A Virtual Telescope on Mobile Devices
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Mobile Image Matching Application

Feature-based Matching (SIFT/ SURF)

System Description
- Zoom in Camera
- Capture Image
- Display Viewfinder
- Crop Image
- Matched + Satellite Images
- Amplified Object
- Match Features
- Extract Features

Feature-based Matching (Affine-SIFT)

SIFT:
- Rotation and translation are normalized.
- Zoom is simulated in scale space
- No latitude and longitude

Affine-SIFT:
- Simulate latitude and longitude, then apply SIFT

Mobile Virtual Telescope System
- Client: Motorola MOTA855
- Network: 802.11gn
- Server: Lenovo Laptop Y470 2.3 GHz 4 GB RAM + WAMP
- Database: 8 Stanford Buildings

Future Work
- User Interface
- Low-resolution Image retrieval (multiple zooming in and retrieval more robust features for small images)
- Affine-invariant Image matching
- Geographic Information to assist retrieval (Client: GPS + inertial sensor; server: images with location tag)

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