Research Projects
Caribbean Artificial Intelligence Group

Primary Considerations before you read on:

1) We have a lab – but no computers – this means you need to work on your laptop. What we do have is:
   a. Microphones to experiment with Digital Signal Processing (array microphones – pressure microphones)
   b. Plasma displays for life-like display of avatars
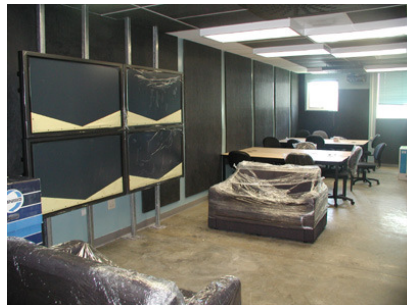   c. Directional speakers

| a | b | c |

2) There are two advisors (check it out on ai.pupr.net) – we don't speak Spanish
3) There is no money

Secondary Considerations:

1) If you work with us successfully then you can register for undergrad research after the fact to get credit. Risk free!
2) If you really like what you are doing and feel comfortable with it, register for two semesters of capstone to proceed.
3) If everything goes well, then this will help you to apply for summer internships or graduate school, because you already have undergrad research experience.
4) You might enjoy it

The Projects:

Speech Recognition
Toolkit HTK can be used to put together a speech recognition tool. Search for Cambridge and HTK on the web and join the group to download all the tools. Make your own yes/no recognizer. Then come join the group and build a speech recognizer that can understand more complex sentences. Perhaps build a system that can work with Spanish or English? No programming skills required. Only interest in subject and a linux system on your machine.

Speech Synthesis:
Toolkit Festival can be used to put together a machine that says a sentence that you type in. Search for Festival and Edinburgh on google. Download the software and make the computer talk. Then join us and make it talk in Spanish. And then make it talk in Puerto Rican Spanish. We'll help you get set up with our friends in Edinburgh to get guidance.

Image recognition:
Grab your favorite camera (ours has been stolen) and do some research on the internet to find the best toolkit to do face recognition. Then come join the group and use your tool to recognize who walks in the door of our lab.

Avatars:
Choose your favorite tool to generate avatars that can talk to people in the room. Display it on the megascreen. Make it move, make it talk, make it engage in a dialogue. Work with the chatbot project.

Chatbot:
Learn how to fake a dialogue, how to acquire information and keep up a dialogue with a stranger or a person you know well. Attach this to any of the other projects. Look up chatbot and ALICE on the web to find out more.

Cognition:
Work on Delphi code to reverse engineer this work done in Germany on human cognition. How does a Human generate emotion? How does that effect his actions? Apply this to the avatar.

Merge Virtual world and reality to learn:
http://www.vlearn3d.org/ -- find collaboration partners internationally

If you prefer Math – talk to Armin – he can generate any number of very mathematical research projects - Usually on Neural Networks.