Tutorial at CVPR 2010
8:30 – 12:30 on June 18, 2010

Scene Reconstruction from Community Photo Collections

Michael Goesele, TU Darmstadt
Hendrik P.A. Lensch, Universität Ulm
Noah Snavely, Cornell University
4.701.579.612th image uploaded onto Flickr by theanthracite on June 15, 2010
5 billion images
~ # images uploaded on Flickr
Community Photo Collections

user-contributed online image collections available from Flickr and other similar sites
The Internet as Source of Input Data

Real World
Example: Scene Completion

Input image → Scene Descriptor → Image Collection (2.3 million images)

20 completions → Context matching + blending → 200 matches

Scene Completion Using Millions of Photographs.
Hays, Efros. SIGGRAPH 2007
Example: Camera Calibration

Jason Salavon, www.salavon.com
Example: Camera Calibration

(a) (b) (c) (d)

(e) (f)

Priors for Large Photo Collections and What they Reveal about Cameras
Kuthirummal, Agarwala, Goldman, Nayar. ECCV 2008
Example: Scene Summarization

Scene Summarization for Online Image Collections.
Simon, Snavely, Seitz. ICCV 2007
Example: Story Illustration

- illustrate a text using images from Flickr

Three blind mice. Three blind mice.

See how they run. See how they run.

They all run after the farmer’s wife.

Who cut off their tails with a carving knife.

Did you ever see such a sight in your life.

As three blind mice.

[Schwarz et al., KES Workshop, 2010]
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30</td>
<td>Introduction (Goesele)</td>
</tr>
<tr>
<td>08:45</td>
<td>The Photo Tourism system for 3D scene reconstruction (Snavely)</td>
</tr>
<tr>
<td>09:30</td>
<td>Using Photo Tourism to visualize and explore scenes (Snavely)</td>
</tr>
<tr>
<td>10:00</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>10:30</td>
<td>Multi-View Stereo (Goesele)</td>
</tr>
<tr>
<td>11:25</td>
<td>Appearance Acquisition (Lensch)</td>
</tr>
<tr>
<td>12:20</td>
<td>Conclusion (all)</td>
</tr>
<tr>
<td>12:30</td>
<td>End</td>
</tr>
</tbody>
</table>
Capturing the World, IEEE Computer June 2010

- Aerial Computer Vision for a 3D Virtual Habitat
  Franz Leberl et al., Graz University of Technology

- Google Street View: Capturing the World at Street Level
  Dragomir Anguelov et al., Google

- Reconstructing Rome
  Sameer Agarwal et al., Google et al.

- Scene Reconstruction from Community Photo Collections
  Michael Goesele et al., TU Darmstadt et al.
Scene Reconstruction and Visualization from Community Photo Collections
Noah Snavely, Ian Simon, Michael Goesele, Richard Szeliski, Steven M. Seitz