Steven Charles Thompson

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Education

PhD, Electrical Engineering, University of California at San Diego, 2005

MSc, Electrical Engineering, University of California at San Diego, 2001

BSc, Electrical Engineering, Arizona State University, 1999

Work Experience

Argon ST, SDRC (Network Systems), San Diego, CA, 2006–present

Engineer—Communication Systems
Member of the Advanced Communications Research group. Algorithm development, simulation, and analysis of digital communications systems. Particular focus: orthogonal frequency-division multiplexing (OFDM), equalization and multiple-input multiple-output (MIMO) techniques, power amplifier linearization, and spatial processing. Funding agencies include the Defense Advanced Research Projects Agency (DARPA) and the Office of Naval Research (ONR).

California Institute for Telecommunications and Information Technology (Calit2), UCSD Division, 2005–2006

Postdoctoral Scholar
Primary researcher for ONR 6.2 project "Advanced Robust Modulation (ARM), Phase II" in collaboration with Nova Engineering. The goal of this ongoing project is to upgrade an existing small-form-factor software defined radio (SDR), running the OFDM Wideband Networking Waveform (WNW) component of the Joint Tactical Radio System (JTRS), to support an additional constant envelope OFDM (CE-OFDM) mode.

University of California at San Diego, 2001–2005

Graduate Student Researcher
Dissertation: "Constant Envelope OFDM Phase Modulation," 2005

Research, funded by the Center for Wireless Communications, focused on the peak-to-average power ratio (PAPR) problem associated with OFDM systems. Developed a solution, constant envelope OFDM, that transforms the OFDM signal prior to amplification and inverse transforms the signal at the receiver. Designed and analyzed CE-OFDM transmitter and receiver. Developed theoretical foundation for the format including signal space properties, performance of optimum receiver, signal spectrum properties, and techniques to combat effects of wireless channels.

Active participant in Phase I of the ARM project, that was also funded by ONR as a 6.1 effort.

Space and Naval Warfare Systems Center San Diego, Summer 2004

Intern
Worked with naval engineers on the theoretical aspects of CE-OFDM. Helped develop simulation software to validate analytical results. Worked on modeling power amplifiers and wireless channels.

University of California at San Diego, Winter 2002

Teaching Assistant
Assisted Prof. Jack Wolf with the teaching and grading for the digital communications course ECE 154B, "Communications Systems II."

Space and Naval Warfare Systems Center San Diego, Summer 2001

Intern
Studied OFDM systems and the PAPR problem. In the lab, became familiar with JTRS prototype.

Los Alamos National Laboratory, Los Alamos, NM, Summer 1998

Intern
Worked with Physics-23 group at the Los Alamos Neutron Science Center (LANSE). Helped build electrical circuits used for linear particle accelerator experiments.

Inter-Tel, Chandler, AZ, 1997–1998

Associate Engineer
Worked on the development of a digital phone system emulator. Designed a field programmable gate array (FPGA) that interfaced many asynchronous phone connections to a personal computer.

Awards and Honors

- Powell Fellowship, University of California at San Diego, 1999–2001
- Golden Key National Honor Society, 1996–1999
- Dean's List, Arizona State University, 1995–1999

Professional Membership

- Institute of Electrical and Electronics Engineers

Proficiencies

Skilled at using ∗nix (GNU/Linux, BSD Unix, etc.) computer systems; the LaTeX document preparation system; various graphics tools including Gnuplot, Xfig, and the GIMP; programming languages including Matlab/Octave, C/C++, Perl, Python, Bash and HTML; and the Vim text editor. Experienced with the administration of clustered ∗nix workstations, web servers and mail servers; and experienced with other commonly-used computer operating systems and related software.

Volunteer and Service Activities

- Webmaster and system administrator for Prof. Zeidler's website, http://zeidler.ucsd.edu, 2001–2006; and for the ECE Graduate Student Council's website, http://ecegsc.ucsd.edu, 2002–2003
- President, ECE Graduate Student Council, 2002–2003
- Technical reviewer (ongoing)
  - Journals: *IEEE Journal on Selected Areas in Communications*; *IEEE Transactions on Communications*; *IEEE Transactions on Wireless Communications*
  - Conferences: *Proc. IEEE Vehicular Technology Conference*; *Proc. IEEE Innovations in Information Technology*
  - Book: *The Handbook of Computer Networks*, ed. H. Bidgoli (to be published by John Wiley & Sons)

Publications

Journal Papers

J$_1$: S. C. Thompson, A. U. Ahmed, J. G. Proakis, J. R. Zeidler, and M. Geile, "Constant Envelope OFDM," (to appear in *IEEE Transactions on Communications*).

Conference Papers

C$_6$: A. U. Ahmed, S. C. Thompson, and J. R. Zeidler, "Constant Envelope OFDM (CE-OFDM) with Channel Coding," in *Proc. of the Military Communication Conference*, in press.

C$_5$: S. C. Thompson, J. G. Proakis, J. R. Zeidler, and M. Geile, "Constant Envelope OFDM in Multipath Rayleigh Fading Channels," in *Proc. of the Military Communication Conference*, in press.

C$_4$: S. C. Thompson, J. G. Proakis, and J. R. Zeidler, "The Effectiveness of Signal Clipping for PAPR and Total Degradation Reduction in OFDM Systems," in *Proc. of the IEEE Global Telecommunications Conference*, vol. 5, St. Louis, Dec. 2005, pp. 2807–2811.

C$_3$: S. C. Thompson, J. G. Proakis, and J. R. Zeidler, "Noncoherent Reception of Constant Envelope OFDM in Flat Fading Channels," in *Proc. of the IEEE International Symposium on Personal Indoor and Mobile Radio Communications*, vol. 1, Berlin, Sep. 2005, pp. 517–521.

C$_2$: S. C. Thompson, A. U. Ahmed, J. G. Proakis, and J. R. Zeidler, "Constant Envelope OFDM Phase Modulation: Spectral Containment, Signal Space Properties and Performance," in *Proc. of the Military Communication Conference*, vol. 2, Monterey, Nov. 2004, pp. 1129–1135.

C$_1$: S. C. Thompson, J. G. Proakis, and J. R. Zeidler, "Constant Envelope Binary OFDM Phase Modulation," in *Proc. of the Military Communication Conference*, vol. 1, Boston, Oct. 2003, pp. 621–626.