

Project Topics

-Partial List

EECE401 Senior Design I

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Design Project Topics

- Intel Cup (x2)
- Smart Meter
- Swallowable Capsule Technology (X2)
- Fiber2Ethernet Interface
- Fill the blanks by Team
- REMINDER – Project Proposal Submission**
 - Complete Proposal**
 - Paper submission: W 12OCT2011 4:30pm
 - Electronic (MS Word DOC file) Submission: W 12OCT2011 6:00pm

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Example:

Portable Perimeter Detection and Monitoring (PopDAM)

- **Background**
 - Blind spot detection and recognition of friend vs foe in closed perimeter for soldiers
 - Proximity alarms and monitors in unknown neighborhood would reduce casualties
- **Problem (Objectives)**
 - Present plan and produce some portion of demonstration prototype for a backpack contained wider proximity alarm and monitoring system
 - Integration of established technologies
 - Power consumption must be minimized or solar powered
- **Requirements**
 - A suite of sensors for various forms of detection (motion, sound, temp, vision, etc)
 - Detection range: 15 – 30 ft
 - Operating Temp: -10 – 25 Celsius
 - Night time image detection
 - Classification of friend and foe
 - Wireless communication
 - Batter Power: 12Vdc, 100Ahr
- **Deliverables**
 - Demonstration Prototype

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Intel Cup 1

- **Team Members**
 - Christopher Urquhart, Joshua Durodola, Nate Simms
- **Background**
 - Visually Impaired Individuals have trouble navigating through their environment
 - They also are hindered from using modern technological devices that would assist them in their daily lives
- **Problem (Objectives)**
 - To design and build a system that would help visually impaired individuals navigate in unfamiliar environments
 - Also the system should work as a personal digital assistant, helping them in their everyday lives
- **Requirement**
 - Object Detection range from 1" -10'
 - Battery life 72 hours in standby mode and 24 hours in operational mode
 - Detect acceleration above 1m/s
 - Operate using 10 V/DC at 5 A
 - System should weight no more than 5 lbs
 - Read typed text of 12 font at a max distance of 2 feet
 - Recognize 30 different pedestrian signs
 - Recognize a curb drop off at least 1.5 m in front of user
 - Recognize 50 different Voice Commands
- **Deliverables**
 - We shall have a fully functional working prototype

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Intel 2 - Lighting Efficiency

- **Team members**
 - Ameer baker
 - Shamir Saddler
 - Chidi Ekeocha
- **Background**
 - Today, about five percent of the energy used in the nation is for lighting our homes, buildings, and streets.
 - Lighting represents as much as 25 percent of the home's electrical use, so it is a significant part of one's monthly utility bill.
 - Since lighting represents as much as 25 percent of an office buildings electrical use, increasing your lighting efficiency is one of the easiest and fastest ways to lower a companies energy bills.
- **Problem (Objectives)**
 - Implement a system that measures the light intensity outside and inside the office, and regulates the intensity of the lights throughout out the office to maintain a standard level of light intensity for employees to be able to work undisturbed
- **Requirements**
 - Outdoor light sensors for gathering information on the intensity of the light from the sun
 - Indoor light sensors for gathering information on the intensity of the light within the room
 - Control System for the calculation and comparison of light intensity
 - Light Control System to vary the intensity of light inside
 - Relay that could high voltages
 - Automatic Window blinds (Optional)
- **Deliverables**
 - Outfit a room with the proposed system to illustrate its functionality and calculate by hand how much it will cut energy costs overtime dependant on the newly reduced power consumption

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Fiber2Ethernet

- **Team Members**
Damola Alabi, Andrew Hillocks, Jasmine Little, Montaque Jones
- **Background**
 - To allow multiple networks that are using different kinds of cables (i.e. fiber & Ethernet) to communicate with each other.
- **Problem (Objectives)**
 - The problem we are faced with is as follows: to design an interface that will help close the generation/technology gap by enabling the use of optical fiber technology on Ethernet enabled technology by means of an adapter.
- **Requirement**
 - Overall Function: To Convert high speed (Gigabit range) fiber optics to Ethernet
 - Performance: LED indications.
 - Compliance: F2E should meet the electrical requirements as stated in most recent version of the IEEE 802.3 standards
- **Deliverables**
 - Demonstration Prototype
- **NOTE: Mr. Gregory West (Northrop Grumman will present on 12/19/11) -ck**

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Capsule 1

- **Team Members**
 - Cimoya Collins
 - Gilbert Hopkins
 - Michelle Lilley
 - Ashley Wells
- **Background**
 - These electronic microcomputer systems are now able to explore the Gastrointestinal tract
 - Can transmit the information (temperature, images, pressure, and pH data) that was obtained through the sensors to an output
- **Problem (Objectives)**
 - To design a micro-system that has a low transmit power, to the point where the interference with hospital equipment and other wireless signals are minimized
 - Maintain a power strong enough to ensure a signal connection with the receiving component
- **Requirements**
 - **Internal Design of the Capsule:**
 - Sensor
 - Signal Conditioner
 - Power Supply
 - Standard:
 - » Medical Implant Communication Service, operating in the 402–405 MHz range
 - » Industrial Scientific and Medical bands such as 433.92 MHz are acceptable
 - Microcomputer
 - Communication system
 - **Average Body Temperature:** 97.9° F
 - **Wireless communication**
 - **Size:**
 - Capsule: 1 cm wide
 - Thickness of Camera: 1.4 mm
- **Deliverables**
 - Images of GI tract within a team members body
 - Demonstrate how the interference of the wireless signal was minimized

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Capsule 2

- **Team Members**
 - Brima Bah, Kurubel Medemdemia, Bathiya Senevirathna
- **Background**
 - Swallowable capsules are endoscopic devices that are ingested and collect temperature, pH level, and pressure data of its environment, and also takes images of its passage through the gastrointestinal (GI) tract
- **Problem (Objectives)**
 - Propose a design of a safe, multi-sensor capsule that provides real-time temperature, acidity (pH), and pressure data
 - Capsule should also provide images of the GI tract in real-time and be designed for one-time usage
- **Requirements**
 - **Maximum Size:** 9 mm diameter, 23 mm length.
 - **Minimum Data Measurement Rates**
 - Temperature: 1 reading / 20 sec, Range: 10-70 ± 0.5°C
 - Pressure: 1 reading / 2 sec, Accuracy: ±3.6 mm HG
 - Acidity (pH): 1 reading / 2 sec, Range: 0-14 ± 0.28
 - Image: 2 frames / 1 sec, 640x480 resolution
 - **Battery Life:** Minimum 8 hours
 - FCC compliant, Eventual FDA approval
- **Deliverables**
 - Detailed design of capsule

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