

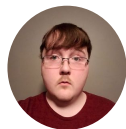
Feasibility Presentation

Crystal CLEAR

Continuous Language Education through Augmented Reality

Team Crystal
Old Dominion University
CS 410, Fall 2017
November 2, 2017

Meet Team Crystal



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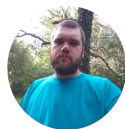
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Problem Background

- Communication is difficult, even in a speaker's native language.
- When it comes to travel, many tourists feel like they will be unable to understand or communicate with locals.
- When learning a new language, it can quickly become arduous to memorize different objects and vocabulary words.
- Students can quickly fall behind if their native language is not the same as the language they are taught in.



Problem Statement

Learning languages is a complex process that can be difficult when attempting to overcome language barriers. Identifying objects and using vocabulary correctly is difficult in a new or unknown language.



Current Process Flow

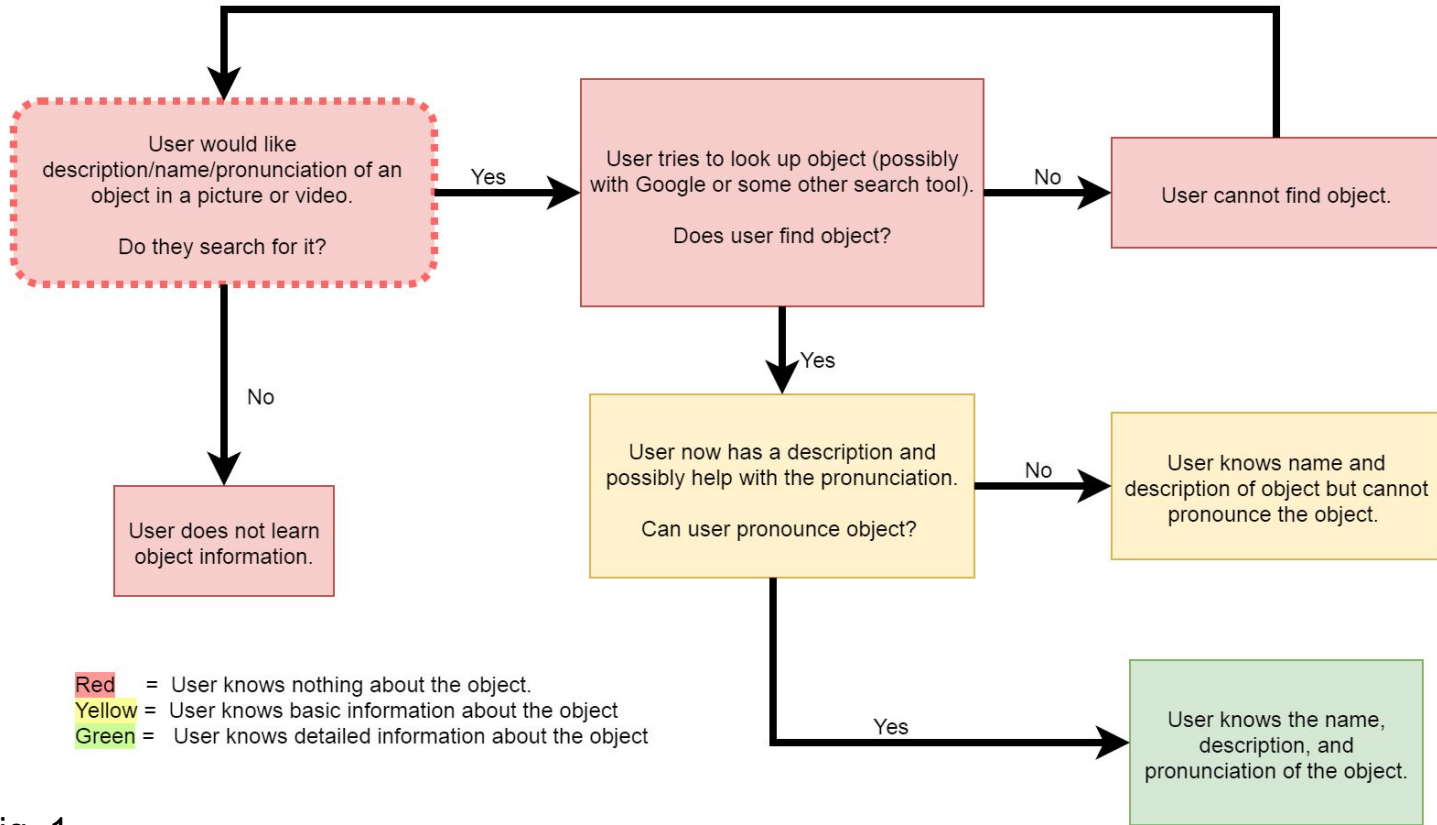


Fig. 1

Our Solution

Crystal CLEAR

Continuous Language Education through **Augmented Reality**

What will Crystal CLEAR do?

The Program Will:

Identify a Selected Object

Display Pertinent Information for the
Object

Provide a Pronunciation Example

Give an Example or Phrase

The Program Will Not:

Translate Text



How Does Crystal CLEAR work?

1. Capture Video or Image
2. Select Area
3. Identify and Label Object
4. Provide Object Information

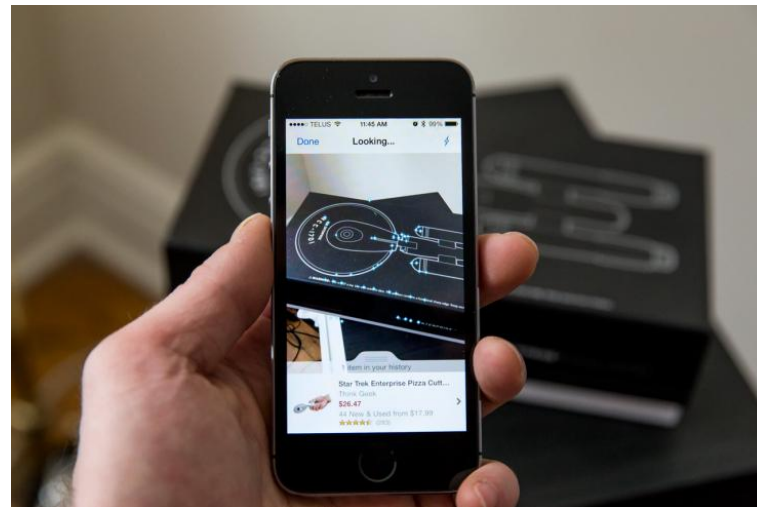


Fig. 2

Solution Goals and Objectives

We hope that the use of Crystal CLEAR will

Allow for Users to:

Learn Effectively

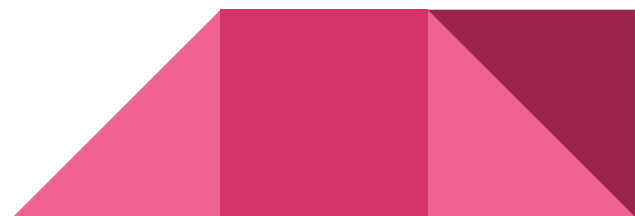
Travel Confidently

AND

Make Different Languages:

Accessible to Users

Available Anywhere



Solution Process Flow

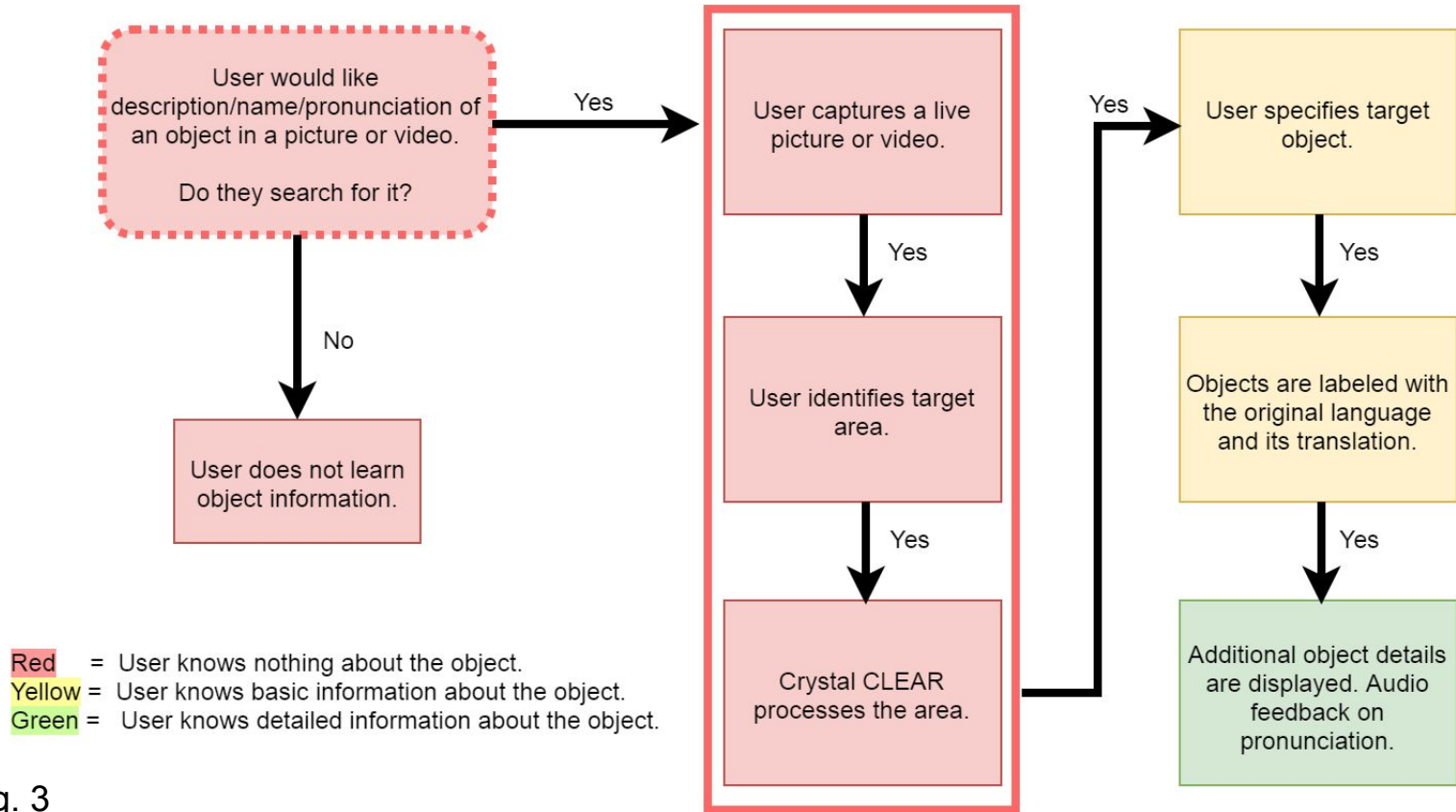


Fig. 3

Major Functional Components

Smart Phone with Camera

Computer Vision API

Translation Engine

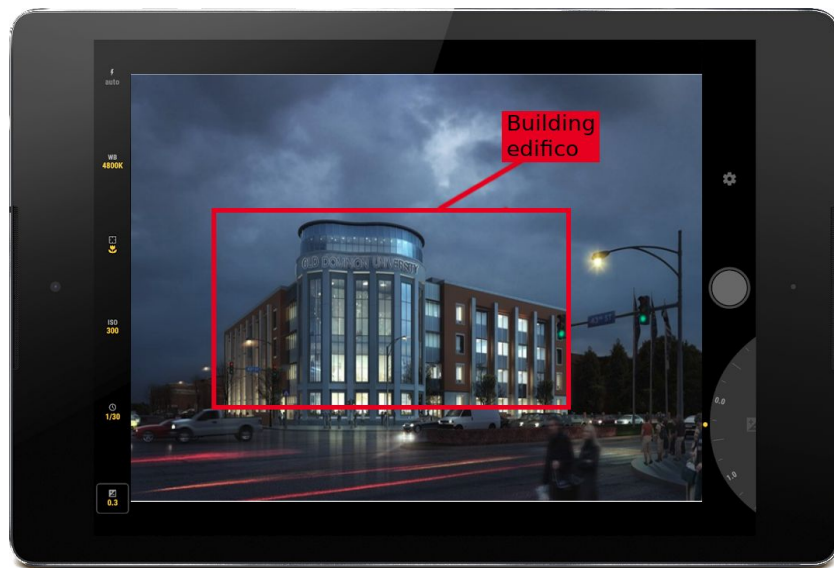
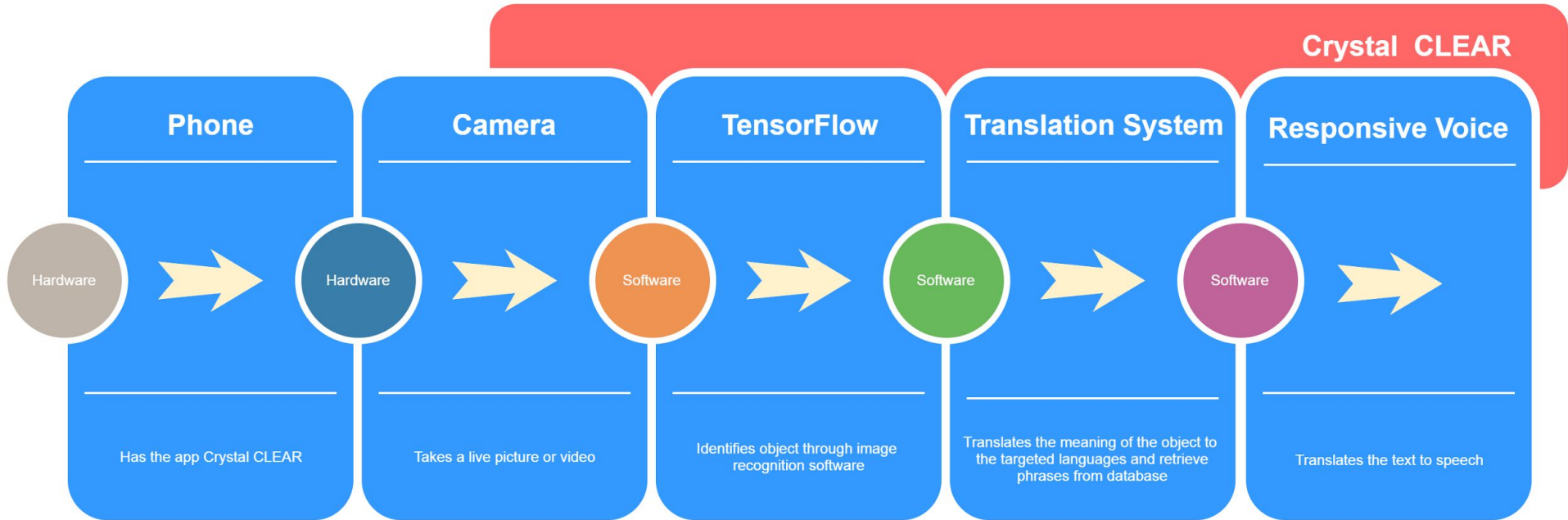


Fig. 4

Major Functional Components Diagram

Fig. 5



Identification of Software Development



Programming Languages:

Python

Java



Google TensorFlow

How Does This Work?

Image Recognition

Positive Reinforcement

Deep Learning

Why Are We Using This?

Open Source

Credible

Flexible



Fig. 8

Project Management Tools



Fig. 9



Jenkins

Fig. 10



git

Fig. 11



PyDOC

<http://www.cleiltonbueno.com>

Fig. 12



Marketing Plan

Customer Base:

Educational Facilities

International Businesses

Travel Agencies

Distribution:



Fig. 13



Fig. 14

End Users

Individuals Learning a New Language

Educators Teaching a New Language

Individuals Travelling Abroad



Marketing Plan: Competition Matrix

Characteristics	Crystal CLEAR	Blippar	Aipoly	Google Translate	Google Lens
Database of Objects	✓	✓	✓	✓	✓
Description of Target Object	✓	✓		✓	✓
Pronunciation of Target Object	✓		✓	✓	✓
Sentences or Phrases Using Target Object	✓	✓			
Multiple Language Support	✓			✓	✓

Fig. 15

Competition: Google



Google Translate

Fig. 16

Translates Text

Translates Audio

2015: Acquired World Lens

Translates Images

2017: Announced Google Lens

Benefits to End Users

For Travellers:

Aid in Situations Where User is Lost

Allow Added Ease for
Communication

Avoid Unintentionally Offensive
Actions or Words

For Educators:

Mitigate Typical Barriers to Learning

Impart Meaningful and Real Time
Examples

Provide an Added Level of Accessibility to
Language



Crystal CLEAR: Summary

Continuous Language Education through Augmented Reality

What:

Makes Language More
Readily Accessible

Provides Meaningful Real
World Examples

Helps Mitigate Learning
Obstacles And Travelling
Concerns

How:

Utilises Augmented
Reality Through Smart
Devices

Identifies Objects
Through Machine
Learning

Provides Translations For
Specified Objects

Who:

Educators

Travel Agencies

International Business

Language Aficionados
and Beginners



References

Bain, Nick. "Language Barriers' Stop Five Million UK Adults from Travelling Abroad." *Hostelworld Group*. November 2010.

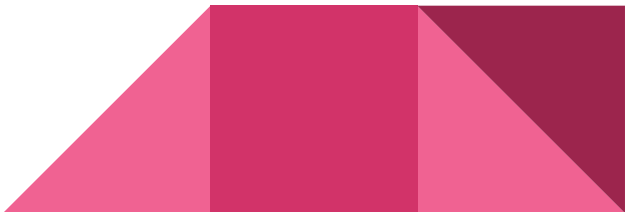
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Backman, Kenneth & Dennis-Baldwin Elizabeth. "The Effect of the Language Barrier on Intercultural Communication: A Case Study of Educational Travel in Italy." *Taylor & Francis Online*. 16 September 2009.

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"TensorFlow" *GitHub*. 23 January 2017.

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Picture References

Fig. 1: Current Process Flow

Fig. 2:
<https://techcrunch.com/2014/02/06/amazon-puts-image-recognition-into-its-main-ios-app-prepare-to-be-even-more-showroomed-retailers/>

Fig. 3: Solution Process Flow

Fig. 4: GUI Mock-Up

Fig. 5: Major Functional Component Diagram

Fig. 6: <https://www.skylinelabs.in/blog/images/tensorflow.jpg>



Picture References

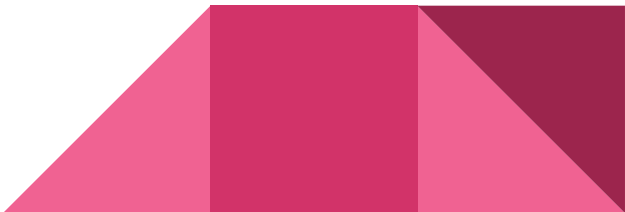
Fig. 7: <https://responsivevoice.com/wp-content/uploads/2015/04/responsivevoice.com-logo400x.png>

Fig. 8:
https://lh3.googleusercontent.com/N_Nk4NMg4L3_1o8bj1eZR53rigiJXXkt34APyPBqb_gU3WmpCCyG5ArT69qkC80wNtuSHyUImM6R5fVpm_jWjSORekbJJkA=s688

Fig. 9: <https://luna1.co/232620.png>

Fig. 10: <https://leaptest.com/wp-content/uploads/2017/01/jenkins.png>

Fig. 11: <https://git-scm.com/images/logos/downloads/Git-Logo-2Color.png>



Picture References

Fig. 12: http://cleitonbueno.com/wp-content/uploads/2015/03/PyDOC_cleitonbueno.com_.png

Fig. 13: <https://i.pinimg.com/474x/3c/d5/67/3cd5679f54dc60811383649f9f6ea37d--github-logo-computer-logo.jpg>

Fig. 14: <https://s.aolcdn.com/hss/storage/midas/d08e426575725273f7e6976b898542bd/204459763/appstores-640.jpg>

Fig. 15: Competition Matrix Chart

Fig. 16:
http://www.icavictoria.org/wp-content/uploads/2017/03/logo_lockup_google_translate_icon_horizontal_en-gb-002.png