

Stephen James Longfield, Jr.

Computer Systems Lab
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- RESEARCH INTERESTS** Asynchronous VLSI, Low-energy circuitry, Formal design methods, Circuit analysis, Systems design, Systems verification, Programming languages
- OBJECTIVE** Contribute to deep research and development projects in computer engineering and design, with a focus on formal verification of complex systems. Longer term, build the leadership and project management skills needed to run a lab.
- EDUCATION**
- Cornell University.** *Doctor of Philosophy* (In Progress) **Dec.14** (Anticipated)
Cornell University. *Master of Science* **Mar.13**
Ithaca, NY
- Major: Electrical and Computer Engineering
 - Minor: Computer Science
 - Speciality: Asynchronous VLSI design and analysis
 - Adviser: Prof. Rajit Manohar
 - GPA: 3.68
- F. W. Olin College of Engineering.** *Bachelor of Science* **May.09**
Needham, MA
- Major: Electrical and Computer Engineering
 - Adviser: Prof. Mark Chang
 - Final GPA: 3.61
- SKILLS**
- Programming Languages:** CHP, Python, OCaml, Verilog, C, C++, Java, Matlab
Tools: ACT, SPICE, SPIN, LaTeX, Micromagic Max, Cadence Encounter
Techniques: Circuit design, Model checking, Algorithms, Transistor layout
- GRADUATE RESEARCH**
- Computer Systems Laboratory at Cornell University**
- Research Assistant* **Jul.09-present**
- Adviser: Prof. Rajit Manohar
 - *Probabilistic Analysis for QDI Circuitry.* Extending existing QDI analysis techniques to include probabilistic information and enable average-case performance estimation.
 - *Type system for Communicating Hardware Processes.* Designed and implemented a type system for the Communicating Hardware Processes language the AVLSI lab uses to design asynchronous circuits.
 - *Reverse Engineering Asynchronous Circuits.* Designed and implemented a tool for automated reverse engineering of QDI asynchronous circuits and specifications. Presently making the analysis more general and investigating its applications for verification.
 - *Low-power GPS Receiver.* Designed, implemented, and had manufactured in 90nm CMOS a low-power GPS Receiver. This project was done in conjunction with other GPS and circuit researchers at Cornell University, my contributions were principally in the VLSI design and implementation. Testing demonstrated over 90% reduction in power consumption relative to commercial offerings.
- UNDERGRADUATE EXPERIENCE**
- F.W. Olin College of Engineering**
- Senior Capstone* **Sep.08-May.09**
- Program sponsor: Raytheon
 - Investigated and reported on the effects of terrain and weather patterns on X-band communications

	<i>Undergraduate Teaching Assistant</i>	Sep.06-May.09
	<ul style="list-style-type: none">• Classes taught by Prof. G. Pratt, Prof. B. Storey• Undergraduate introduction to engineering concepts (ModCon: Engineering of Compartment Systems, ModCon: Engineering of Distributed Systems)	
	<i>Undergraduate Research : Embedded Systems Laboratory</i>	Sep.07-May.09
	<ul style="list-style-type: none">• Program adviser: Prof. M.L. Chang• FPGA Stereo vision research	
	<i>Undergraduate Research: Olin Intelligent Vehicles Laboratory</i>	Sep.06-May.07
	<ul style="list-style-type: none">• Program adviser: Prof. D. Barrett• MATLAB controller for autonomous tractor• LabView controller for small surface craft	
PROFESSIONAL EXPERIENCE	Reviewer ASYNC, 2013, 2014	
	Circuit Design Intern DEKA Research	May.08-Aug.08
	<ul style="list-style-type: none">• Circuit design, PCB Layout, and ARM embedded programming	
	Circuit Design Intern iRobot, Industrial and Military Research	May.07-Aug.07
	<ul style="list-style-type: none">• Circuit design, mechanical CAD, and PIC embedded programming	
	Intern and Lab Assistant Schlumberger Doll Research	Feb.05-Aug.05
	<ul style="list-style-type: none">• Titration and Spectrophotometry technician	
PUBLICATIONS	Removing Concurrency for Rapid Functional Verification <i>Longfield, S.; Manohar, R.</i> <i>International Conference on Computer Aided Design</i> , 2014.	
	Inverting Martin Synthesis for Verification <i>Longfield, S.; Manohar, R.</i> <i>International Symposium on Asynchronous Circuits and Systems</i> , 2013. (Best paper award)	
	Low Power ASIC GPS Tracking Loops: Quantifying the Trade-Offs Between Area, Power and Accuracy Tang, B. Z.; <i>Longfield, S.</i> ; Bhave, S; Manohar, R. <i>ION GNSS 2012</i> , 2012. (Best presentation award for session E1: Receivers & Antennas 1)	
	A Low Power Asynchronous GPS Baseband Processor Tang, B. Z.; <i>Longfield, S.</i> ; Bhave, S; Manohar, R. <i>International Symposium on Asynchronous Circuits and Systems</i> , 2012.	
	A Parameterized Stereo Vision Core for FPGAs <i>Longfield, S.</i> ; Chang, M.L. <i>Field Programmable Custom Computing Machines</i> , 2009.	
	Unmanned Surface Vehicles for Undergraduate Engineering Education Holler, J.; <i>Longfield, S.</i> ; Murphy, K; Stritz, A.; Bingham, B. <i>OCEANS</i> 2008.	
PATENTS	Low Power Asynchronous GPS Baseband Processor Manohar, R.; Tang, B.; <i>Longfield, S.</i> ; Bhave, S. Filing Date: 25 February 2013; Publication No. WO2013126875	
AWARDS	NSF Graduate Research Fellowship	Sep.10-Sep.13
	Cornell University, Jacobs Fellowship	Aug.09-Sep.10
	F.W. Olin Four-Year Full-Tuition Scholarship	Aug.05-May.09
	Boy Scouts of America: Eagle Scout	Oct.05