



## Senior Design Project in Electrical & Computer Engineering



# Optimizing Mobile Biometrics Data Network

Cadets 1/c Donatas Siaudinis and 1/C AI Sowers

Advisors: LCDR Pickles

Sponsors: USCG TISCOM



**Project Goals**

- Implement and present a solution of optimizing the transfer of the biometric files from the USCG cutters to the US VISIT database that meets the following requirements:
  - Reduction of air time of very expensive satellite connectivity.
  - Increase in reliability and in speed of biometric data transfer.



### Project Objectives

- Decrease satellite air time to reduce the cost of internet connectivity underway.
- Increase the speed of service.
- Increase accountability and information assurance of the biometric files transfer.

### Project Background "Biometrics-At-Sea"

Since November 2006, the USCG has been exercising the Biometrics-At-Sea project, which utilizes the ability to keep track of the interdicted immigrants in Puerto Rico. By transferring their biometric data to the US VISIT database of all the US visitors, the USCG is able to record every immigrants' attempt to enter the US illegally. Thus, any high priority/interest person or multiple immigration offenders can be identified during the interdiction process.

### Current Method

The current biometric data of one person consists of two index finger prints and one facial portrait. The average biometric file is roughly 100 kB in size. Currently, the data is transferred to the US VISIT via the Microsoft Exchange Server. The information for one person is simply being attached to an email and sent to the US VISIT through a server of the ship. After analyzing the files with their database, the US VISIT reports the results back to the cutter through the USCG Sector via radio communications.



The above diagram is the proposed design solution for the biometric files transfer. Instead of sending one email per person, all files per interdiction will be transferred at once using the USCG MLCA's large file transfer method: On cutter (1), all biometrics will be zipped and uploaded on the MLCA server (3) using satellite connectivity (2). From (3) files automatically reach USCG Station (4) where they will be unzipped and transferred to the US VISIT (5) by emailing each biometric file individually. Then, (5) replies back the results to the Station (6) which reports back to the (1) via radio communications.

### Importance For The Coast Guard

It is necessary to optimize the current Biometrics-At-Sea project because it depends on the satellite connectivity which costs \$5.60 per minute. Therefore, the USCG has to pay up to \$21,000 per month per cutter for the connectivity only. Also, in case of the interdiction of 100 immigrants, a transfer of one biometric file per immigrant takes a long time which significantly thins the USCG wallet.



### Future Plans

Create a prototype of a proposed system design using computers as the stations through which the biometric data has to be transmitted to reach its destination.  
Test the proposed system on the 110' cutters in Puerto Rico.

### Current Status

Building and testing a mock Biometric s-At-Sea system in PECE Lab.

### Project Timeline

- FEB 20 – MAR 6:** Setting-up the prototype system for lab testing
- MAR 7 – MAR 16:** Spring Break '08
- MAR 17 – MAR 25:** Test connectivity between 110' cutter and MLCA
- MAR 27 – APR 1:** Test ability to retrieve files from the MLCA
- APR 3 – APR 8:** Testing connectivity between Sector and US VISIT
- APR 10 – APR 14:** Testing the entire system in the lab
- APR 17 – APR 27:** Testing the system on the fleet
- APR 30 – MAY 1:** Project Presentation