Augmented Reality & Video Service Emerging Technologies

AR Smartphone Project

Prof. Jong-Moon Chung

AR Smartphone Project

Google Translate

Google Translate

❖ AR Smartphone Project 2

- Google Translate provides translation in real-time using the smartphone's camera and AR display

Google Translate

Available at Play Store and App Store

Android Google Play Store:
https://play.google.com/store/apps/details?id=com.google.android.apps.translate

Apple App Store:
https://itunes.apple.com/us/app/google-translate/id414706506?mt=8

Google Translate

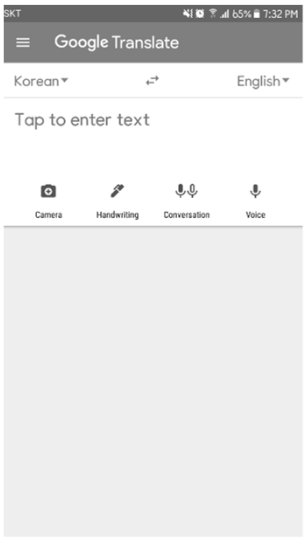
❖ Google Translate

- Real-time AR translation using off-line translation data is possible without being connected to the network

- Supported languages (Real-time AR)
  - Bulgarian, Catalan, Croatian, Czech, Danish, Dutch, English, Filipino, Finnish, French, German, Hindi, Hungarian, Indonesian, Italian, Japanese, Korean, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Slovak, Spanish, Swedish, Turkish, Thai, Ukrainian

Google Translate

❖ Application Main page

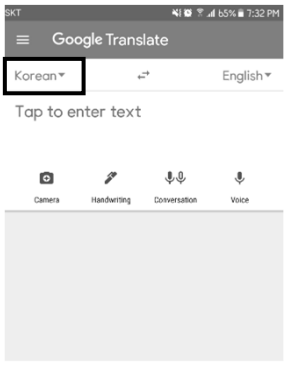


Google Translate

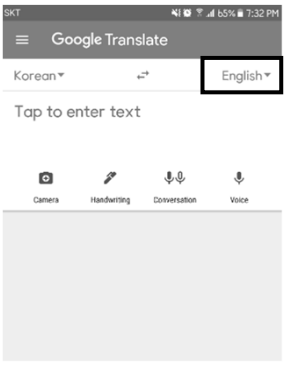
❖ Application Main page

- Translation language selection needed

Translate from



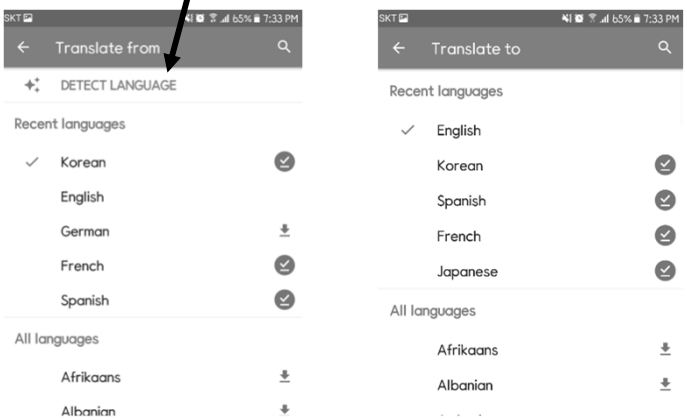
Translate to



Google Translate

❖ Application Main page

- **DETECT LANGUAGE does not support real-time AR translation**

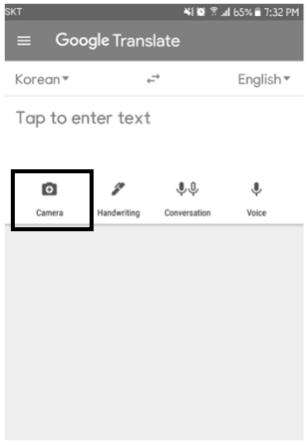


Translate from **Translate to**

Google Translate

❖ Application Main page

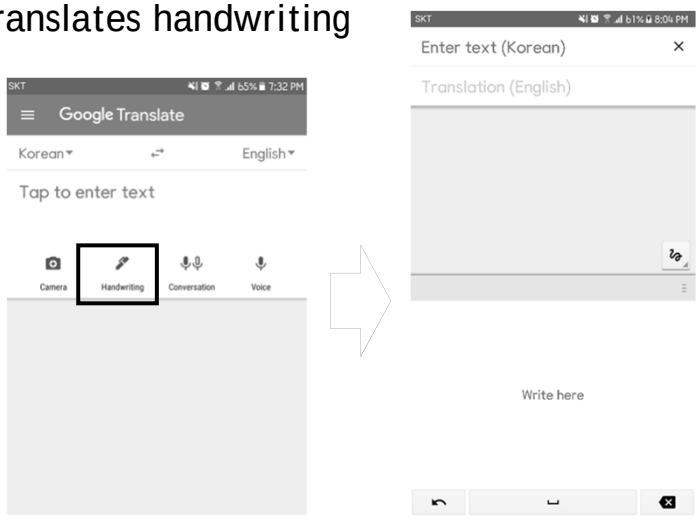
- Translation using a smartphone camera
  - Real-time AR mode and photo mode



Google Translate

❖ Application Main page

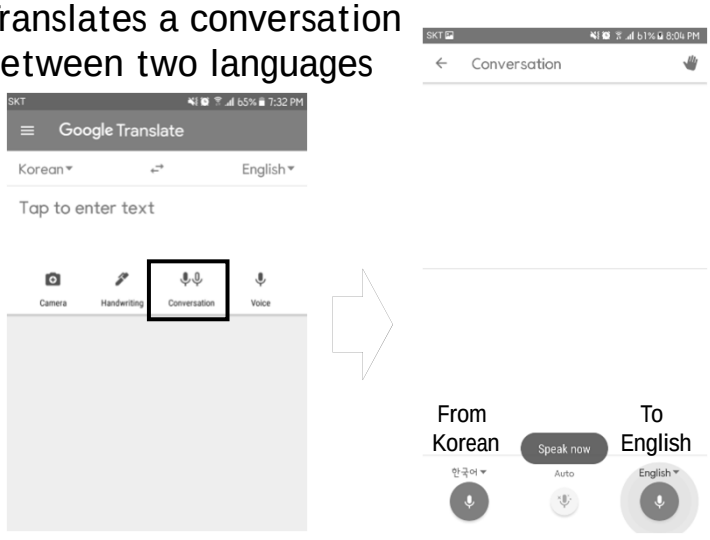
- Translates handwriting



Google Translate

❖ Application Main page

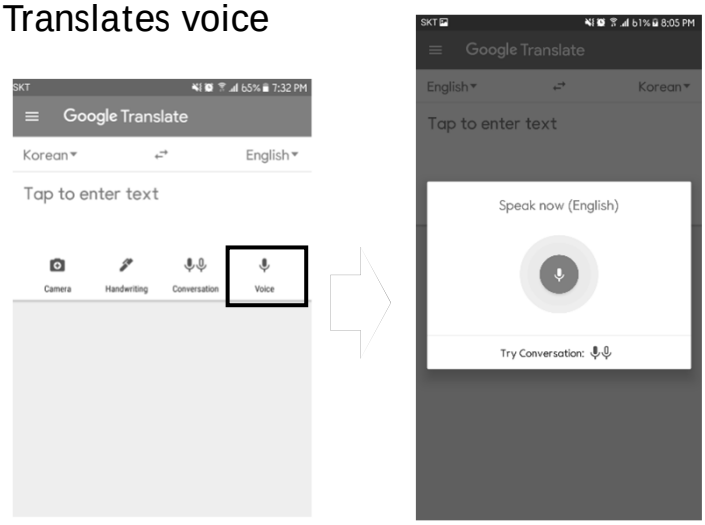
- Translates a conversation between two languages



Google Translate

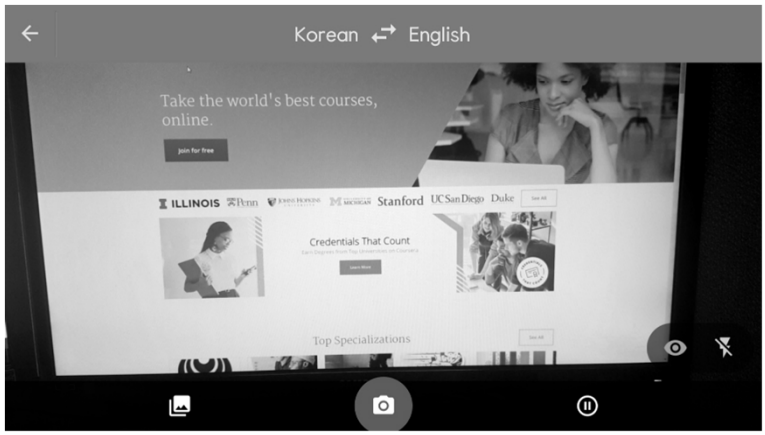
❖ Application Main page

- Translates voice



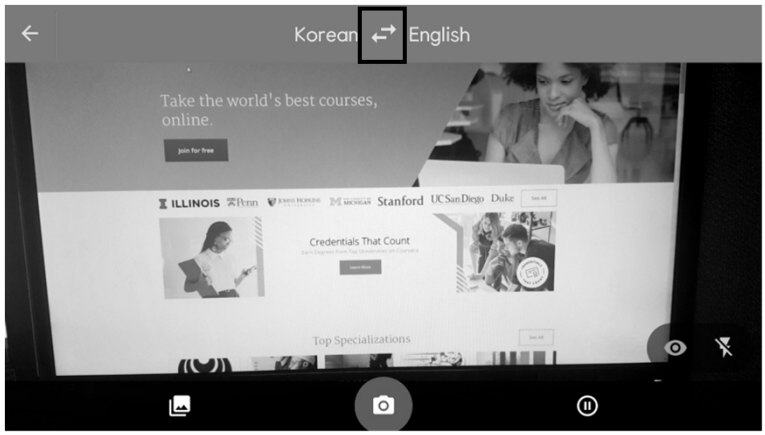
Google Translate

❖ Real-time AR translation mode



Google Translate

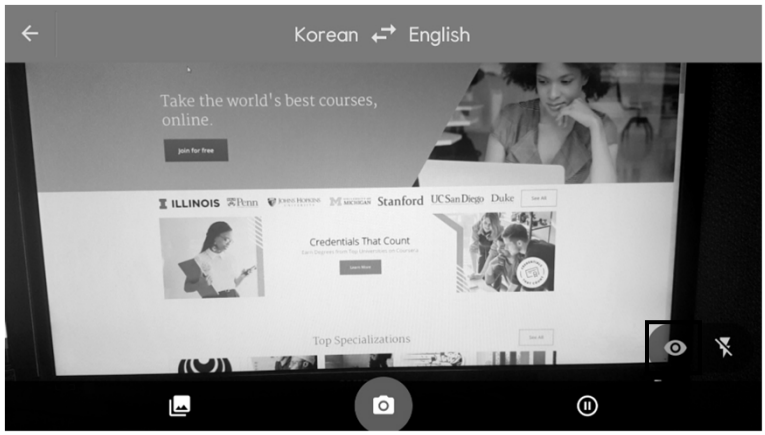
❖ Real-time AR translation mode



Switch languages

Google Translate

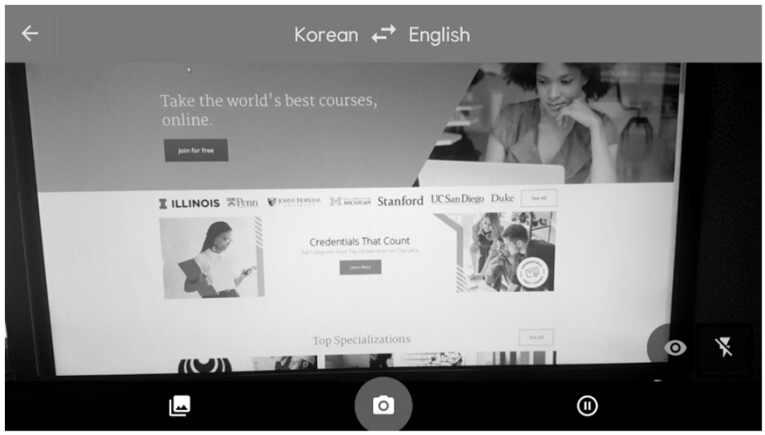
❖ Real-time AR translation mode



Turn the real-time AR translation on/off

Google Translate

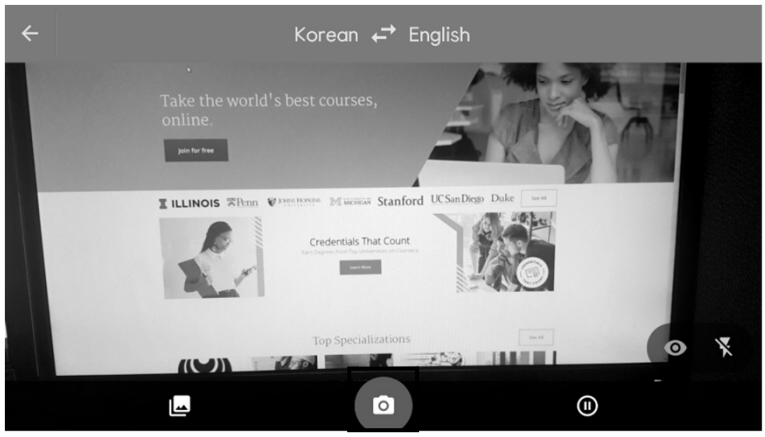
❖ Real-time AR translation mode



Turn the flash of smartphone camera on/off

Google Translate

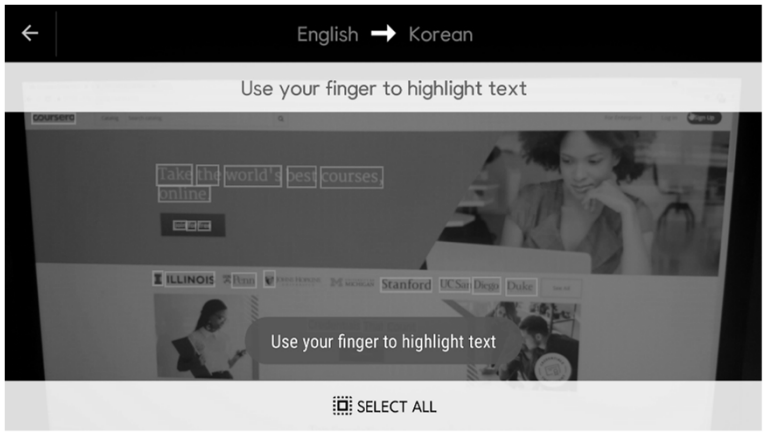
❖ Real-time AR translation mode



Translate in photo mode

Google Translate

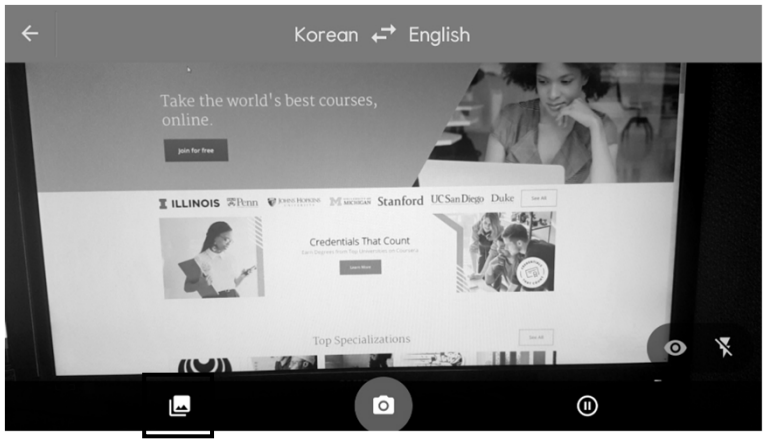
❖ Real-time AR translation mode



You can highlight text using your finger

Google Translate

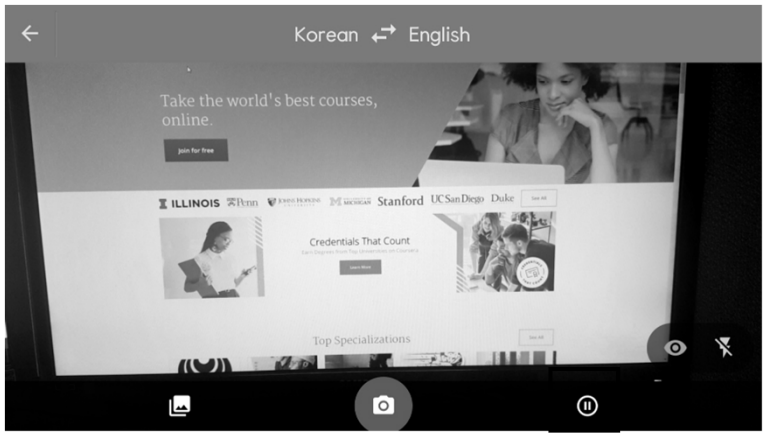
❖ Real-time AR translation mode



Load an image to translate

Google Translate

❖ Real-time AR translation mode



Pause the real-time AR translation

Google Translate

❖ Real-time AR translation

1. Prepare documents, books, and images that contain the language to be translated

Apéritifs

Coupe de champagne brut 9cl	7,5
Coupe de champagne brut rosé 9cl	9,5
Pastis 51 4cl	6
Martini, rouge, blanc ou dry 4cl	6
Porto rouge ou blanc 4cl	7
Gin Gordon's avec Tonic 4cl	9
Vodka Moskovskaya 4cl	9
avec accompagnement	
Kir Royal 4cl	7,5
Kir au vin blanc 6cl	6
Americano 12cl	9

Google Translate

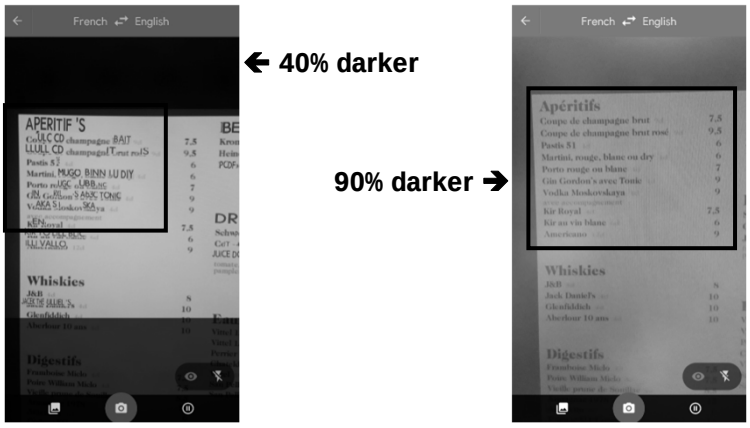
❖ Real-time AR translation

2. Try translation using the real-time AR translation mode in the Google Translate application

Google Translate

❖ Real-time AR translation

3. Try translation while changing the environment
   - **Brightness**, distance, smartphone camera resolution, etc.

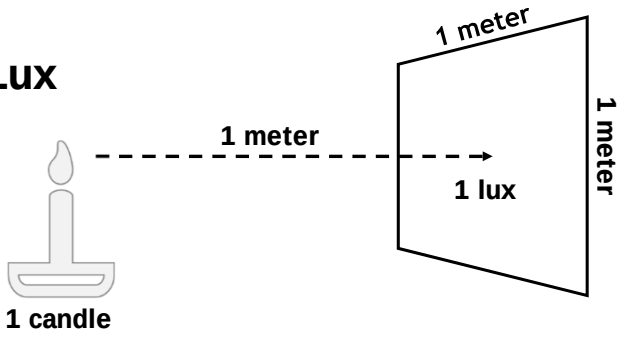


Google Translate

❖ Measuring Brightness

- **Lux**, **lx** [Cambridge Dictionary]
  A measure of the amount of light produced by something

- **1 Lux**



Google Translate

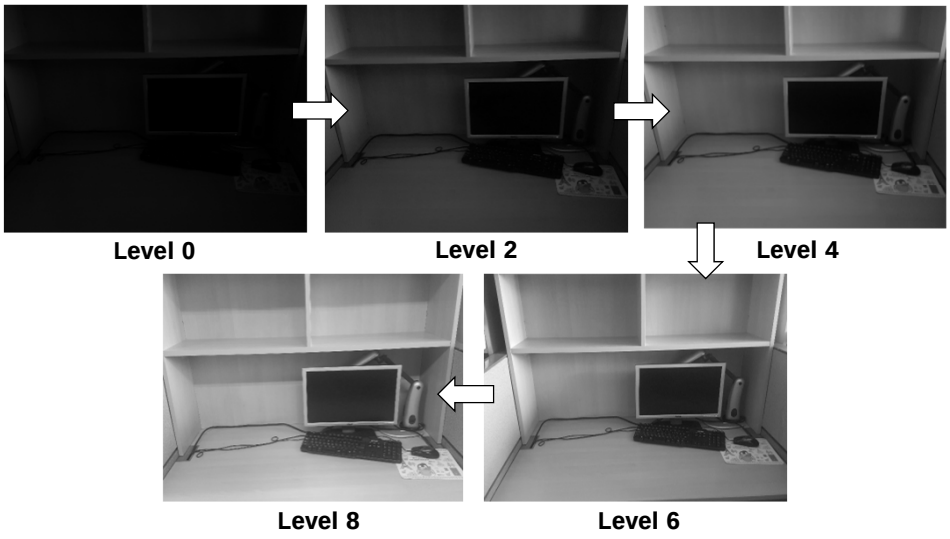
❖ Measuring Brightness

- Examples of Lux

Lux	Surfaces illuminated by
0.002	Moonless clear night sky
0.05 ~ 0.3	Full moon on a clear night
1	1 candlelight
20 ~ 50	Public areas with dark surroundings
50	Living room lights
80	Office building hallway/toilet lighting
100	Very dark overcast day
320 ~ 500	Office lighting
400	Sunrise or sunset on a clear day
1,000	Overcast day, typical TV studio lighting
10,000 ~ 25,000	Full daylight (not direct sun)
32,000 ~ 100,000	Direct sunlight

Google Translate

❖ Measuring Brightness



Project Requirements for Peer Review

❖ Google Translate Experiments

- We will test the Real-time AR translation's Brightness performance based on **Levels 0~8**
  - Consider performance in different brightness levels
  - Consider the text size, distance, and font types
  - Consider the language translations types
  - Consider performance based on light coming from different angles with different brightness levels
  - Overall, find several options that the Google Translate application may not operate properly

Project Requirements for Peer Review

- **Help your Peers**
  - In addition, give helpful tips
  - Inform others of the exciting discoveries you experienced using the Google Translate AR app
  - Inform your peers about other great AR apps you find that are fun and helpful
  - Help others so they can understand more on AR systems

AR Smartphone Project

References

References

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- *Special Thanks to my Teaching Assistant*
  - **Sunho Seo**