MY SUMMER REU EXPERIENCE

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July 2015

ABOUT ME

Originally from Honduras, but now I live in Maryland

Undergraduate student at UMUC

And Yes, I got to see the Treasures of UF!

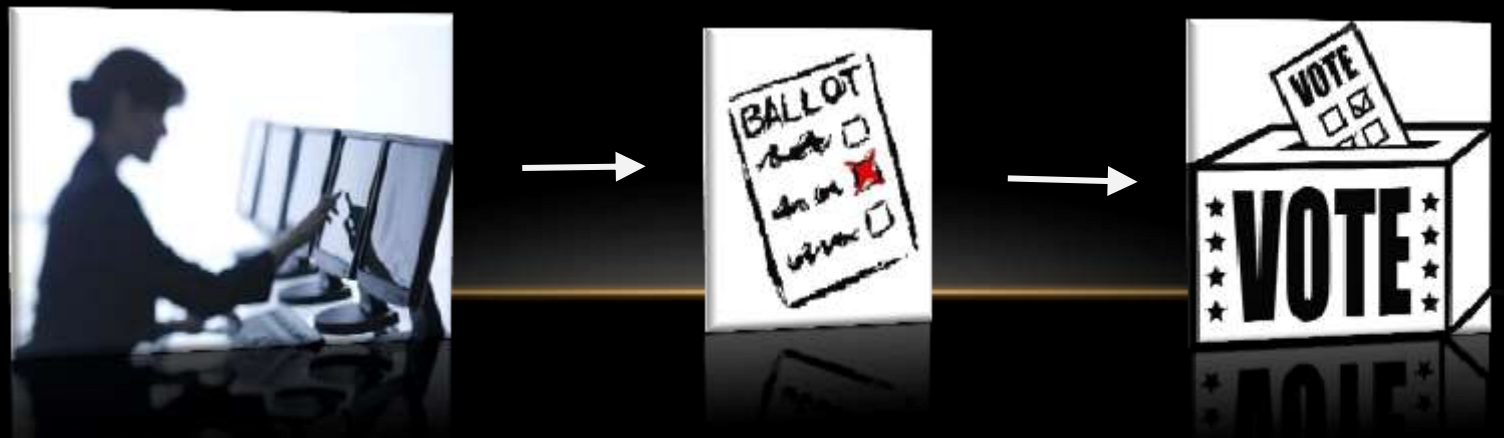
SUMMARY OF PROJECTS

- Prime III (Documenting, and implementing Spanish Translation)
- Research the advantages of Web Speech Recognition resources
- Work Collaborative in the development of an abstract paper for a Poster on Prime III
- Learned and Teach Lego Mindstorms NXT
- Designed and Created a personal Website for DREU Program

What's Prime III?

Prime III is an electronic voting system that emerges from an initiative to create an automated voting system better and innovative that could be accessible to everyone.

- **How Prime III Works?**



PRIME III DEMONSTRATION

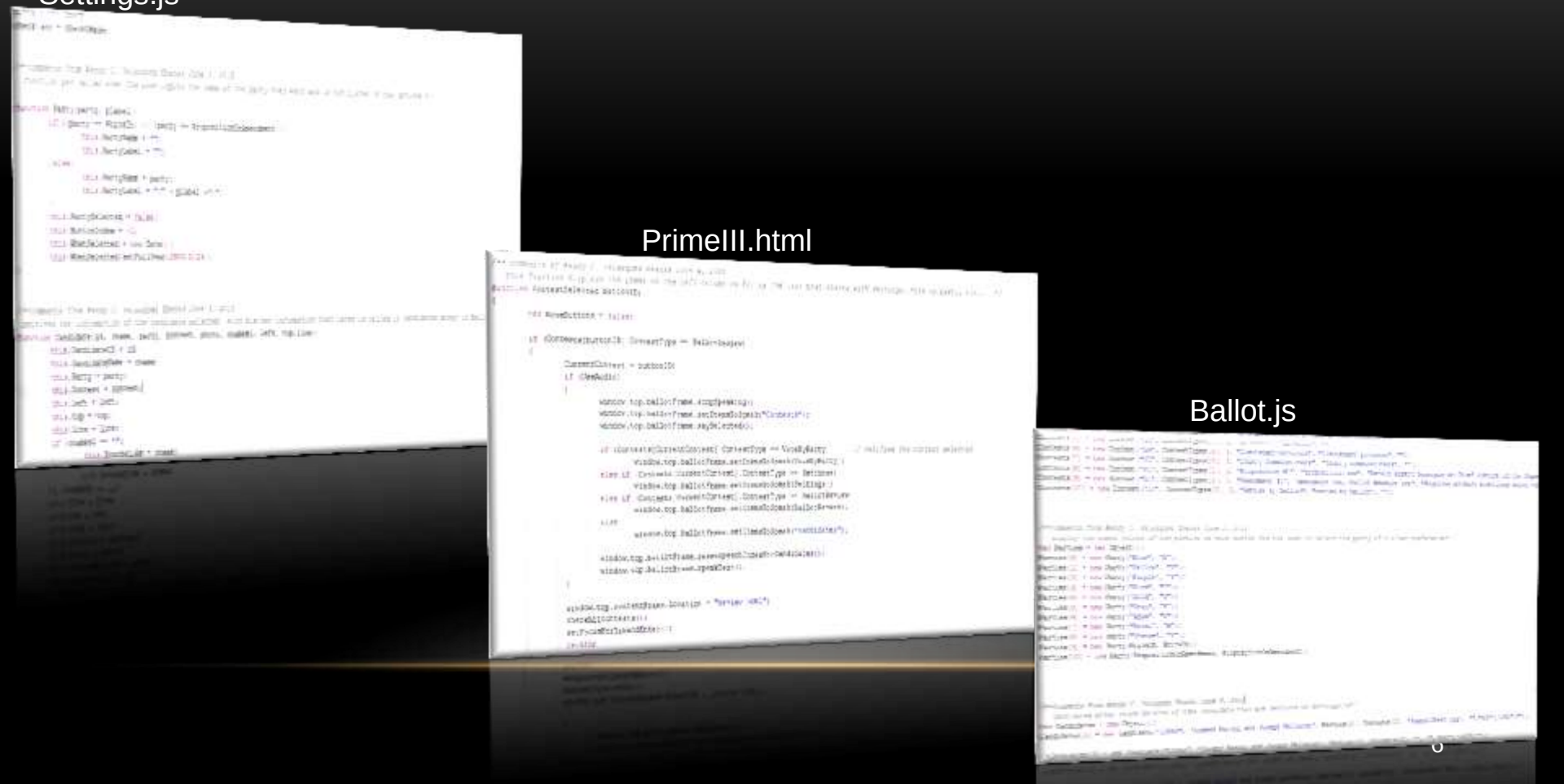
https://hxr.cise.ufl.edu/PrimeIII

UNDERSTANDING AND DOCUMENTING THE CODE

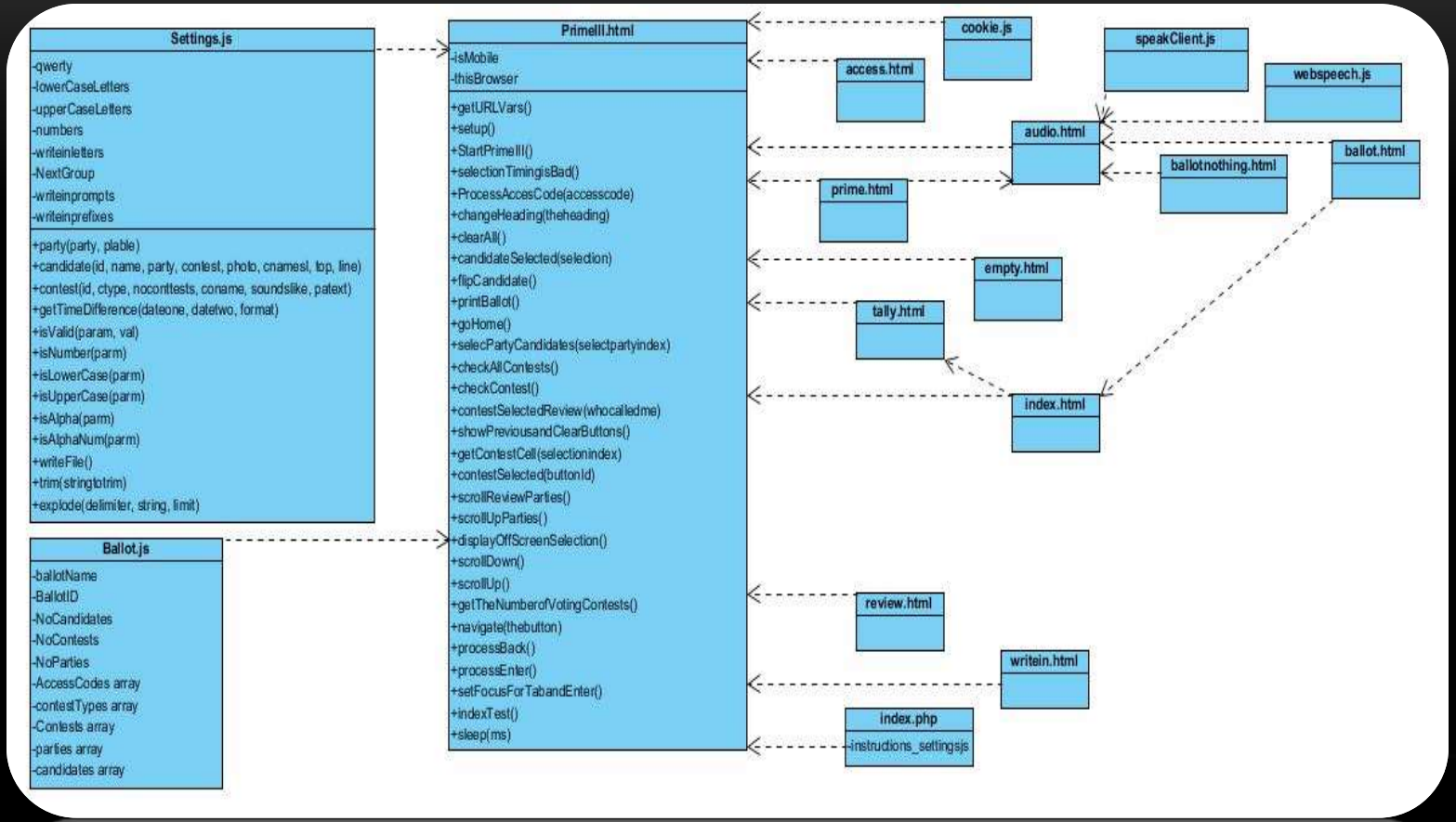
Settings.js

PrimeIII.html

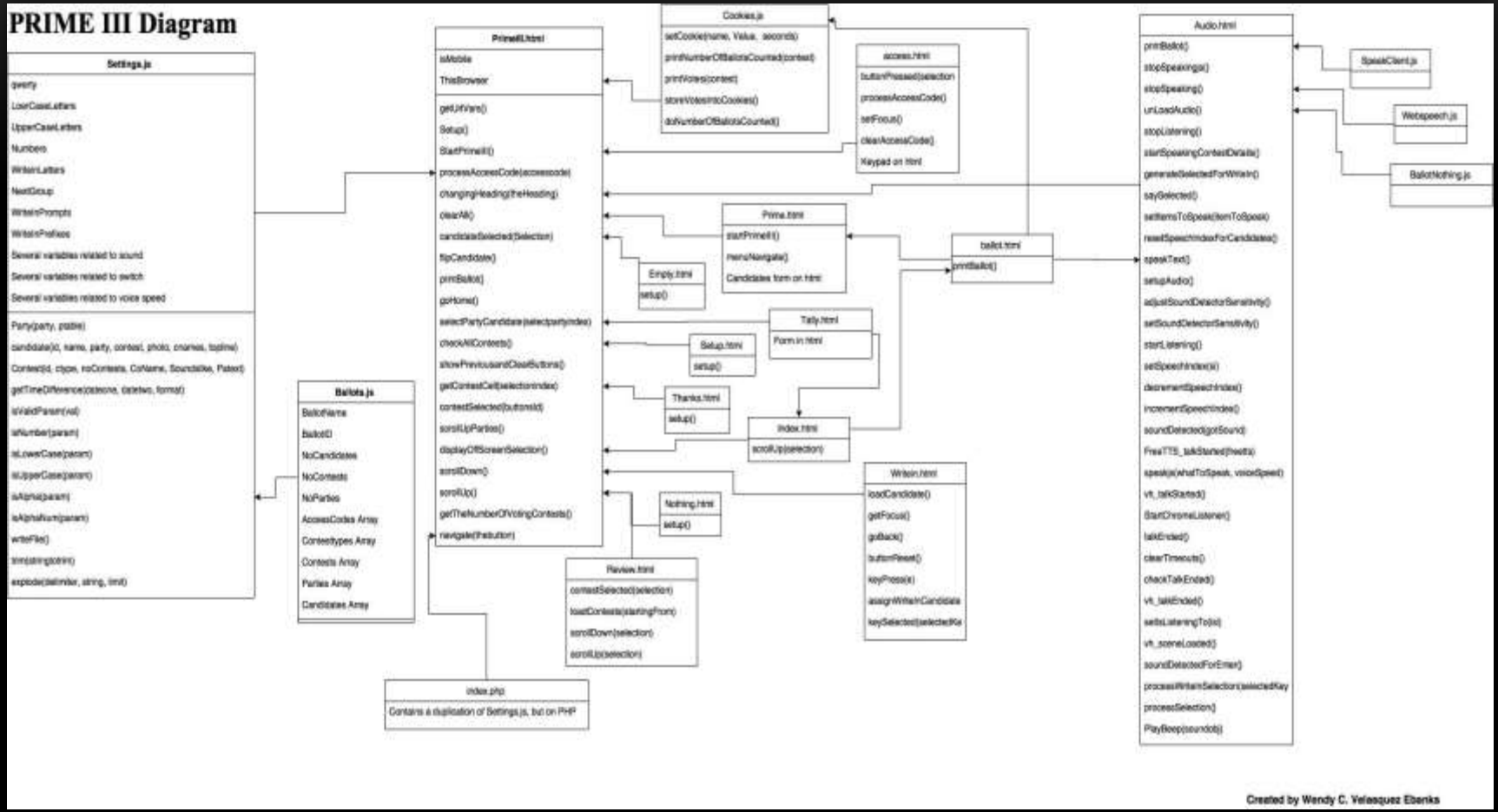
Ballot.js



PRIME III PRELIMINARY DIAGRAM



PRIME III


PRIME III Diagram
Settings.js
query
LowerCaseLetters
UpperCaseLetters
Numbers
WriteInLetters
NextGroup
WriteInPrompts
WriteInPrefixes
Several variables related to sound
Several variables related to switch
Several variables related to voice speed
Party(party, ptable)
candidate(id, name, party, contest, photo, cnames, toplime)
Contest(id, ctype, noContests, CoName, Soundalike, Patent)
getTimeDifference(datetime, datetwo, format)
isValidParam(val)
isNumber(param)
isLowerCase(param)
isUpperCase(param)
isAlpha(param)
isAlphaNum(param)
writeFile()
trim(stringtotrim)
explode(delimiter, string, limit)
Ballots.js
BallotName
BallotID
NoCandidates
NoContests
NoParties
AccessCodes Array
Contesttypes Array
Contests Array
Parties Array
Candidates Array
Prime8.html
isMobile
ThisBrowser
getUrlVars()
Setup()
StartPrimeIII()
processAccessCode(accesscode)
changingHeading(theHeading)
clearAll()
candidateSelected(Selection)
flipCandidate()
primBallot()
goHome()
selectPartyCandidate(selectpartyindex)
checkAllContests()
showPreviousandClearButtons()
getContestCell(selectionIndex)
contestSelected(buttonsId)
scrollUpParties()
displayOffScreenSelection()
scrollDown()
scrollUp()
getTheNumberOfVotingContests()
navigate(thebutton)
Cookies.js
setCookie(name, Value, seconds)
printNumberOfBallotsCounted(contest)
printVotes(contest)
storeVotesIntoCookies()
doNumberOfBallotsCounted()
access.html
buttonPressed(selection
processAccessCode()
setFocus()
clearAccessCode()
Keypad on html
Prime.html
startPrimeIII()
menuNavigate()
Candidates form on html
Empty.html
setup()
Tally.html
Form in html
Setup.html
setup()
Thanks.html
setup()
Index.html
scrollUp(selection)
Nothing.html
setup()
Review.html
contestSelected(selection)
loadContests(startingFrom)
scrollDown(selection)
scrollUp(selection)
Writein.html
loadCandidate()
getFocus()
goBack()
buttonReset()
keyPress(e)
assignWriteInCandidate
keySelected(selectedKe
ballot.html
printBallot()
Audio.html
printBallot()
stopSpeaking(s)
stopSpeaking()
unLoadAudio()
stopListening()
startSpeakingContestDetails()
generateSelectedForWriteIn()
saySelected()
setItemsToSpeak(itemToSpeak)
resetSpeechIndexForCandidates()
speakText()
setupAudio()
adjustSoundDetectorSensitivity()
setSoundDetectorSensitivity()
startListening()
setSpeechIndex(s)
decrementSpeechIndex()
incrementSpeechIndex()
soundDetected(gotSound)
FreeTTS_talkStarted(freetts)
speak(s)(whatToSpeak, voiceSpeed)
vh_talkStarted()
StartChromeListener()
talkEnded()
clearTimeouts()
checkTalkEnded()
vh_talkEnded()
setIsListeningTo(id)
vh_sceneLoaded()
soundDetectedForEnter()
processWriteInSelection(selectedKey
processSelection()
PlayBeep(soundobj)
SpeakClient.js
Webspeech.js
BallotNothing.js
index.php
Contains a duplication of Settings.js, but on PHP
Created by Wendy C. Velasquez Ebenks

PROGRESS

- Documenting and diagramming the structure of Prime III for better understanding as well as translating parts of the code into Spanish.
- Testing Functions in order to understand its functionality inside Prime III.
- Planning and developing the approach of the translation object for Prime III.

CHALLENGES

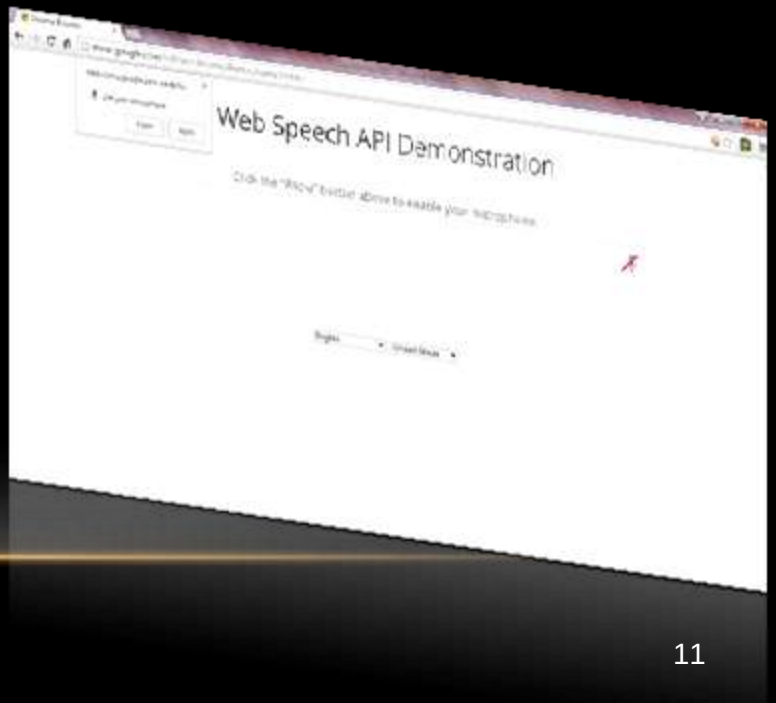
- Understanding the connectivity of the files that conform Prime III, without any documentation more than the code.
- Testing Methods to incorporate Google's API, but discarded because they use online Libraries
- Prime's structure was a challenge itself particularly when all files of this system are so close related to each other and connected to the main file, and knowing that if you disconnect one little thing it can make a cascade effect inside of the system.

GOOGLE SPEECH RECOGNITION FEATURE TESTS

Web Speech Sample to try

Comparison and differences inside the code

Web Speech Provided by Google



CODE DIFFERENCE BETWEEN GOOGLE DEMO AND SAMPLE CODE DEMO

Google code sample

Includes libraries online mostly

Demo code sample

Does not include the libraries on it

CREATING THE SPANISH DEMO USING GOOGLE API DISADVANTAGES:

- Internet connection is needed in order to Use Google API.
- Google API Functions manipulation need to buy a KEY ACCESS code
- Google Web translator Manager provides a code snippet that changes Prime III configuration, and only works with internet connection. It cannot be customized.

TRANSLATION USING GOOGLE API

Shows where the Google key is needed in order to manipulate the code for languages.

```
<head>
   <meta http-equiv="content-type" content="text/html; charset=UTF-8" />
    <title>Translator</title>
</head>

<body>
    <script src="https://www.google.com/jsapi?key=YOUR_GOOGLE_KEY"></script>
      <div id="languages"><p>
  <a href="?lang=en" rel="en">English</a> /
      <a href="?lang=es" rel="es">Spanish</a> /
      <a href="?lang=it" rel="it">Italian</a> /
      <a href="?lang=fr" rel="fr">French</a>
</p></div>

    <div id="languageBlock">
```

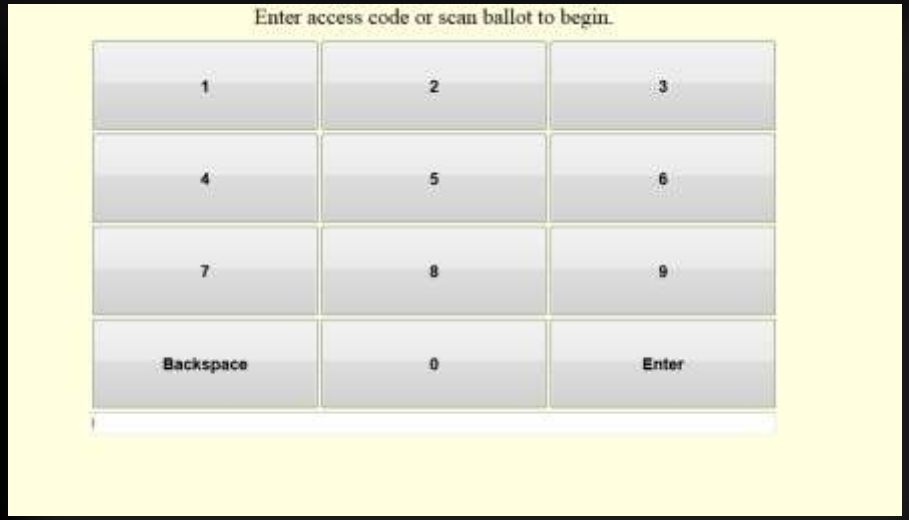
USING WEBSITE TRANSLATOR CODE SNIPPET FROM GOOGLE

```
<div id="google_translate_element"></div> <script type="text/javascript">
    function googleTranslateElementInit() {
        new google.translate.TranslateElement({pageLanguage: 'en', layout: google.translate.TranslateElement.InlineLayout.SIMPLE},
                                              'google_translate_element');
    }
</script><script type="text/javascript" src="//translate.google.com/translate_a/element.js?cb=googleTranslateElementInit"></script>
```

Code Snippet provided by Google Website Manager, that could be plugged into the code of prime III, but change its configuration, and requires the internet to work properly.

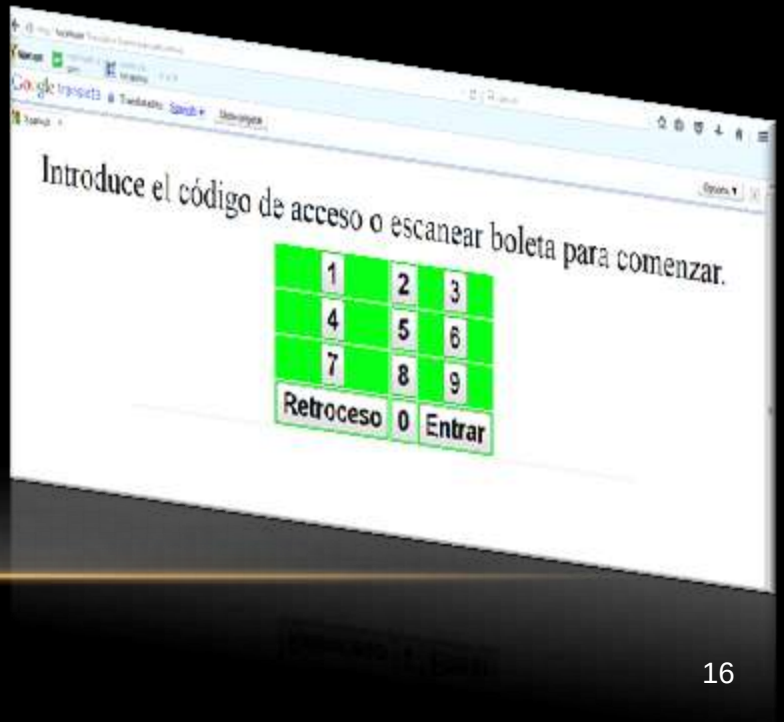
TRANSLATION USING GOOGLE API

Prime III Original Graphical User Interface



It changed the GUI of Prime III

Prime III Using the code Snippet from Google



GRAPHICAL VISUALIZATION OF THE TRANSLATOR

Object
Access Code
Spanish Translations (Lang) “Enter”-> “Entrar”; “Back”-> “Atrás”; “Start voting”-> “Iniciar Votación”;

Data Structure		
Index	**Language object**	
0	Access Code “0000”	EN
1	Access Code “1111”	ES

A statement like this will be place call on Prime III:

Translator.get(“InnerHTMLtext”);”

PRIME III SIMULATION

The user enter a pass code and automatically gets recognized to which language it has to be translated. In this case Spanish is the only additional option.

EXPECTATIONS ON PRIME III BY THE END OF THE SUMMER:

- Create the translation object and test that it works. If time allows, incorporate the translation feature into Prime III, first with the Spanish language.
- Give back the files of Prime III already documented along with the Diagram that describes its structure.

SUBMITTING A POSTER ABSTRACT FOR PRIME III

Title:	Coding Multilingual Capabilities on a Multimodal Platform: The Challenges and Experiences
Paper	
Author keywords:	Prime III Voting System Multi-modal Platform Multilingual Platform accessible
Topics:	Human-Computer Interaction
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 front-end and back-end 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.
Time:	Jul 04, 01:51 GMT

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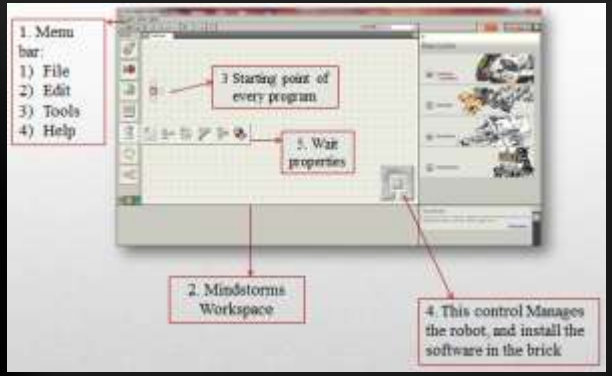
The notice of acceptance for this will be known until August the 14th.

MINDSTORMS NXT

Learning and Teaching Experience with Lego Mindstorms

MINDSTORMS NXT

Learned equipment, and software



DREU WEBSITE PROJECT

One of the requirements of the program that brought me to UF to do research was to create a website, on which I could describe my entire work for the summer.

Parts of the code and the actual website look and link to it are in the following slides.

DREU WEBSITE CODE

CSS file

JavaScript file

```
function displayweek1(){
        document.getElementById('hidden').style.display = 'block';
          $("#week2").hide();
          $("#week3").hide();
          $("#week4").hide();
          $("#week5").hide();
          $("#week6").hide();
          $("#week7").hide();
          $("#week8").hide();
          $("#week9").hide();
          $("#week10").hide();
          $("#week1").show();
}

function displayweek2(){
        document.getElementById('hidden').style.display = 'block';
              $("#week1").hide();
              $("#week3").hide();
              $("#week4").hide();
              $("#week5").hide();
              $("#week6").hide();
              $("#week7").hide();
              $("#week8").hide();
              $("#week9").hide();
              $("#week10").hide();
              $("#week2").show();
}
```

Pieces of what the code for the personal website looks like

DREU WEBSITE

http://hxr.cise.ufl.edu/HXRL/Wendy/index.html

THANKS TO SUCH AN AMAZING TEAM

From left to right (Elizabeth Mathews, Wanda Eugene, Wendy Velasquez Ebanks, Juan Gilbert, Tiffanie Smith, Edward Dillon and Andrew Garrett)

ACKNOWLEDGMENTS

The following organizations made my internship possible:

- **DREU:** Distributed Research Experiences for Undergraduates.
- **CRA-W:** Computer Research Association's Committee on the Status of Women in Computing Research.
- **CDC:** The Coalition to Diversify Computing
- **NSF:** National Science Foundation
- **iAAMCS:** Institute for African-American Mentoring in Computing Sciences

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