PAUL RIGGE

EDUCATION

Bachelor of Science   Expected graduation: December 2012
University of Michigan, Ann Arbor
Electrical Engineering and Computer Science (Dual Degree)

Relevant Coursework

Information Theory	Digital Communications and Coding
Digital Signal Processing Lab	Complexity Theory
Control Systems	Electronic Circuits
Data Structures and Algorithms	Advanced C++

EXPERIENCE

Summer Undergraduate Research in Engineering Intern   Summer 2012
Ann Arbor, MI
Researching polar codes, a new capacity achieving code with low complexity decoding. Investigating reasons why polar codes are currently unable to achieve similar performance as existing codes such as LDPC. Developing simulation-based methods for constructing better polar codes that are more competetive with existing codes. Working on a hardware emulation platform on FPGA for further investigation. Research conducted under Professor Zhengya Zhang and continuing into the fall term.

Instructional Aide   Winter 2012
Ann Arbor, MI
Instructional Aide for EECS 487, Interactive Computer Graphics. Developed problem sets and exams, graded exams, and taught a weekly discussion section.

Blue Waters Petascale Education Program Intern   May 2011 - August 2012
Ann Arbor, MI
Conducted research using computational and numerical methods for solving nonlinear partial differential equations. Used MATLAB, Python, C, and FORTRAN to implement high performance solvers. Research conducted under Benson Muite of the University of Michigan Mathematics Department.

Qualcomm Intern   Summer 2010
San Diego, CA
Member of Qualcomm's Chrome OS Boot Drivers team. Developed firmware auto-update feature and proposed modifications to Qualcomm's Secure Boot Architecture to meet Google security requirements. Worked with team members in Boulder, CO; Raleigh, NC; San Diego, CA; and India.

Papers

P. Rigge. "Numerical Solutions to the Sine-Gordon Equation" (submitted).

Presentations

B. Cloutier, B.K. Muite, and P. Rigge. "A comparison of CPU and GPU performance for Fourier pseudospectral simulations of the Navier-Stokes, Cubic Nonlinear Schrodinger and Sine Gordon equations", SAAHPC 2012, Argonne, 2012.

P. Rigge and B.K. Muite. "An Examination of Precision Effects on Numerical Solutions of Partial Differential Equations", IIT SIAM 2011, Chicago, 2011.

B. Cloutier, P. Rigge, J. Whitehead, B.K. Muite, H. Johnston. "Numerical Investigations of Convection", TeraGrid 2011, Salt Lake City, 2011. *Received best undergraduate poster award.*

Projects

For a more complete list as well as videos, posters, and other resources, please see my website.

WeSketch iOS App   Fall 2012

Building a collaborative paint and animation app for iOS as part of a computer science senior design project. The App will be part of the Intergalactic Mobile Learning Center's WeCollaborate Learning Platform for use in K-12 educational settings.

Real-time Audio Steganography System   Winter 2012

Built a communications system for an electrical engineering senior design project. A DSP hides digital information in a spread spectrum signal that is added to an audio signal from an MP3 player. The spread spectrum signal is inaudible to a listener, but the decoder can extract and display the information reliably. My responsibilities included high-level system design, building a software prototype, implementing the encoder, clock recovery, channel coding, writing SPI drivers to support FPGA to DSP communication, and programming an FPGA to capture keyboard input.

Honors and Awards

EECS Outstanding Achievement Award (2012)
College of Engineering Distinguished Academic Achievement Award (2012)
James B. Angell Scholar
William Harvey Seeley Prize (2011)
William J. Branstrom Freshman Prize (2010)
Shipman Scholar
Dean's List (2009-2012)

Computer Skills

Languages: C/C++, Python, FORTRAN, Java, MATLAB, Bash script
Operating Systems: Linux, Mac OS X, Android
Software: Git, Subversion, OpenGL, FFTW, MPI, LAPACK, BLAS, VisIt