

High Dynamic Range Imaging with the Android Platform

Johan Mathe, Tim M Wong

Department of Electrical Engineering, Stanford University

Handheld HDR imaging using Droid phone

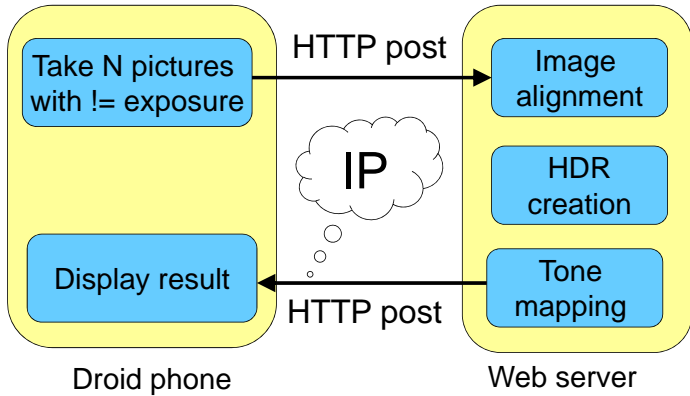
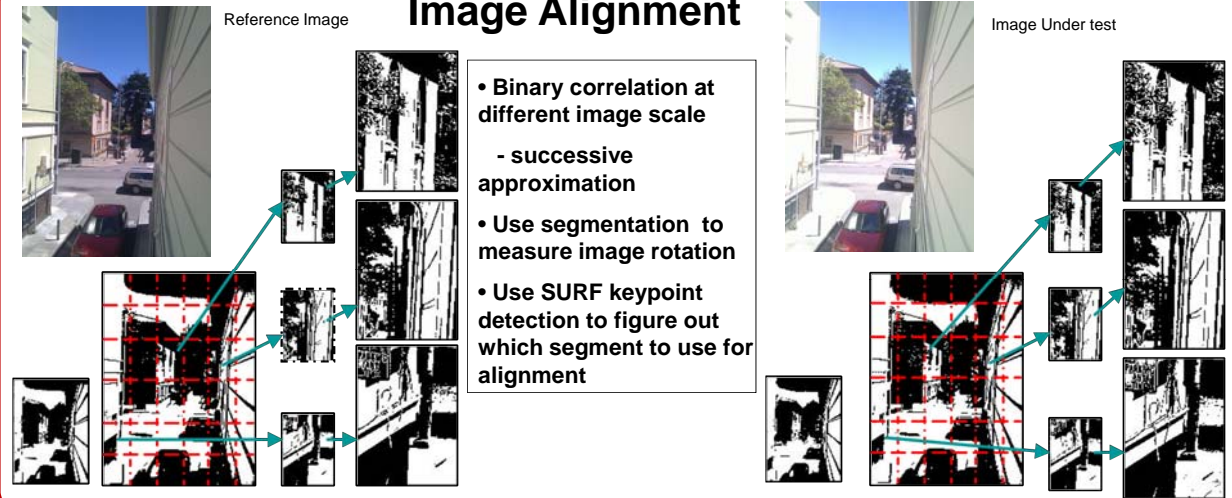


Image Alignment



HDR Merge

$$V_i = \frac{1}{N_i} \sum_{j=1}^{N_i} \frac{P_{ij}}{E_j}$$

- Threshold
- Assumes linear response of the CCD

Experimental Results



Timing

	Nexus One (s)	2.6GHz PC (s)
Alignment	120	0.6
HDR Merging	126	0.731
Tone mapping	112	0.544

Tone Mapping

$$\bar{L}_\omega = \exp\left(\frac{1}{N} \sum_{x,y} \log(\delta + L_\omega(x, y))\right)$$

$$L(x, y) = \frac{a}{L_\omega} L_\omega(x, y)$$

$$L_d(x, y) = \frac{L_\omega L(x, y)}{1 + L(x, y)}$$

- Convert from RGB color space to luminance base (xyY space) for tone mapping

- Use global tone mapping op.