



18th Annual City Tech
Poster Session

Object Recognition with Augmented Reality

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Computer Engineering Technology

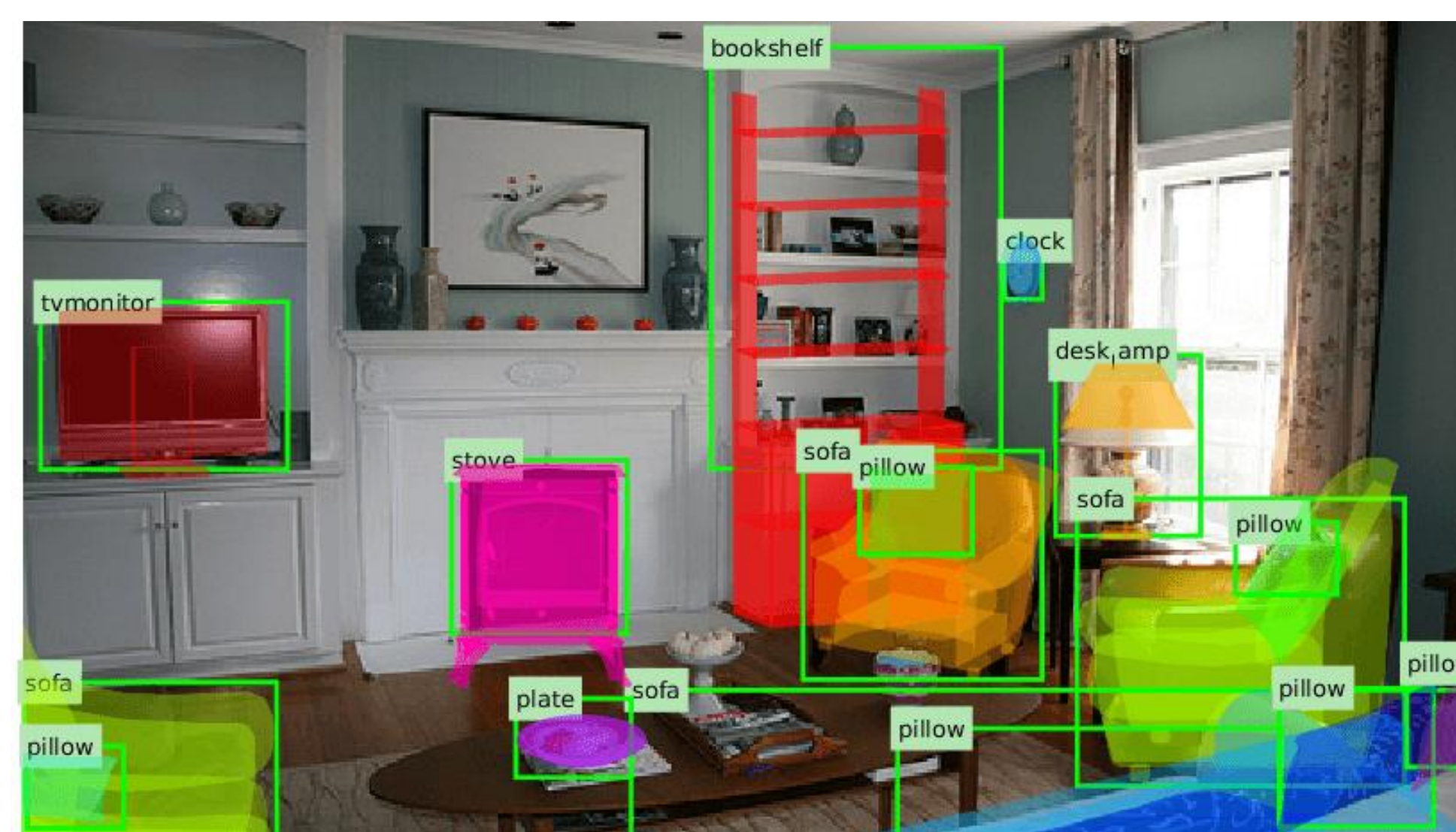
ABSTRACT

Machine Learning and Deep Learning are subfields of Artificial Intelligence and have been implemented in applications that can detect and label objects and figures such as a chair, a person or even some kind of animals. We have developed an application that makes use of Augmented Reality and Object Recognition. The capability of this app is to label detected objects with tags and relay the information to people who are visually impaired. These combined technologies can benefit such individuals in public places by helping them reach their destination safely. The app will guide the individuals in need to prevent from colliding with objects and also by recognizing other useful subset of objects such as stop signs.

INTRODUCTION

- **Augmented Reality (AR)** and **Artificial Intelligence (AI)** are two of the most important frontiers of technological development.
- **AR** is a technology that superimposes digital content, generated by computers, over real-world environments; it provides an enhanced view of the real world. AR can provide an aid in visualization by simulating 3D objects that can be manipulated [1].
- **AI** aims to make computer programs or machines to learn and make decisions.
- A subfield of AI is **Computer Vision (CV)**, which deals with the capabilities of machines to recognize and interpret the visual world from images on videos and real-world examples.

OBJECT RECOGNITION



- This type of technology combines **Computer Vision** and **Image Processing** and detects instances of semantic objects of a certain class in both digital images and videos.

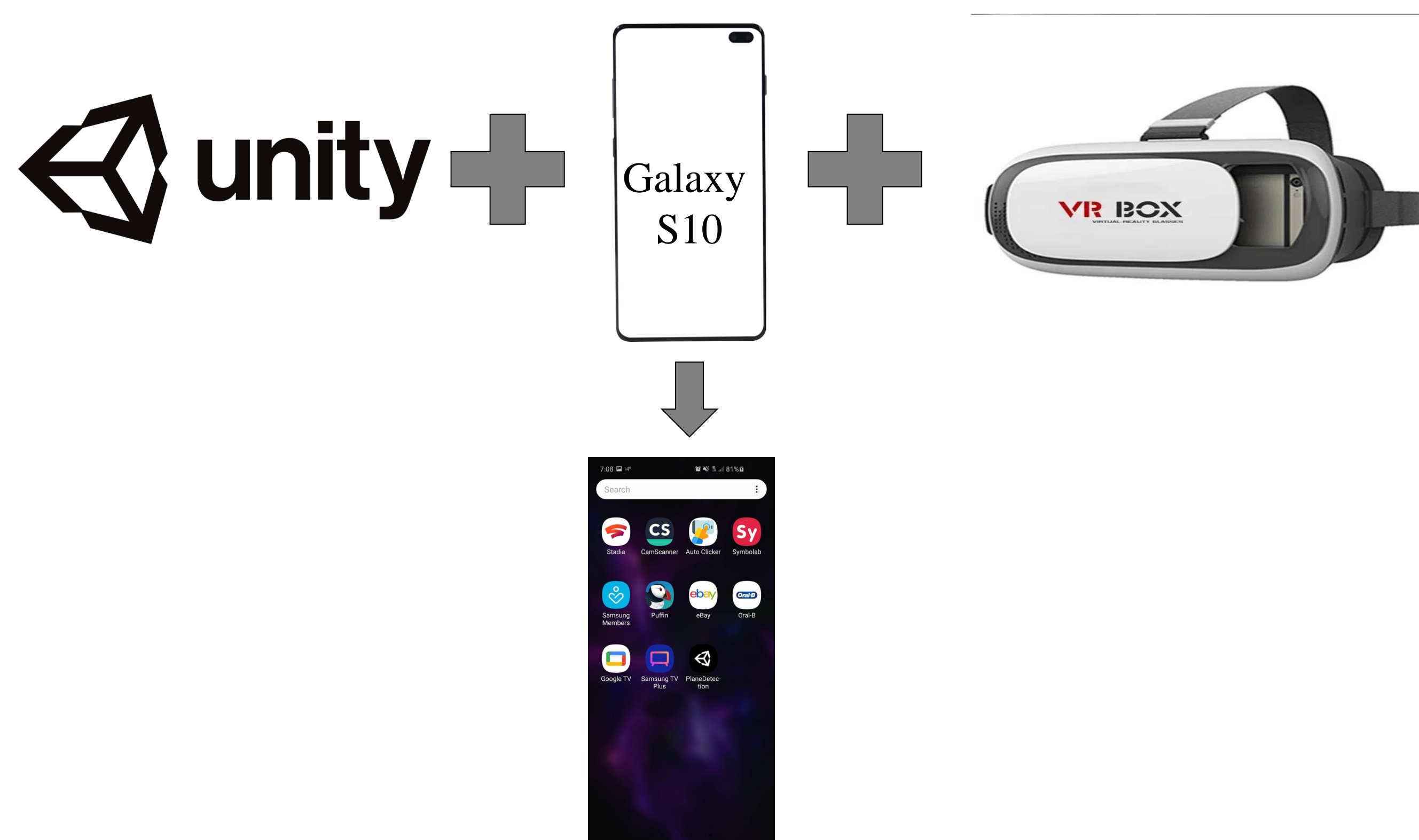
PROJECT RESULTS



CONCLUSIONS

- The app is stable with Augmented Reality and Unity.
- The app can detect several planes and objects but labeling of each objects did not work out so well.
- The app is developed on an Android Galaxy S10 and does not crash.
- Developing for Iphone and ARKIT is a very complex process and requires more time in development.
- We plan on continuing exploring this project for a more immersive experience.

IMPLEMENTATION/TOOLS



MATERIALS AND METHODS

To build this app, we will integrate the following technologies:

Unity: A video game engine to create the required virtual elements.

VR BOX: A cheap AR/VR Headset

Android: Used as a screen for AR Glasses

TensorFlow: A Machine Learning database used for training object recognition.

REFERENCES

- [1]Aouam, D., Benbelkacem, S., Zenati, N., Zakaria, S., Meftah, Z. (2018) "Voice-based Augmented Reality Interactive System for Car's Components Assembly." Proceedings of the 3rd International Conference on Pattern Analysis and Intelligent Systems (PAIS). Tebessa, Algeria. 24-25 Oct. 2018