

**Title** – Autonomous Cyber Physical Developmental System

**Program of Study** – Electrical and Computer Engineering

**Presentation Type** – PowerPoint

**Mentor(s) and Mentor Email** – Carl Pettiford (cpettiford@liberty.edu) and Michael Maiuzzo (mamaiuzzo@liberty.edu)

**Student name(s) and email(s)** – Andrew Davis (ardavis8@liberty.edu), Josiah Nagel (jnagel4@liberty.edu), Brandon Johnson (bjohnson182@liberty.edu) and Dustin Bowe (dlbowe2@liberty.edu)

**Category:** Experimental (Applied)

**Abstract:** The goal of Design Team 02 capstone project is to develop an Autonomous Cyber Physical Developmental System. A Cyber Physical system is one that contains a server that communicates to a computer where the computer can perform a physical function autonomously per direction of the server. Autonomy is a means for a computer to perform preset functions without human interaction. The means of achieving this goal is with a six legged robot. With three degrees of freedom per limb and the Intel Edison compute module as the brain, this project will bridge the gap between software and hardware. Once complete, it will serve as a means for future research and development in number of fields represented by Liberty's School of Engineering and Computational Science. The software aspect of the project will give future computer science majors a platform to integrate advance learning algorithms and see the effects represented in the physical world as well as configure the system for cyber physical defense and learn about cyber security. Computer Engineers will be able to create different sensors that can easily be added to the modular circuit design. Electrical engineers will be able to improve upon the power and communication efficiency thus extending the range and run-time of the system. As the nano technology is continually improved upon, the mechanical engineers will be able to advance the material and joint-interaction of the crawler making a stronger and faster machine. Design Team 02 will touch on most of these aspects with the intentions of creating a starting point for future development to occur.

**Christian worldview integration:** The model of the system is based on the belief that we cannot do anything apart from Christ who empowers us. Our system will have some onboard processing power but its true potential is brought out when it is connected to its base server. Although it will be able to process a limited amount of information, it was designed to be connected to the base. The late Dr. Falwell often stated that if it is Christian, it ought to be better. There are a limited number of Christians in the field of robotics. Armed with the desire to be champions for Christ, we want to ensure that Dr. Falwell's dreams did not only hold true for some areas of life, rather all of them. Design Team 02 is simply playing a small part in executing our mission.