Department of Electrical Engineering and Computer Science
Howard University

EECE401 Senior Design I
Electrical Engineering and Computer Engineering Student

Solution Design Presentation

Monday November 19, 2018
1:20 – 3:30pm
Room 3121 L. K. Downing Hall (Engineering building)
Howard University
Map address: 2300 6th St. NW Washington DC 20059

Instructor: Dr. Charles KIm

1:20 – 1:40pm
AutoMoe

Project Title		AutoMoe
Advisor		Dr. Danda Rawat
Graduate Assistant		
Team Members	Senior	Satchin Campbell, Samantha-Jo Cunnigham, Pawan Gaire, Savannah McCoy
	Others	Kuishon Brown, Mueizdeen Ajiborode
Project Goal	Long-Term	Implement smart system for autonomous real cars with secure real-time communication between devices
	2018-2019 academic year	Design and build two autonomous car prototypes capable of privacy aware inter-communication
Problem/Need Statement		Implementation of a secure smart-system for autonomous vehicle will reduce the number of accidents caused by drunk driving, distracted or reckless driving, speeding, and blind-spots which allow for more productive commute time and overall safety in transportation

1:40 – 2:00pm
eTrike

Project Title		eTrike
Advisor		Dr. Mamadou Wade
Graduate Assistant		
Team Members	Senior	India Burse, Ayana Walker, Tramia Johnson, Akinyemi Morakinyo
	Others	Terron Rose
Project Goal	Long-Term	Have a fully functioning ETRIKE that is cost effiecient, comfortable, and reliable.
	2018-2019 academic year	Make the E-TRIKE more space efficient, and include a feature to make it solar powered.
Problem/Need Statement		ETRIKE aims to create a standard, dependable, user friendly Comprehensive Solution that consolidates the productivity of a bicycle with the solace of a mechanized automobile, additionally including an Internet of Things framework to enhance comfort, lessen costs, and be more vitality cognizant. Not only for debilitated individuals who may have issues riding a bicycle, and young people who or looking for less expensive methods of transportation.

2:00 – 2:20pm

Graphone

Project Title		Graphone
Advisor		Dr. Hyung Bae
Graduate Assistant		
Team Members	Senior	Sheriff Adewumi, Harrell Tolentino, Rodney Edge
	Others	Ayush Giri, Fikunwa Kolawole, Jordan Fraser
Project Goal	Long-Term	To create a PCB that can measure the capacitance resolution of the graphone and create a platform for the graphone itself. The PCB must fit the customized model provided by the specs and must be able to connect to a computer which can use a software that does the actual calculation of voltage and capacitance
	2018-2019 academic year	We must research first the constructs of PCBs and come up with ideas to implement the graphone in a way to so it can be attached to the PCB without any problems.
Problem/Need Statement		Today's microphones are limited in their material designs. Graphone provides a robust design that can tolerate sound waves more than its standard microphone counterpart. Graphene bolstered by polymer provides a flexible component that provides more elasticity as a diaphragm. In addition, the graphone is generally much smaller but still provides the same sensitivity.

2:20 – 2:40 pm

Integrated Sensor Squad

Project Title		Sandia
Advisor		Dr. Grant Warner
Graduate Assistant		
Team Members	Senior	Nadine-Marie Bell, Michelle Chastang, Hakeem Thomas, Stephen Young
	Others	Jantelle Francis, Saka Paudel, Matthew Sheppard, Bibek Ramdam
Project Goal	Long-Term	Design an integrated sensor device using a microprocessor to sense environmental conditions without supplemental power and size constraints
	2018-2019 academic year	Design an integrated sensor device using a microprocessor to sense environmental conditions
Problem/Need Statement		The customer needs a small (possibly size specific) and efficient device which operates on low power and responds to its environment when necessary, that will sense and provide data on the different environments in which the customer deploys their systems and components

2:40 – 3:00pm

SLAM

Project Title		FGPA-Based SLAM (Solving Localization And Mapping problem between autonomous platforms)
Advisor		Dr. Michaela Amoo
Graduate Assistant		
Team Members	Senior	Cameron Lewis , Morganne Veal, Clifford Peeples, Jarrett Cunningham
	Others	Eric Cooper, Dorian Reid, David Hudson
Project Goal	Long-Term	Design an application-specific, Field Programmable Gate Array (FPGA)-based processor to tackle Simultaneous Localization and Mapping (SLAM)
	2018-2019 academic year	Design and build a COTS based autonomous wheeled platform with Bang Bang control, PID controller, and sensor arrays (IR Rangers, Scanless Lidars), using DSPACE and HIL (hardware in the loop). Final product must be capable of autonomous navigation and establish a baseline for FPGA-based implementation
Problem/Need Statement		Current Autonomous platforms are unable to handle the computational burden required for simultaneous localization and mapping (SLAM) in real time under any circumstances and in any environment. FPGAs offer a lower-power, low cost, robust solution. This project will design, build, and test an autonomous wheeled platform, comprising industry standard PID and Bang-Bang controllers, COTs sensors, processors and components, to establish baselines for evaluating the application specific FPGA-based SLAM processor(s).

3:00 – 3:20pm

Terminator

Project Title		Terminator
Advisor		Dr. Charles Kim
Graduate Assistant		
Team Members	Senior	Charles Robinson, Marcus Ragland, Owns Vil
	Others	T K Chibuike
Project Goal	Long-Term	Development of a chess playing robot
	2018-2019 academic year	Develop a robot which enables to recognize tic-tac-toe board and to play against human
Problem/Need Statement		We understand that people like to play board games, but most are two player games. A robot that plays tic-tac-toe fills a need that is void if there are no other humans present