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Eduardo Gonzalez

Education

2011 - 2013 **(Candidate) M.S in Software Engineering**, *Texas State University*, San Marcos, TX, *3.5/4.0*.

2007 - 2011 **B.S in Electrical Engineering**, *Texas State Unversity*, San Marcos, TX, *3.36/4.0*.
Specialized in Communication Systems and Networks

Master thesis

title *SCTP: An In-Depth Analysis of Retransmission Characteristics and the Effect of Network Conditions on Transfer Optimization.*

advisors Dr. Stan McClellan, Dr. Wuxu Peng, Dr. Mina Guirguis

description SCTP is a relatively new transport protocol originally designed to transfer SS7 signaling messages over packet switched networks but that has been standarized as a general transport protocol. This thesis focuses on its retransmission mechanisms and the peculiar effects that certain network conditions have on them providing insight into optimization opportunities.

Computer skills

basic Python, HTML, Java, Javascript, PHP, Linux Kernel, XML, CMake, Autotools

intermediate MATLAB/Simulink, C++, Labview, MultiSim, TCP/IP, Linux Development, Lab Testing Equipment, WireShark, Git

advanced Assembly(Motorola 68k), SCTP, C, Shell

Publications

[1] Eduardo Gonzalez and Stan McClellan, "A hybrid VOX system using emulated hardware behaviors," in *Proc. 7th Int'l Conf. on Digital Telecomm.*, Chamonix, France, May 2012.

Experience

Jan 2012 - Present **Research Assistant**, *Thesis*, Texas State University.
Spearheaded research on a relatively new transport protocol (SCTP).
- Performed a extensive literature review on current SCTP research.
- Designed and developed testing environment running on Linux that automated Kernel Module compilation, loading/unloading and logged relevant SCTP transfer parameters.
- Performed in-depth analysis of SCTP retransmission parameters including: Return Time Out, Round Trip Time and Return Time Out Minimum.
- Performed in-depth analysis of the effect of network parameters on SCTP performance including: Packet Loss, Packet Spacing and Packet Delay.
- Evaluated a proposed adaptive algorithm for managing the Return Time Out Minimum SCTP parameter.
- Discovered bug in SCTP Linux Kernel Module and submitted fix to developers mailing list.

Jul - Sep 2012 **GNURadio Module for Custom SDR Platform**, *Freelance Project*, Austin, TX.
Developed a GNURadio module to control, receive and display samples from a custom high bandwidth radio receiver.
- Created C Library that used TCP sockets to send and receive custom control structures from SDR hardware and used UDP sockets to receive raw IQ samples from SDR hardware in VITA49 format over 10GbE.
- Created Python wrappings for C library using SWIG.
- Created graphical block for GNURadio Companion using XML.

Aug - Dec 2011 **Vibration Sensor System**, *Freelance Project*, Austin, TX.
Created a small embedded system that used an accelerometer to measure large vibrations.

Jun - Aug 2011 **Speech Detector**, *Flex-Radio Systems*, Round Rock, TX.

Created non-computationally intensive speech detector for existing Software Designed Radio System based on Motorola's MICOM circuit [1].

- Received and analyzed schematic for an analog speech detection system developed in the 70s for HAM Radio operators.
- Modeled analog circuit using Multisim with a speech audio file as input.
- Created a digital model of the analog speech detector using Simulink.
- Conducted a literature review to find applicable approaches for speech detection in audio.
- Combined features from the analog circuit and digital approaches to create a robust speech detection system that maintained very low computation overhead.

Jan - Apr 2010/2011 **Autonomous Robot**, *IEEE Student Chapter*.

Designed and constructed small autonomous robots (from scratch) for the IEEE Region 5 Student Robotics Competion.

- Programmed entirely in assembly (68k) on Freescale 68HC12.
- Small mobile robots completed specific taks, including locating, analyzing and transporting objects while avoiding obstacles.
- Used a variety of sensors (IR, UltraSonic, Pressure) to complete tasks.

Feb - Mar 2011 **CPU Pipeline Simulator**, *Class Project*.

Implemented a MIPS interpreter with a simulation of CPU Pipeline execution including collisions in C.

Jan - Dec 2010 **Real-Time Powerline DAQ**, *Capstone Project*.

Modified existing LabView DAQ System and created new system in order to capture, save and display real-time waveforms using Agilent U2353A DAQ.

- Designed as Qued-State Machine.
- Used primarily to capture voltage and current information from live power-line feeds.
- Allos the implementation of post caputre processing on live streams using Matlab.

Aug - Dec 2010 **Teaching Assistant**, *"Circuits and Devices"*.

Helped manage class lab section.

Activities

2010 - 2011 **President**, *IEEE Student Branch*.

- Awarded Outstanding Small Student Branch in Region 5 during term.
- Represented the TxState IEEE Student Branch in all external affairs
- Hosted "Future City" Competition for middle school kids
- Founding member of Student Branch

2010 - 2011 **Vice-President**, *Water Polo Club*.

- Help manage Club's operations and reprentation within school system.