Reality Translator

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Project Concept & Motivation

- Concept:
  - Instant translation of the real world through a pair of glasses

Competitive Analysis

Products	Translation	Instant Translation	Inconspicuous Use	High Accuracy of Detection	Under $250
Reality Translator	✓	✓	✓	✓	✓
Vuzix Wrap 920AR			✓		
Word Lens	✓	✓			✓
Google Goggles	✓				✓
LookTel	✓				✓

Requirements

- **Reality Translator translates and render translations on the glasses in near instant real time.**
- **Reality Translator emphasizes on ease of use – allowing for portability, and inconspicuous hands free use**

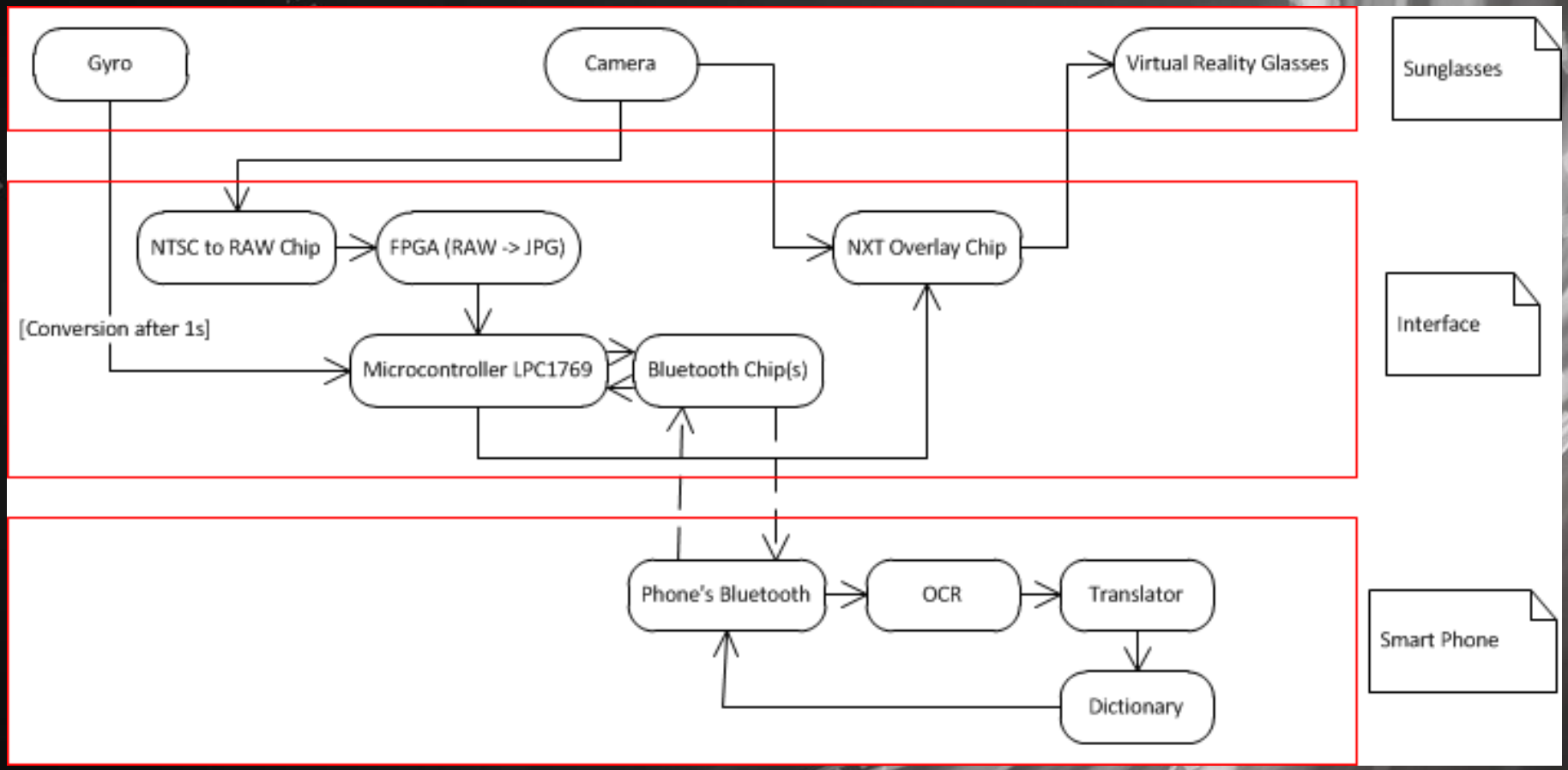
- Timing Requirement: The delay between processing the image and rendering translated text is less than 2 second.

Technical Specifications

- MAXIM MAX9526EVKIT+
  - NTSC to RAW converter
- 2 Koolertron NTSC Cameras
  - 420 TV Lines
- NTSC Overlay
  - Using MAX7456
- Vuzix Wrap 920 Virtual Reality Glasses
  - 640x480 pixels
  - Truecolor
- STM Gyro (L3G4200D)
  - 3 axis
- Bluetooth Dongle
  - 1.5 Mb/s
- Roving Networks WiFi Module

- OCR (Tesseract, Mezzofanti)
- Java (Android App)
- Bluetooth/WiFi Protocols

Architecture



Risks & Mitigation (software)

Risk	Mitigation
Texts are too blurry	Sharpen the image and filter out the noise before image processing
Size of text is too small for OCR	Make user understand limitations
Low contrast between background and text	Increase the contrast during image processing
Filtering/Processing images takes too long	Don’t filter
Porting OCR libraries to Java may not work	Write own OCR, modify an existing app
Speed of OCR	Send it off to the cloud
Word by word translation might translate out of context	Send it off to another app/ Google translate
Dictionary Library unable to be found	Make own dictionary library
UI not intuitive enough	Fix UI
Bluetooth does not get detected	Use WiFi
Latency of data transfer via Bluetooth	Use WiFi, change format
Bluetooth transmission speed	Use WiFi

Risks & Mitigation (hardware)

Risks	Mitigation
Transmission to the phone (data size, bandwidth)	Compress image to JPEG
Camera interface with glasses	Testing with the splitter and add different chips as needed
Glasses double vision	Include user manual detailing how to use the product and to set optimal distance from eyes
Glasses too heavy/bulky after putting on all the component	Replace components, Redesign EVKs into single PCB
Battery life of glasses not useful for practical use	Contact company, change to rechargeable Li-ion battery
Connection of Bluetooth can't be established	Use WiFi
Can't use glasses without remote control	Take apart remote control
Camera too heavy/large, FOV not large enough	Buy another camera
Intermediary components don't work	Buy new components