Autonomous Tour Guide

Team 6
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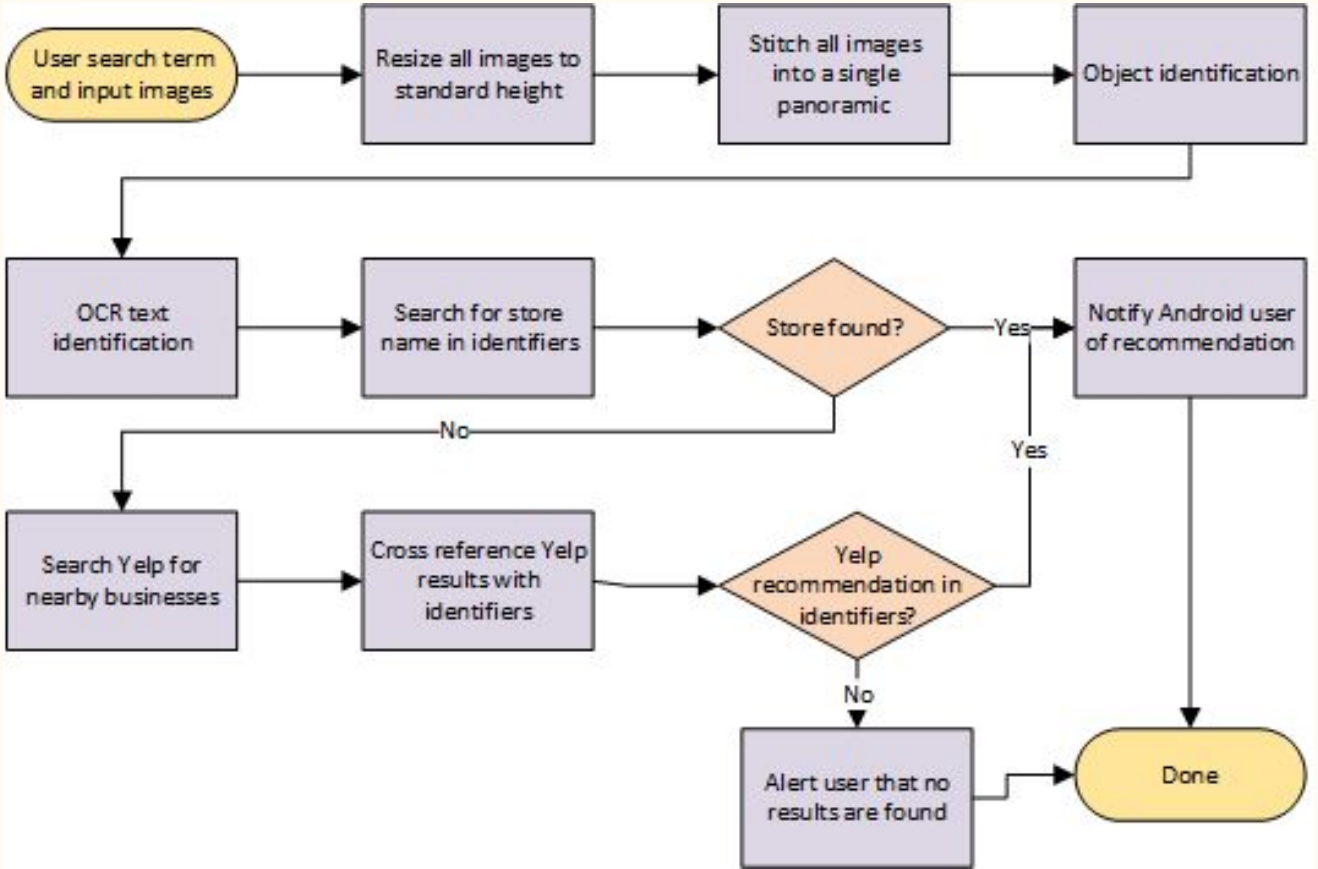
https://github.com/smoeller1/BigData-Spring2016-TourGuide

Server HLD


User search term and input images
Resize all images to standard height
Stitch all images into a single panoramic
Object identification
OCR text identification
Search for store name in identifiers
Store found?
Yes
Notify Android user of recommendation
No
Yes
Search Yelp for nearby businesses
Cross reference Yelp results with identifiers
Yelp recommendation in identifiers?
No
Alert user that no results are found
Done

ImageResizer

Outline of images are rendered using Graphics2D features from AWT and then the image normalization is done.

All images of different dimensions are resized.

Input Data: All images found in the input directory

Stitch

1. Run a SURF detection against this image and previous
2. Generate a similarity score between the features in the two images uses Euclidian distance
3. Use a RANSAC algorithm to identify the best matched features to use to stitch the images
4. Create a new image of size 2*(previous image size), and draw the matched, stitched image

Input Data:

First iteration - all image files found in the input directory

All iterations after first - an ArrayList of all sub-panoramic images from the previous iteration is passed

IdentifyImage

1. ORB is used for feature detection, due to performance (2 orders of magnitude faster than SIFT with similar quality of results)*
2. The normalized correlation coefficient method is used for matching the objects in the images

Data:

Training/testing data: Static, labeled training data set collected from Google searches

Image OCR

Utilizes the tess4j Tesseract libraries

Tesseract libraries provide optical character recognition for whole images (as utilized here), or for subsections of images

Data:

Testing/Training data: static data collected from the tess4j SourceForge site

Credits

This work was done in partial fulfillment of the requirements of CS5542: Big Data Analytics and Apps, CSEE Department, University of Missouri–Kansas City (Spring 2016). Instructor: Dr. Yugyung Lee, TAs: Mayanka Chandrashekar, Feichen Shen.