**Trenton Computer Festival Poster Information**

**Title:** Design and Verification of an Application Specific Integrated Circuit (ASIC)

**Abstract:**

The goal of this project is to gain experience in VLSI design by designing a chip that will process digital streaming audio data. More specifically, we will implement a 512-tap digital finite impulse response (FIR) filter, which will be applied to an input stream in order to create an output stream. We used the I2C protocol to allow a host to control the chip and the serial I2S protocol for transferring digital audio streams.

Our hardware design was represented using Verilog register-transfer level (RTL) code. To date, development has been done using Xilinx ISE Design Suite 14.7. Test benches were also designed and implemented using Verilog. The RTL design has been completed and tested. However, additional synthesis and verification still needs to be performed. The end goal of the project is to implement the design on a field-programmable gate array (FPGA) for testing.We will bring up our FPGA design with a realistic environment including an audio source, audio sink, and a microcontroller for reading and writing registers. We also hope to send a simple circuit for fabrication by MOSIS that will help us gain experience in physical chip design and prepare future groups to fabricate our full design.

**Biography:**

* Kevin Cao
  + Kevin is from Morris Plains, NJ and is a Computer Engineering major who is planning to enter the workforce after graduating at TCNJ. Kevin has interned as a software engineer at LGS Innovations, located in Florham Park, NJ.
* Whitley Forman
  + Whitley is from Ocean Grove, NJ and is an Electrical Engineering major who is continuing his education in the electrical field and will be obtaining his Master Electrician’s license after graduation. He is planning on using his new knowledge and experience with his current business to expand into new ventures.
* Dhruvit Naik
  + Dhruvit is from Mount Laurel, NJ and is a Computer Engineering major at TCNJ. He plans on entering the workforce after graduation and continuing his education in the coming years. He is the Vice-President of a startup, ThinkSOAS, INC.
* Zachary Nelson
  + Zachary is from Cream Ridge, NJ and is a Computer Engineering major who will be enrolling in a PhD program after graduation. He has experience as a software engineering intern at Teletronics Technology Corporation and an undergraduate student researcher at TCNJ as part of the MUSE program.
* Julie Swift
  + Juliann is from Robbinsville, NJ and is a Computer Engineering major who is planning on entering the workforce after college. She has experience as an AutoCAD Designer interning at Linearization Technology and a Software Development Life Cycle Analyst interning at Educational Testing Services. She participated in the undergraduate student research program, MUSE, at TCNJ.