Coding Multilingual Capabilities on a Multimodal Platform: The Challenges and Experiences

Wendy C. Velasquez Ebanks
University of Maryland University College
wvelasquezebanks@student.umuc.edu

Wanda Eugene, PhD
University of Florida
weugene@ufl.edu

Juan Gilbert, PhD
**University of Florida**
juan@ufl.edu

Mentor and Adviser: Dr. Juan E. Gilbert, Endowed Professor and Chair, University of Florida

Abstract

Prime III is a secure accessible, multimodal electronic voting system that emerged from an initiative to create an innovative voting system that could be accessible to everyone. Using touch screens, voice, typing, and switch devices, Prime III allows a wide range of citizens to participate in the voting process. Missing, however, are multilingual capabilities. Without this feature, voters with limited English proficiency may be disenfranchised, unable to understand complex statements of importance while casting their vote. The goal of this research is to analyze, document, design, and implement a strategy to transform Prime III into a multilingual-multimodal platform. Given that Spanish is spoken in more than 36 million homes, we chose this to demonstrate our extensions. As a proof of concept this implementation was developed without an API that uses online libraries, since Prime III works offline. The Prime III software is hardware independent and is coded mainly in JavaScript; it uses an HTML, CSS, and PHP programming languages. The complexity of the Prime III structure presented several challenges. Ranging from translating the main parts of the frontend and backend that will facilitate the voter interaction, to exploring and analyzing the limited resources available that allow creating a translation package/function without using online libraries, like Google API, and that can work with a multimodal platform. In an effort to understand and document the usability and functionality of parts of the Prime III algorithm we created a series of test functions. The template developed from the proof of concept will be used to include additional languages, to extend the accessibility benefits of Prime III to a broader range of voters. In this poster, we will present some of the challenges encountered and lessons learned while extending Prime III to include multilingual features and options.

Overview

Prime III is an electronic voting system, on a multimodal platform [1].
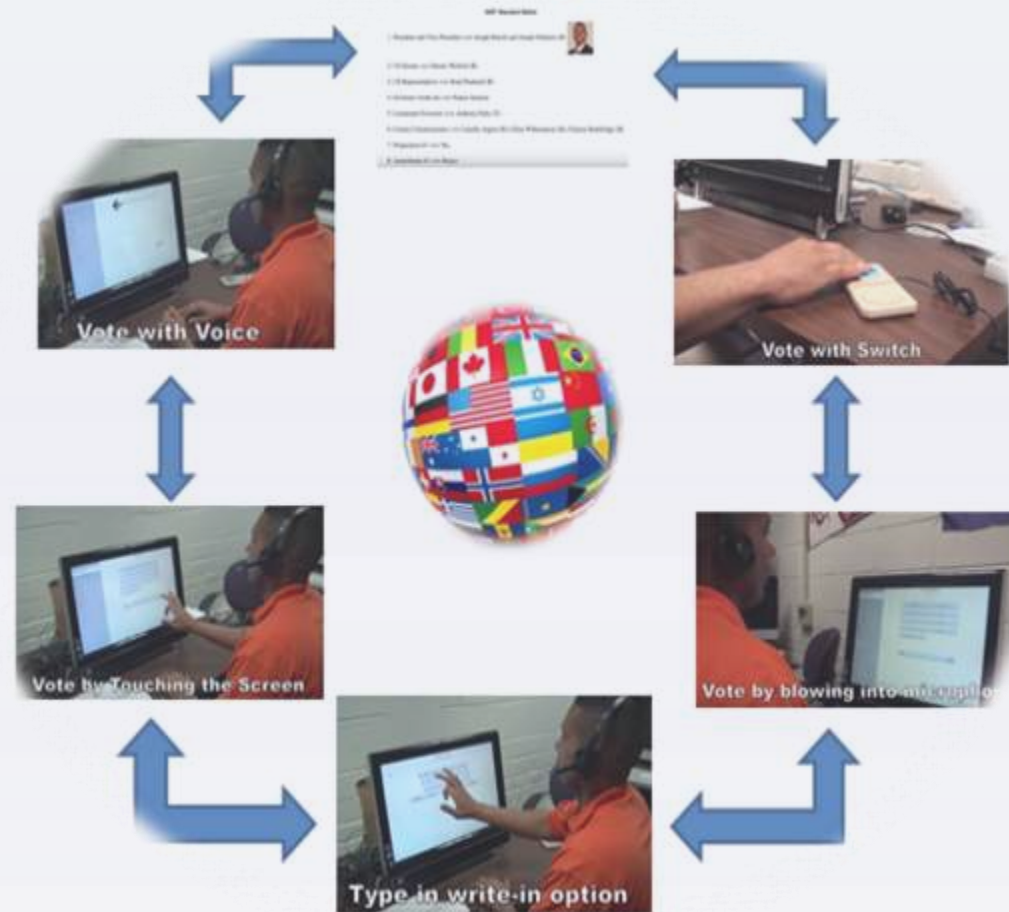
We chose Spanish because is one of the most outspoken languages in US with more than 37 million speakers [2], [3].
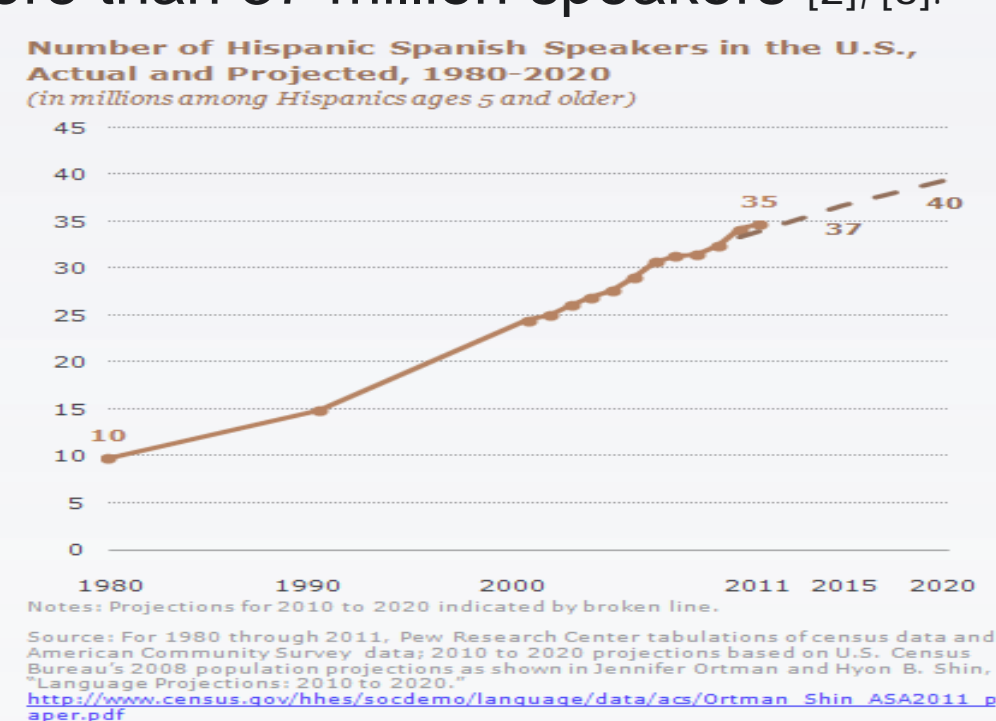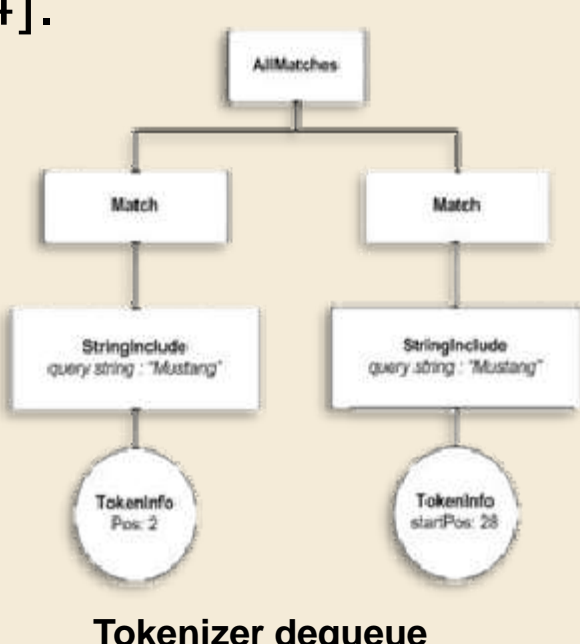

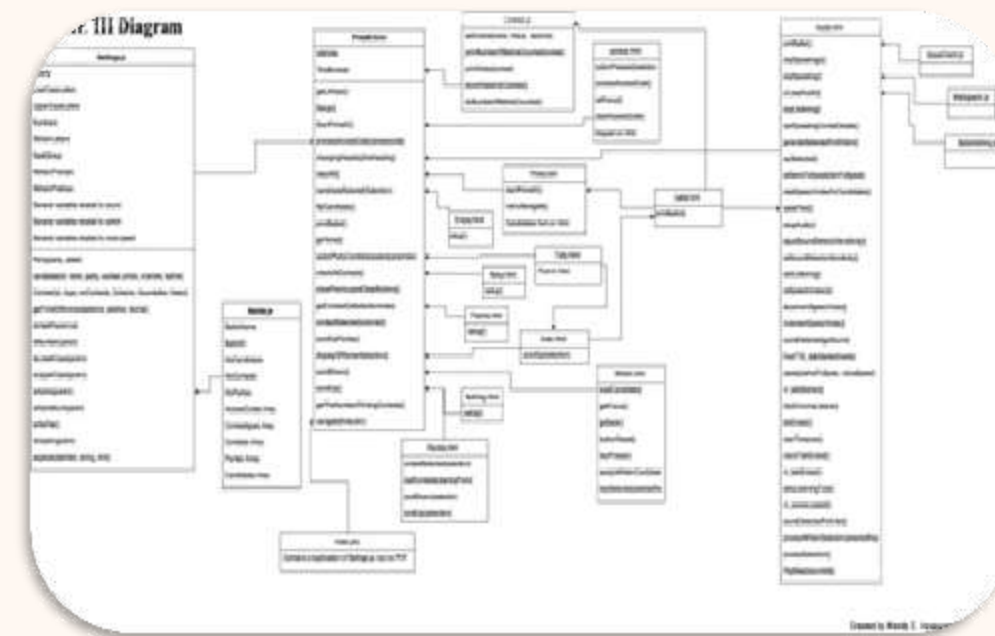Translation algorithm for Prime III Algorithm include:
- Analyzing
- Documenting
- Designing
- Implementing Multilanguage capability

1.- Prime III Structure

2.- Duplicating the GUI Code of Prime III

4.- Development of a Translation Object

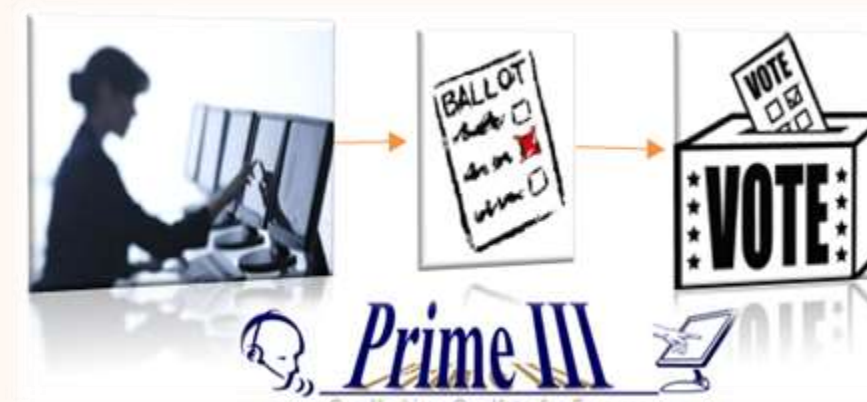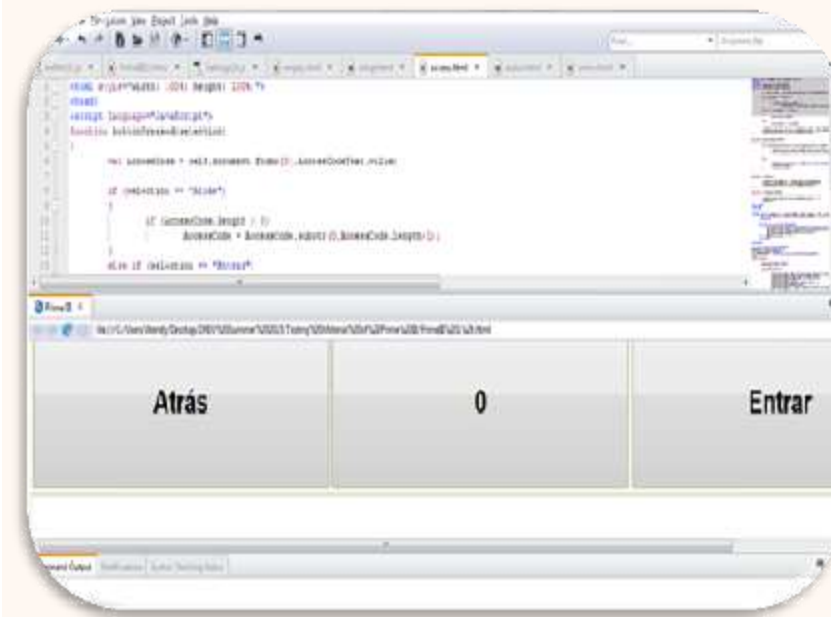### 3- Testing functions using Google API code for Translation

Background

- Broadening systems and having them with more abilities has been of a great increase in the last years of studies [4].

- While we considered methods available such as code duplication and testing API code none of the methods were right for us.

- Our method is similar to Tokenizer dequeue [4].

Tokenizer dequeue

Results

- The success of incorporating a second language gives a starting point to incorporate many more languages into the system.

- Once is incorporated into Prime III, it will expand the accessibility to more people.

Conclusion
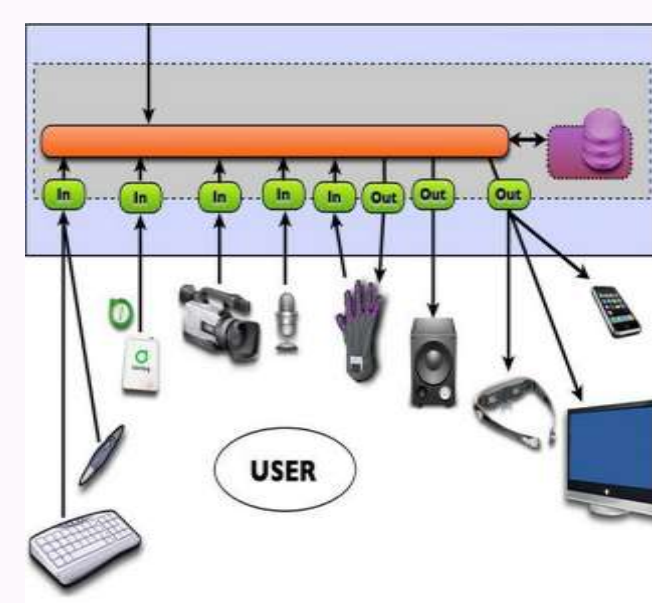
The importance of having systems that give an accurate translation, so users of such will not be misled by it.

Future Work

- Implement the translation object as part of the functionality of Prime III
- Evaluate and analyze other methods of translation

References

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[4]. Rojc, M., & Izidor M., (2011). "Multilingual and Multimodal Corpus-Based Text to Speech system –PLATTOS-" Speech and Language Technologies. 129-154.

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