary results

Current result

Original

Ground truth
Pixels that Sound

- Canonical Correlation Analysis
- Sparse, solve $Vw = a$ by L1 minimization

Detected correlated pixels

Kidron, Schechner, Elad, *Pixels that Sound*
Related to Object Recognition

• Micah Hodosh and Sebastian Schiessl
  – Text recognition in natural images (6)

• Charles Spuckler
  – Survey object recognition methods from VOC PASCAL and evaluate one
Related to Multiview 3D Reconstruction

• Huiguang Yang
  – General

• Dean Glazeski, Pahwa Ramanpreet, Wee Hong Yeo
  – 3D reconstruction from two views + augmented reality

• Huy Bui and Yiyi Huang
  – general

• Victor Wu, Devin Bonnie, Aaron Silver
  – calibration of stereo cameras to get 3D view, working with Berkeley Tele-immersion system

• Shengnan Wang
  – Stereo estimation from pairs of image
Other Applications

• Seungho Lee, Hyongju Park, Junho Yang
  – Detect edges in hallway and use edge detections to choose robot path (9)

• Qieyun Dai, Ruiqi Guo, Zhida Xu, Xiao Bao
  – Image dehazing: implement and compare multiple methods to remove haze from images

• Andre Luiz Nunes Targino da Costa
  • Jointly estimating shape and segmentation
Seungho Lee, Hyongju Park, Junho Yang

- Detect edges in hallway and use edge detections to choose robot path.