Objective

- Inspired by Google-goggle and Word Lens
- Real-time camera based text translation
- Detect, recognize and translate text

Text Detection Algorithm

- **Edge Detection**
  - Blur the image using open-closed / closed-open filter
  - Get edge map using morphological operations
  - Threshold the edge map
  - Denoise using close operation

- **Filter**
  - Find the connected components and their bounding boxes
  - Filter out fault connected components based on filled area ratio and width-height ratio
  - Calculate the means of the heights of the bounding boxes
  - Keep only the bounding boxes whose heights are close to the mean

- **Otsu Thresholding**
  - Apply Otsu thresholding in each bounding box
  - Determine the foreground illumination using the information of the Illumination of the four corners of the bounding box

System Flow

- **Android Phone**
  - Image frame
  - Text Detection
  - Display Translated Result

- **Server**
  - OCR Engine
  - Transmit Binary Text Image to Server
  - Text Correction
  - Text Translation
  - Translated Result
  - Display Translated Result

Experimental Results

- We evaluated the performance of our application with a group of 10 test images under different scenarios

- Under high contrast, we achieved a text recognition rate of 88%

- Small texts, i.e. the width of a letter is smaller than 15 pixels, has relatively lower recognition rate.