Multi-Factor Identity Authentication Device

Authentication step KEYS:

* Accepts a pin
* Accepts a voice (make sure the voice is recognized)
* Gets and Displays the GPS coordinates

High Level Design/ Pseudocode

* Give a greeting to the user (MENU)
* Ask the user if they are a CURRENT user or NEW user
* If they are a current user, go to the current user module
* If they are a old user, go the new user module
* CURRENT User
* Ask for the USER’s name
* Ask for the user’s phrase (have them say a phrase)

Analyze the phase for the frequency components

Compare the frequency components with the stored components

If the frequency components does not match, ask the user’s phase again

If the user’s frequency components does not match after three tries,

Print message “Voice not recognized, return to menu”, return to menu

If the frequency components match, greet the user’s name printing the name

ex) “Hello (User’s Name)

* After the voice is matched, ask the user enter a pin code

If the pin code is not matches to the user, ask for the user’s pin again

If the user’s pin is not recognize after three tires,

Print message “Print not recognized, return to menu”, menu

If the pin number is recognized, print the message “Pin access Authorized”

* After the user voice and pin has been approved, print the GPS Coordinates

Print “Your GPS coordinates are time:(!) longitude:(!) latitude:(!)”

Print “Congratulation you are Authenticated”

* NEW User
* Ask the user to type the name

Store the name

* Ask the user to speak a phase (SUBJECTIVE)

After the user speaks a phase, store the phase, (7 to 15 words), including saying the USER’s name

Repeat the process until you stored three phases from the same user

Analysis the voice, and store the voice frequency compentons

Note: the frequency components will be the comparison not the voice

* Ask the user for a four-digit pin code

Confirm the four-digit pin code (Compare)

If the four-digit code matches, confirm and store

If the four-digit code doesn’t match, Go back to the four-digit module

Store and save the four digit pin

* Return to the MENU

Takeaways

How big the frequency brands are for each component?

How many components need to match?  
Frequency range? [Human Frequency]

Hypothesis testing will evaluate ….

More Research ….

1) The simple speaker identification/authentication is based upon the different spectrums for each person's voice. So, read up on the range of frequencies for the human voice and how large each band should be.

2) Search for some existing FFT analysis programs that match the platform you will be using.

3) Read about hypothesis testing (sometime under H0 andH1) for the ideas of True Positive, True Negative, False Positive, and False negative.. Look for the term EER (Equal Error Rate) to evaluate speaker authentication.