



**FAMU-FSU**

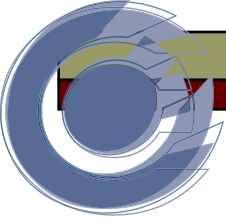
**College of Engineering**



# **ECE Senior Design Course 2012-2013**

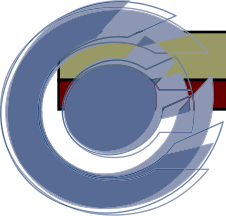
**EEL 4911C  
Senior Design Project I  
Fall Semester, 2012-13**

**Instructor: Dr. Michael Frank**



# List of This Year's ECE-Staffed Senior Design Projects

#	Name	Led by	Includes	Notes
1	SoutheastCon Robotics	ECE <sub>(ME)</sub>	ME	Competition
2	Solar Car	ECE	ME	Competition?
3	RoboSub AUV (?)	ECE (?)	ME	Competition
4	Cosmic Ray Detector	ECE	ME	Sponsored research
5	Marine Drifters	ECE		External customer
6	Oil Spill Detector	ECE	ME	External customer
7	Turfgrass Impact Tester	ECE		External customer
8	NASA Lunabot	ME	ECE	Competition
9	FIPSE-1/Drone (Brazil)	ME	ECE	International
10	CanSat (small satellite)	ME	ECE	Competition



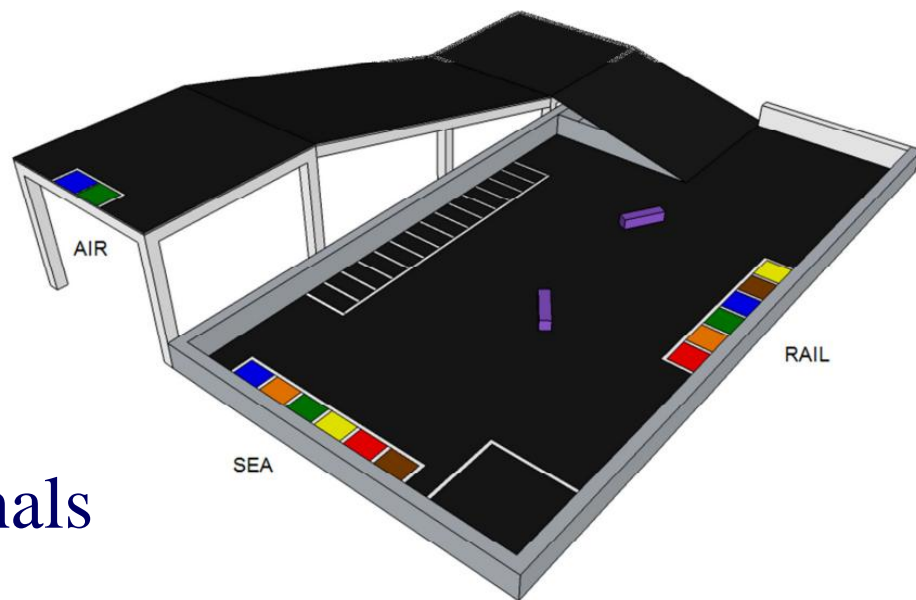
# IEEE SoutheastCon 2013

Project  
#1 (of 10)

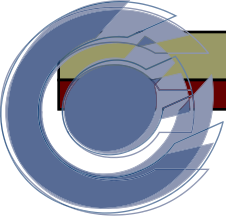
## Student Hardware Competition

- Autonomous robots
  - Move “cargo” blocks to “terminal” locs.
- Local competition
  - 6 teams (1 ME-led)
  - Winner goes to regionals
- Rules, FAQ & link to Facebook group
  - <http://ta.gd/SEcon13>

Project Advisor: Dr. Harvey

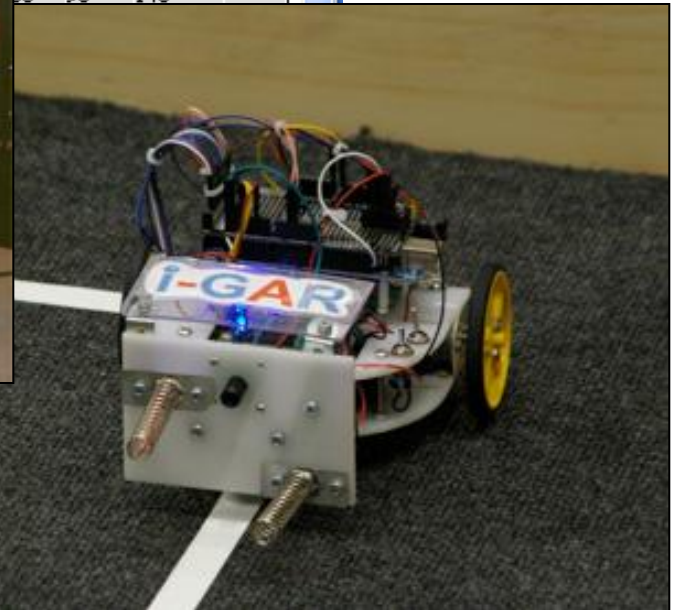


(4-5 students per team -  
2 multidisciplinary teams  
w. 2 ECE, 2 ME)

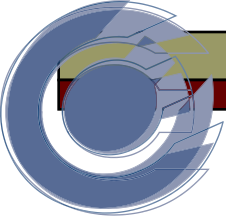


# SoutheastCon 2012: FAMU-FSU Victorious!

School Name	Team Name	Qualified	Run 1	Run 2	Run 3	Average	Final
<a href="#">FAMU-FSU College of Engineering</a>	i-GAR	Yes	560	560	550	556	550
<a href="#">University of Alabama at Birmingham</a>	University of Alabama at Birmingham	Yes	330	150	270	250	480
<a href="#">University of South Alabama</a>	57494E4E494E47	Yes	300	270	250	273	420
<a href="#">Auburn University</a>	Auburn SPaRC	Yes	150	350	320	273	380
<a href="#">University of West Florida</a>				80	210	233	380
<a href="#">University of Alabama</a>				40	350	323	360
<a href="#">Mississippi State University</a>				10	340	316	320
<a href="#">DeVry University - Orlando</a>				20	240	233	200
<a href="#">Western Carolina University</a>				10	210	180	
<a href="#">Murray State University</a>				80	130	173	
<a href="#">University of North Carolina at Charlotte</a>				0	220	150	
<a href="#">University of Tennessee</a>				00	90	146	
<a href="#">Pellissippi State Community College</a>							
<a href="#">UNC-Asheville</a>							
<a href="#">Virginia Military Institute</a>							
<a href="#">University of Florida</a>							
<a href="#">University of the West Indies Mona</a>							
<a href="#">Florida Institute of Technology</a>							
<a href="#">Western Kentucky University</a>							
<a href="#">University of Tennessee at Martin</a>							
<a href="#">University of North Florida</a>							
<a href="#">University of Louisville</a>							
<a href="#">University of Alabama in Huntsville</a>							
<a href="#">University of South Florida</a>							
<a href="#">University of Memphis</a>							
<a href="#">Georgia Southern University</a>	Tiger Robotics	Yes					
<a href="#">Christian Brothers University</a>	Eagle Robotics	Yes					
<a href="#">North Carolina A&amp;T State University: School of Technology</a>	CBU Robotics	Yes					
<a href="#">Bethune-Cookman University</a>	AggieBot	Yes					
<a href="#">Clemson University</a>	Bethune-Cookman University	Yes					
<a href="#">University of Kentucky</a>	Clemson University	Yes					
<a href="#">Tennessee Technological University</a>	University of Kentucky	Yes					
<a href="#">Embry-Riddle Aeronautical University</a>	TTU-Eagle	Yes					
<a href="#">Virginia Tech</a>	Eagles	Yes	100	110	90	100	
<a href="#">University of Evansville</a>	Virginia Tech	Yes	100	100	100	100	
<a href="#">Savannah Technical College</a>	BIUE	Yes	110	100	90	100	
	Savannah Technical College	Yes	90	90	120	100	







Project advisor: Dr. Zheng / Dr. Foo (ME advisor TBD)

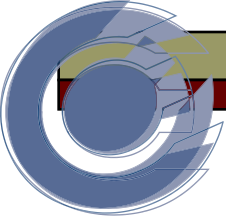
Project  
#2 (of 10)

# Solar Car

(4 ECE, 2 ME)

- Continuing project
  - 4<sup>th</sup> consecutive year
  - Eventually enter into American Solar Challenge, or Shell Eco-Marathon?
- Vehicle worked last year
  - Batteries now bad though
- Some possible upgrades for this year:
  - Replace batteries, more efficient motor & solar cells, add fuel-cell energy storage?
- Major funding will likely be needed
  - Sponsorship inquiries pending (FREEDM, Shell, *etc.*)
  - Students should continue helping to seek outside funding





Project Advisors: Dr. Harvey, M. Greenleaf

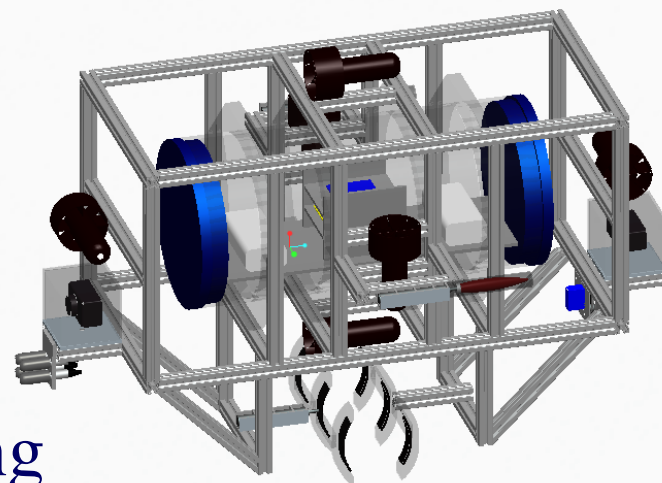
(& ME tbd)

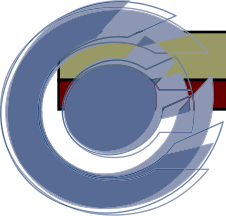
Project  
#3 (of 10)

## RoboSub (AUV)

(3 ECE. 3 ME?)

- Continuing project
  - This is year 3
- AUVSI int'l competition
  - <http://ta.gd/robosub>
- Almost completed last year
  - Reuse some parts this year
- Redesign work this year
  - A few new components
  - Extensive programming/testing





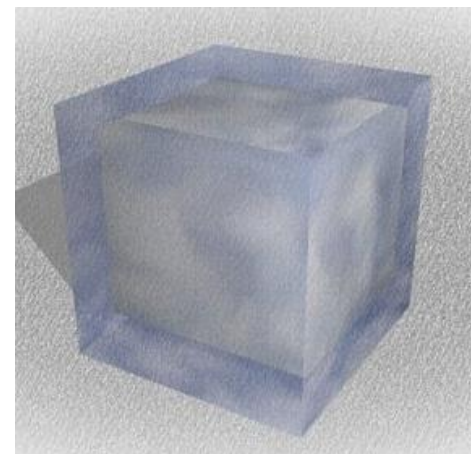
Project Advisors: Dr. O'Neal (FAMU Physics), Dr. Frank

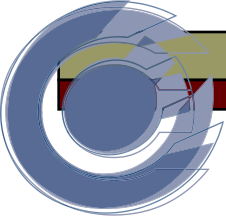
Project  
#4 (of 10)

# Cosmic Cube

(3 ECE, 2 ME)

- Follow-on to previous year's "COSMICi" project
  - Cosmic ray detector system
- Goal: Build a distributed network of low-cost particle detectors for cosmic-ray astronomy
  - This year: Compact, desktop-scale unit
- Detector electronics prototyped last yr.
  - Major new work needed in: Detector materials, photocells, system redesign.





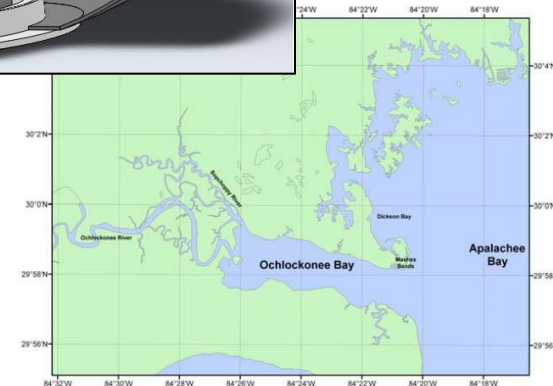
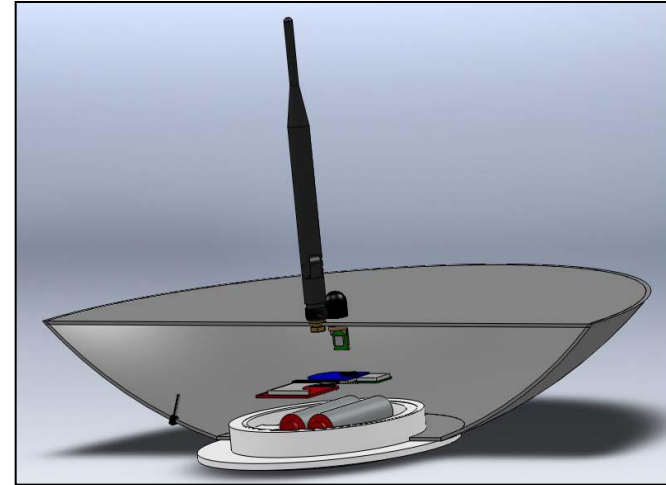
Project Advisors: Dr. Frank, Dr. Kevin Speer & others TBD

Project  
#5 (of 10)

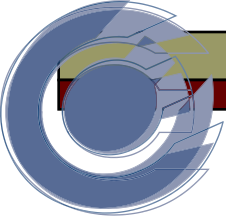
# Marine Drifters

(4 ECE)

- Sponsored by FSU Oceanography dept.
  - Continuation from last year's project
- Autonomous data-collection platform
  - GPS location, temperature data
  - Ad-hoc radio network
- Prototype partially completed last year
  - This year:
    - Much more programming/testing, design-for-manufacturing, possible reselection of MCU system







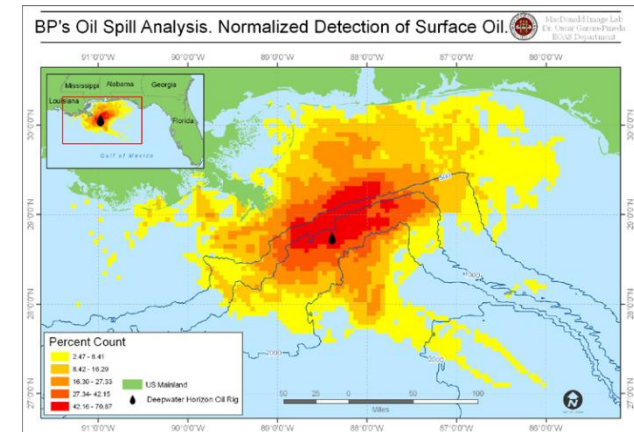
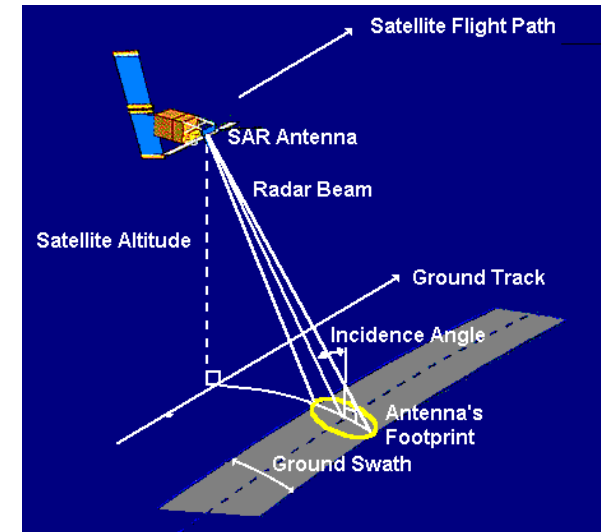
Advisors: Oscar Garcia (Oceanography),  
B. Harvey / M. Frank (ECE)

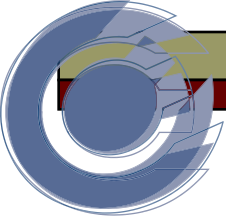
Proj. #6  
(of 10)

# Radar System for Oil Spill Detection

- Sponsored by FSU Oceanography dept.
- New project this year
- Satellites are used for synthetic-aperture-radar (SAR) detection of spills
- Goal: Develop a portable radar system for up-close, detailed analysis of spills

(2 EE,  
2 CpE,  
2 ME?)





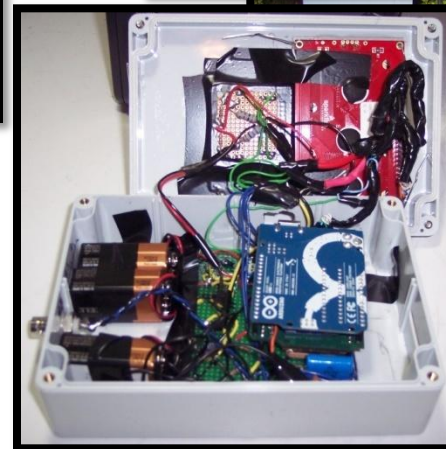
Project Advisors: Dr. Frank (ECE), John Mascaro (Turf-Tec)

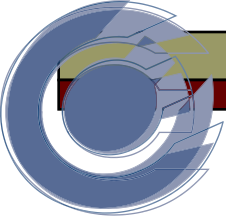
Project  
#7 (of 10)

# Turf Grass Test Equipment

(6 ECE)

- Sponsored by:  **Turf-Tec International**
  - Locally-based manufacturer & reseller
  - Ongoing project: this is Year 2
- Finish development of a turf-grass hardness impact tester
  - (with GPS datalogger)
  - Prototype designed last year → 
  - Design-for-manufacturing needed
- Also: Develop a new product:
  - Soil Moisture Meter
    - Time-domain reflectometry





Advisor: Dr. ?? (ME)

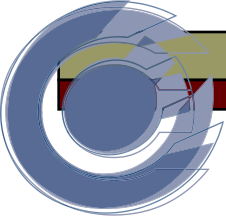
Project  
#8 (of 10)

# NASA Lunabotics Miner

2 ECE,  
? ME

- Lunar regolith mining robot competition
  - Details at:  
<http://ta.gd/lunabot>
- Kennedy Space Center
- Continuing project
  - Last year's team constructed a partially working excavator





Advisor: Dr. ?? (ME)

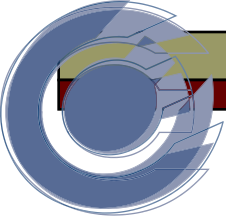
Project  
#9 (of 10)

# FIPSE-1/Drone (Brazil)

2 ECE,  
? ME

- Under U.S.-Brazil Student Exchange Program
  - Sustainable Energy & Aeronautical Engineering
    - <http://www.eng.fsu.edu/FIPSE-SEAEP/>
  - AUVSI 2012 Student UAS (Drone) Competition
    - <http://ta.gd/AUVSI-UAS12>
- Participating ECE students are already with the program in Brazil
  - Not available for additional students this year





Advisor: Dr. ?? (ME)

Project  
#10 (of 10)

# CanSat – Small Satellite

2 ECE,  
? ME

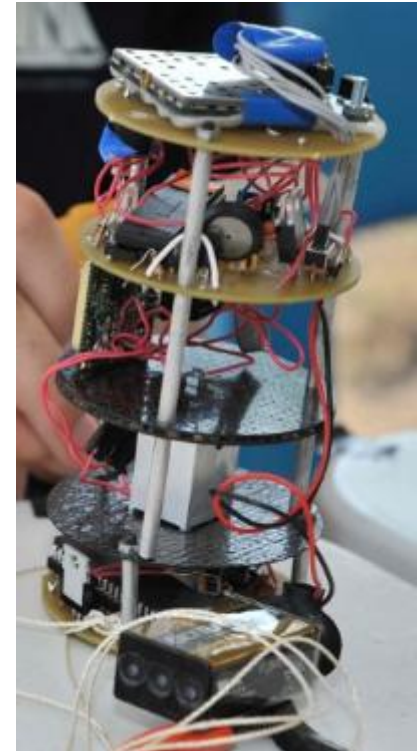
- Design/Build/Launch student competition

  - “Rockets will be provided”

- Launch from Texas in June



2012  
TEXAS



- See last year's webpage at

<http://www.cansatcompetition.com/Main.html>