Mobile Chinese Translator
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Motivation
- To get an Android-based translation app for Simplified Chinese text.
- Inspired by advent of technology which enables us to break down language barriers. Ex: World Lens iPhone app (which unfortunately does not support Chinese).
- Intended for travelers and those who want to speed up learning Chinese.

Conclusion
- Applying this to Chinese characters poses a unique set of problems:
  - Unlike English, Chinese contains over 20k characters, causing OCR to be too slow to run completely on a mobile phone
    - Over 15 seconds for OCR alone, not even including detection, extraction, & filtering
  - Chinese characters can have many components making up a single character
    - Causes difficulties in differentiating between parts of a character and general clutter/noise
  - Different fonts and character-to-character spacing pose great challenge to the robustness of algorithm

System & Algorithm Flow
- Wait for picture & preview camera
- Upload image to server
- Get image and call Matlab
- Pre-filter (rgb to gray, de-noise, contrast, de-blur)
- MSER + superimpose box on connected regions
- Remove objects of wrong aspect ratio and small regions
- Group remaining regions with similar area
- Line up centroids of similar area to detect text regions
- Crop text areas
- Output detected text & its corresponding translation on screen
- Receive translated text from server
- Google Translate
- OCR detected text using Tesseract 3.01

Experimental Results
- Good:
  - MSER results overlayed with blobs, grouped and lined up according to centroid location
  - No errors in extraction, OCR, or translation
- Not so good:
  - Character successfully extracted, but OCR failed