SLaTE8
(Sign Language To English)

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Progress Presentation

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Background

Over 5 percent of the world's population —
360 million people — are deaf.

28 million with significant hearing impairment
in the U.S.A

**Estimates range from 500,000 to two
million ASL speakers in the U.S. alone.**

- Language barriers

Customer & Needs

Customer:

- The hearing impaired community
- The mute community
- Those needing to communicate with ASL speakers

Needs:

- Speed
- Accuracy
- Adaptability
- Portability
- Affordability
- Weight

Problem Statement

Our project is to build a portable device that converts ASL gestures to text and uses speech-to-text technology for successful communication between users and non-users of American Sign Language.

Design Requirements

- Portability (less than 0.25lbs)
- Cheap individual products (less than $10)
- Fast computation speed (in the order of milliseconds)
- Precision of 1
- Recall > 0.95
- F1 measure of at least 0.97
- 30 frames per second of image input

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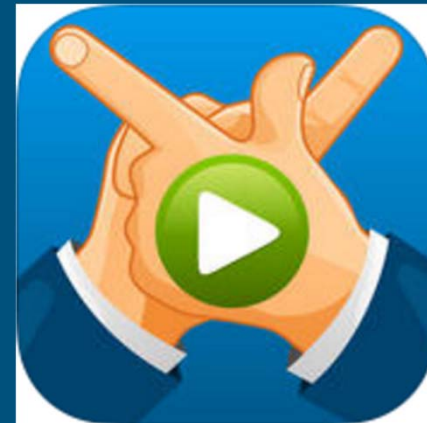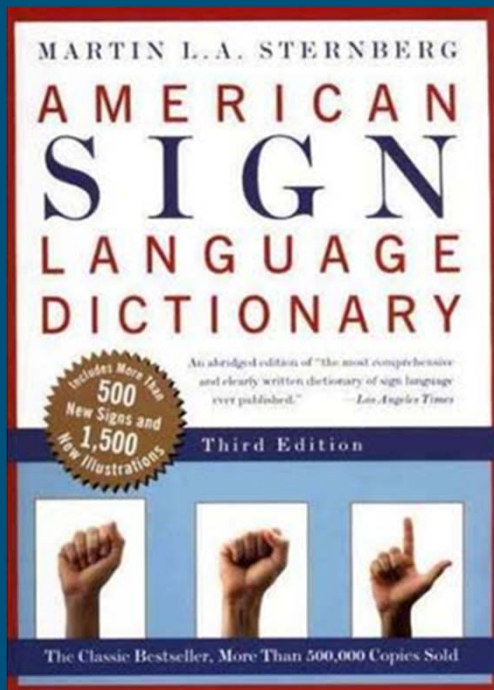
Current Status of Art

University of Houston

Microsoft Kinect
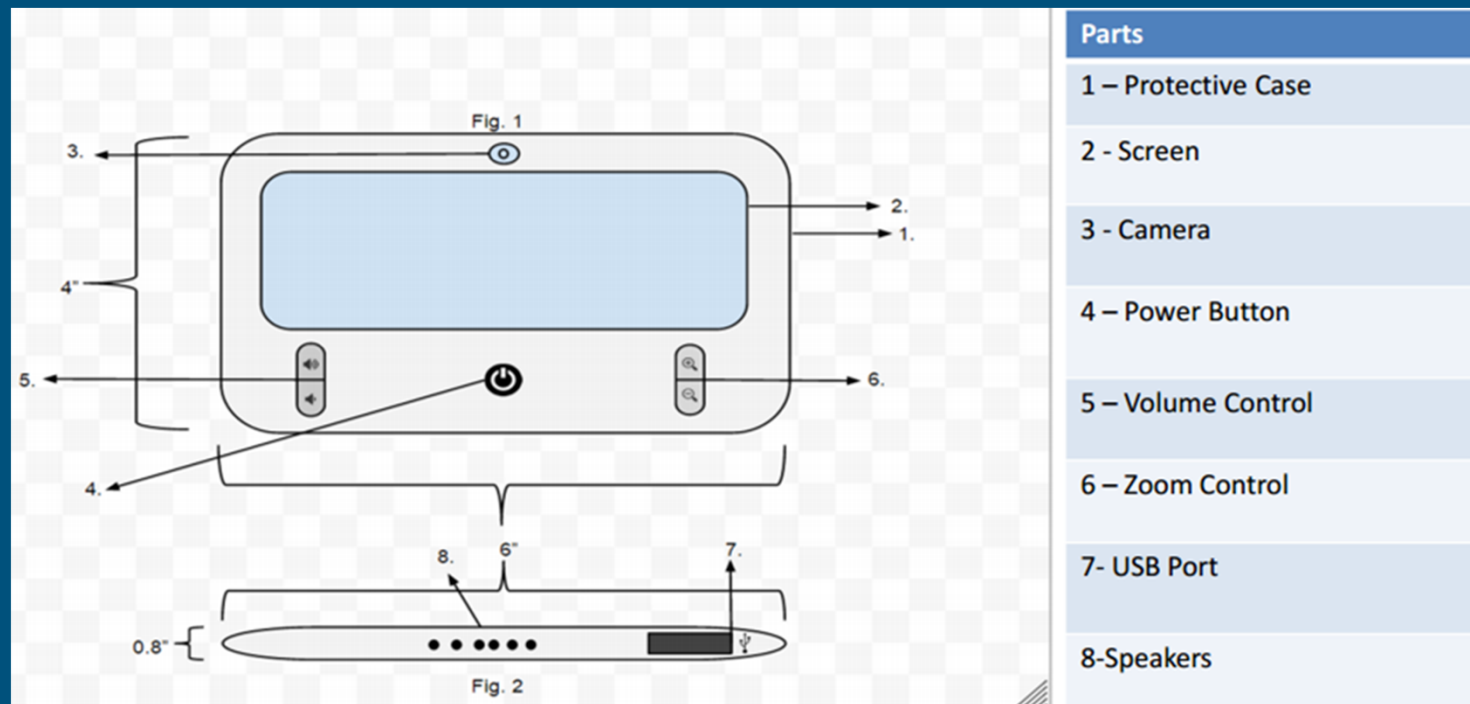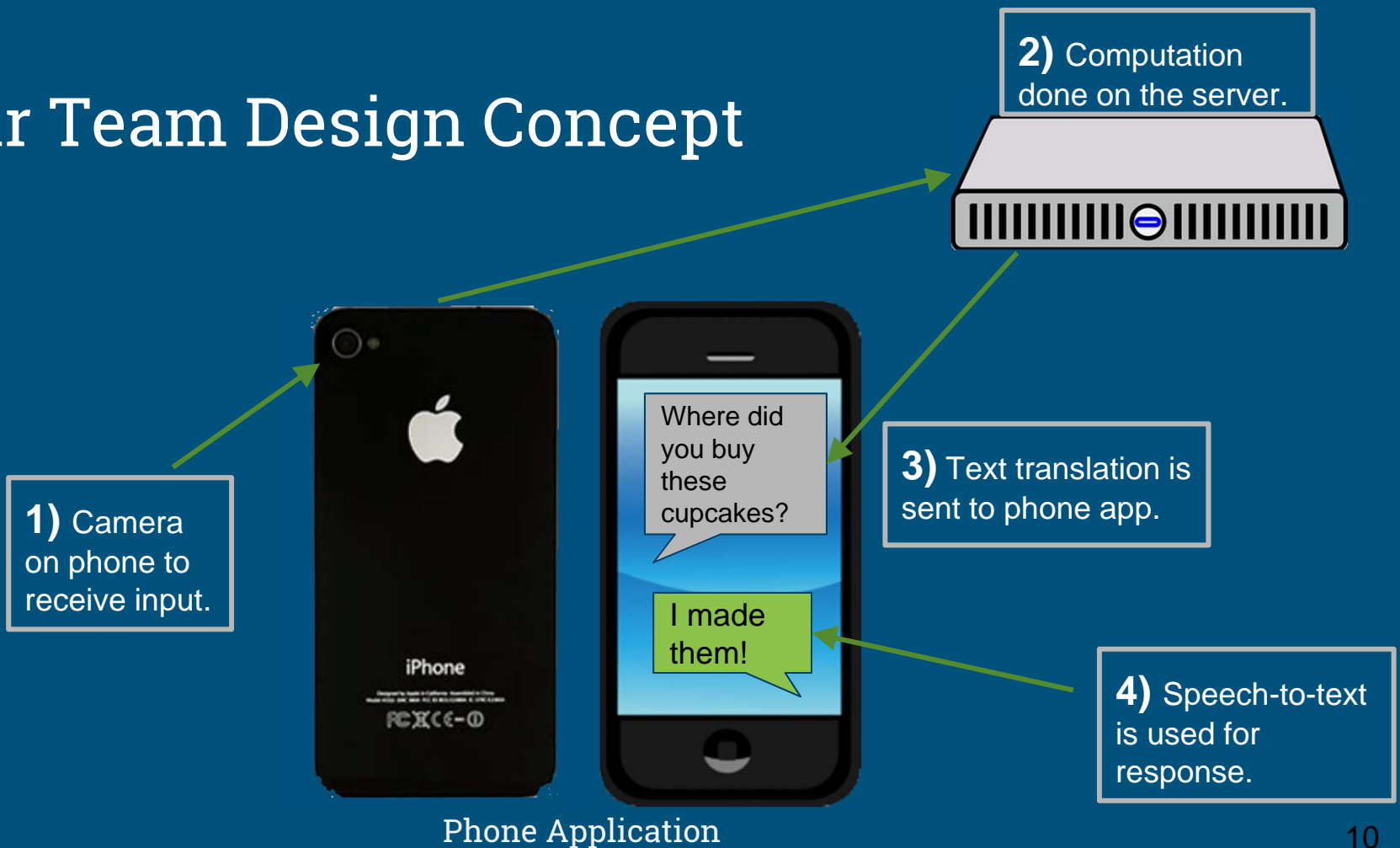

Texas A&M

Current Status of Art

ASL Translator App

Last year's approach
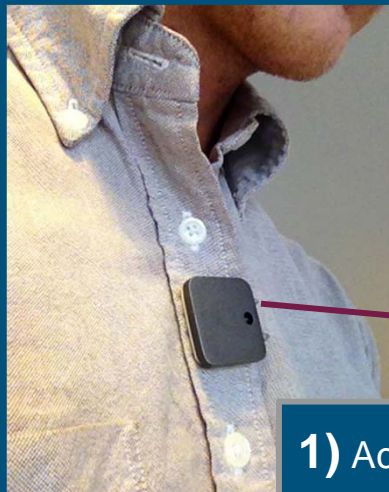

Parts	
1 – Protective Case	
2 - Screen	
3 - Camera	
4 – Power Button	
5 – Volume Control	
6 – Zoom Control	
7- USB Port	
8-Speakers	

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Our Team Design Concept (cont.)

The inclusion of wearable accessories.

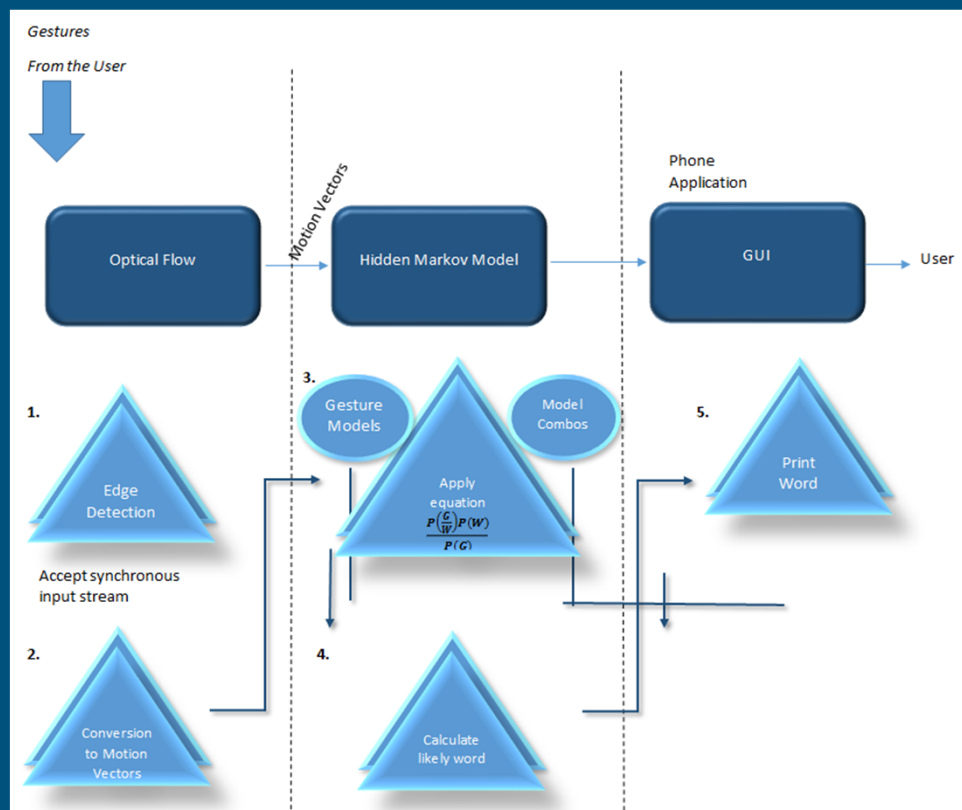**2)** The app communicates with the server.

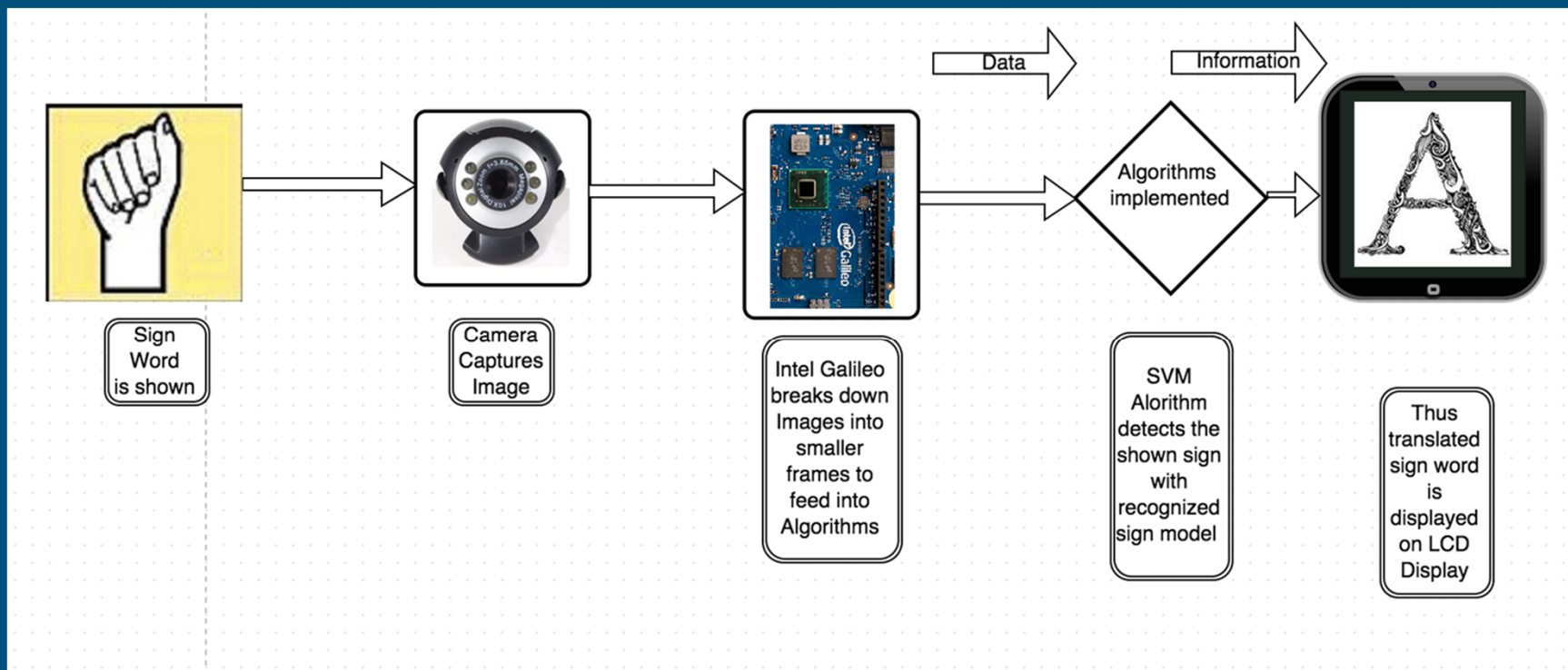**1)** Accesories communicate with the app.

I don't believe you!

1) Accesories communicate with the app.

Our Team Design Block Diagram

Solution Approach

Design Approaches

There were many other components we could've used.

Selection of the Top Design

Component	Selection Criteria	Raspberry Pi		ArduCam	Texas Instruments	Intel	Red Bear Lab
Boards	Name of Board	Raspberry Pi 2 Model B 1GB Project Board		ArduCam Wifi Camera Board with 2 MP	MSP430F5529 USB LaunchPad	Intel Galileo Atom Board	WiFi Mini CC3200 Development Board
	Costs (15%)	10		15	13	3	8
	Weight (15%)	10		12	7	11	15
	Size (15%)	8		14	???	10	15
	Software (5%)	4		5	3	5	4
	Camera Compatibilty (25%)	25		25	0	10	22
	Wristband Compatibility (25%)	0		25	0	25	22
	Sum	57		96	23	64	86
Cameras	Name of Camera	Raspberry Pi Camera Module 5MP Wide Angle	Spy Camera	ArduCam Wifi Camera Board with 2 MP			
	Costs (25%)	17	22	25			
	Weight (30%)	27	29	25			
	Size (30%)	15	30	25			
	Resolution (15%)	15	15	12			
	Sum	74	96	87			
Wristbands	Name of Wristband	Shield LCD 16X2	RGB LCD Shield Kit				
	Cost (40%)	35	30				
	No. of Pins used (20%)	5	20				
	No. of Characters displayed (40%)	30	30				
	Sum	70	80				
Platform	Name of Platform	Apple iOS	Android				
	Ease of programming (20%)	18	18				
	Estimated time (50%)	45	18				
	Open-Source (30%)	15	30				
	Sum	78	66				

Final Design / Top Design

Accessory #1: Wifi

Camera Wearable Device
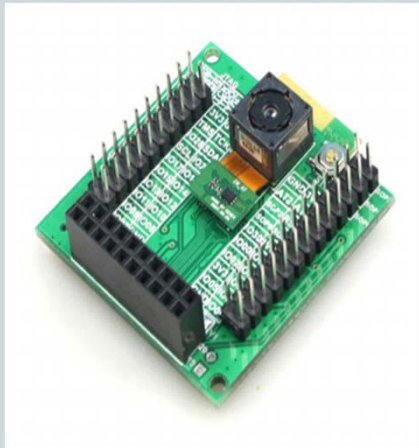
Phone application

Phone application:

iOS based app

Accessory #2: LED

Display Wristband

App features

- Sign to text

- Speech to text

- Text to voice

- Username/ password based app

- Storage

Timeline

Conclusion