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#### CECSTR NEWS

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TAMU SYSTEM PATHWAY SYMPOSIUM NOVEMBER 7 & 8, 2009

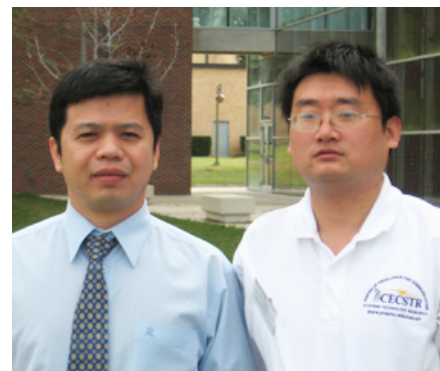
#### AWARD WINNING PROJECT - 1st PLACE (Graduate Division)

**Programmable Dead-time and Phase-shift Digital Controller by Using FPGA**

Research Assistants (G): Chu Kuang Liu, Chao Xia

Advisors: Dr. SuXia Cui, Dr. Yongpeng Zhang, and Dr. Cajetan M. Akujuobi

*Synopsis: This project describes an engineering project with simulation for a digital control module of the DC/DC Phase-shift Full Bridge Converter by using FPGA (Field Programmable Gate Array) in Xilinx environment with VHDL codes. The digital control module is developed to control the dead-time (Td) to achieve the ZVS (Zero Voltage Transition) in the Full-Bridge DC/DC converters and it is also able to shift the phase of the PWMs (PWMA, PWMB, PWMC, PWMD) with Tf to adjust the duty-cycle of the DC/DC converter by feedback to regulate the output voltage. This digital control module with FPGA technology will be used on the future research for the digital-control power architecture as to compare the performance with other digital controllers (DSP, Micro controller). (info>)*



Graduate RA: Chu Liu and Chao Xia



#### AWARD WINNING PROJECT - 2nd PLACE (UG- Division)

**Evaluation of Coefficient of Friction of Thermal Battery Insulators**

UG RA: Taiwo Femi-Fowode, Fiona Obasuyi, Babatunde Ekundayo, Seun Walker

Advisor: DR. Irvin Osborne Lee

*Synopsis: Thermal batteries are primary reserve batteries that are solid state at normal temperature. They have been the first choice of power supply for guided missiles and nuclear weapons. The aim of the work is to improve the knowledge base of material property data on thermal battery insulators. For this research the material property that was evaluated was the coefficient of friction, to determine the displacement of the battery component at high stress when the missile is in operation. The coefficient of friction is used to approximate the force of friction, which is determined by the ease with which two surfaces slide against each other. The angle at which an object begins to slide down an incline, when measured is used to determine the coefficient of friction,  $\mu$ . The frictional force is the force that resists the sliding motion of one surface over another. In this experiment the frictional force between the surface on the base material on the incline plane and the sample material was measured. (info>)*

UG RA: T. Femi-Fowode & F. Obasuyi

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