

# Build Panorama on Android Phones

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## Motivation

- Automate wide-angle panoramas from a sequence of photos taken by Android phones.
- Leverage the mobile computing and network bandwidth to provide better user experience.



## System Overview

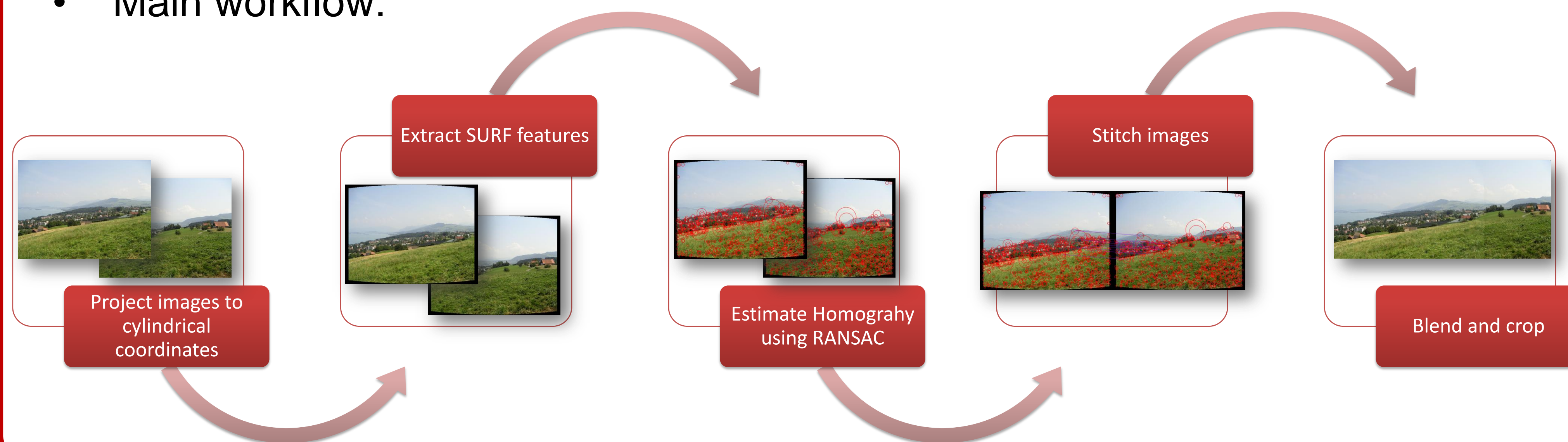
- Hardware: Motorola Droid phone(5 mega pixel camera, CPU 550MHz, Magnetic field sensor), Dell Precision PC(CPU 2.33GHz).
- Software: Android SDK r05, Android NDK r03, OpenCV 1.1 [1]
- Network: WiFi, 3G

## Related Work

- Autostitch (<http://www.cloudburstresearch.com>) for iPhone.
- Brown and Lowe, ICCV, 2007
- Panoman for Nokia phones.
- Photostitch and Photoshop for PC.

## Pipeline

- Use magnetic sensors on the phone to get the orientation of the camera.
- Down-sample image to 1/16 of the original size.
- Two-tier structure: mobile computing and cloud computing
  1. For images less than 3: all computations are on mobile devices.
  2. For images more than 3: send down-sampled images to the server and computations are in the cloud.
- Main workflow:



## Experimental Results



On phone panorama from 3 photos



On phone panorama from 3 photos



On server panorama from 7 photos

Phone		PC	
# photos	Time	# photos	Time
2	47s	5	9s
3	122s	7	15s

[1] [http://www.stanford.edu/~zxwang/android\\_opencv.html](http://www.stanford.edu/~zxwang/android_opencv.html)