## Embedded Microcontroller Design Project

# Smart Fabrics

## Mission Statement

To design an emergency rescue raft that integrates existing technology into smart fabric creating a more reliable product during life threatening situations.

## Synopsis

After researching existing tent and raft design technologies along with the use of "smart" fabrics the design of an enhanced emergency sea rescue raft became the focus of this project.

For the raft a tent like structure was chosen, which correlates with the most successful current raft designs, and which will provide shelter from the harsh elements out in the ocean.

In the rescue raft market a RF transmitter is rarely attached to the raft. It this design it was desired to integrate a transmitter, which would send out our location coordinates, of the actual raft itself providing a detailed location for rescue. The raft incorporated GPS signaling capabilities so that the user would be able to track their coordinates, and then send these coordinates out through an RF antenna to nearby rescue centers.

Additonally the walls of the rescue raft have fiber optic fabric panels. These panels alternate with solar fabric panels on the exterior of the raft. The fiber optic panels are attached to a sensor on the top of the raft, which is triggered through the presence of low light. The purpose of these panels is to create a SOS signal that will begin in the evening.

Along with the solar panels piezoelectric fabric will be used. By integrating the piezo electric fibers into the flooring and flag fabric of the raft, any movement from the waves/wind of the ocean would create energy.

All energy created can then be stored in batteries that would also be integrated into the fabric to power any electronics used within the raft. Using 3D printed battery cells the energy generated from the solar panels and piezoelectric fabrics would charge the battery cells lined on the inside of the emergency raft. This creates a self-sustainable rescue raft for any duration of being lost at sea.

The team was able to create a working prototype.

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