Ryan R. Newton

Resumé

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Interests

Compilers, programming lang., sensor networks, embedded software, parallelization.

Publications & Presentations

Wishbone: Profile-based Partitioning for Sensornet Applications, Ryan Newton, Sivan Toledo, Lewis Girod, Hari Balakrishnan, Samuel Madden, To appear in ACM SIGCOMM *Networked Systems Design and Implementation (NSDI '09)*, Boston, Massachusetts, April 2009.

Functional in the field, *Presented at ICFP DEFUN*, Victoria, B.C., September 2008.

Design and Evaluation of a Compiler for Embedded Stream Programs, Ryan Newton, Lewis Girod, Michael Craig, Greg Morrisett, Samuel Madden, In ACM SIGPLAN *Languages, Compilers, and Tools for Embedded Systems* (LCTES '08), Tucson, Arizona, June 2008.

The Pothole Patrol: Using a Mobile Sensor Network for Road Surface Monitoring, Jakob Eriksson, Lewis Girod, Bret Hull, Ryan Newton, Samuel Madden, Hari Balakrishnan, In ACM SIGMOBILE *Mobisys 2008*, Breckenridge, Colorado, June 2008.

VoxNet: An Interactive, Rapidly-Deployable Acoustic Monitoring Platform, Mike Allen, Lewis Girod, Ryan Newton, Daniel T. Blumstein, Deborah Estrin, In ACM/IEEE *International Conference on Information Processing in Sensor Networks*, SPOTS track (IPSN/SPOTS '08), St. Louis, Missouri, April 2008.

XStream: A Signal-Oriented Data Stream Management System, Lewis Girod, Yuan Mei, Ryan Newton, Stanislav Rost, Arvind Thiagarajan, Hari Balakrishnan, Samuel Madden, In IEEE *International Conference on Data Engineering* (ICDE'08), Cancun, Mexico, April 2008.

The Regiment Macroprogramming System, Ryan Newton, Greg Morrisett, Matt Welsh, In ACM/IEEE *International Conference on Information Processing in Sensor Networks* (IPSN'07), Cambridge, MA, April 2007.

The Case for a Signal-Oriented Data Stream Management System, Lewis Girod, Yuan Mei, Ryan Newton, Stanislav Rost, Arvind Thiagarajan, Hari Balakrishnan, Samuel Madden, In ACM SIGMOD *Conference on Innovative Data Systems Research* (CIDR'07), Pacific Grove, CA, January 2007.

WaveScript: Language Support for Distributed Stream Processing, *Presented at Northeastern University PL Seminar*, November 2007.

Functional Programming in the Wild, *Presented at NEPLS*, October 2007.

Compiling Functional Reactive Macroprograms, Ryan Newton, *Masters Thesis*, 2005.

Building up to Macroprogramming: An Intermediate Language for Sensor Networks, Ryan Newton, Arvind, Matt Welsh, In ACM/IEEE *International Conference on Information Processing in Sensor Networks* (IPSN'05), Los Angeles, CA, April 2005.

Region Streams: Functional Macroprogramming for Sensor Networks, Ryan Newton, Matt Welsh, In *International Workshop on Data Management for Sensor Networks* (DMSN'04), Toronto, Canada, August 2004. (>100 citations).

Amorphous Language Implementation, Ryan Newton, Jake Beal, *CSAIL Technical Report MIT-CSAIL-TR-2006-015*, 2002.

Education

Jan 2009	**Ph.D., EECS**, *Massachusetts Institute of Technology*, Cambridge.
	Minor in computational biology. Thesis: "Language Design for Distributed Stream Processing"
2005	**S.M., EECS**, *Massachusetts Institute of Technology*, Cambridge.
2002	**B.S., Computer Science**, *Indiana University*, Bloomington.
	3.89/4.0 GPA, 3.97 in major.
1991–1999	**CS, Math**, *MEGSSS/IMACS Program*, Plantation, FL.
	7 year math and computer science program, beginning in the 6th grade.

Work Experience

Jun-Sep 2008	**Intern**, *Nokia Research*, Cambridge, MA.
	Worked on prototype phone platform and parallelizing computer vision application across phone and PC using WaveScript.
Jun-Sep 2005	**Intern**, *Microsoft Research*, Redmond, WA.
	Framework for automatic composition of sensor network services based on logic programming.
2001	**Assistant Editor**, *Indiana University*, Bloomington, IN.
	Employed by Dr. Daniel P. Friedman to assign exercise difficulties for the second edition of the *Essentials of Programming Languages* textbook.
2000-2002	**Undergraduate Research Assistant**.

- With Dr. Douglas Hofstadter: Developed a cognitive model of pattern perception in a number-sequence microdomain.
- With Dr. Kent Dybvig: Developed a Scheme compiler for the Microsoft .NET platform.
- With Dr. Amr Sabry: Translation of the work in Fillinsky's 1994 "Representing Monads" into the purely functional context (Haskell).

Summer 1999, 2000	**Staff programmer**, *Schemer's Inc*, Plantation, FL.
	Development work on EdScheme IDE.

Teaching Experience

Spring 2009	**Recitation Instructor**: MIT's Computer Systems Engineering (6.033).
2004-2008	**Resident Tutor, Harvard**: Individual tutoring & general advising.
Fall 2003	**Teaching assistant, MIT**: Multithreaded Parallelism: Languages and Compilers (6.827).
2000,2001	**Teaching Assistant, Indiana U.**: intro programming, undergrad & grad prog. languages.
1998-1999, 2000	**Instructor**: IMACS

Awards, Activities, and Skills

Awards	Indiana University Faculty Scholarship, Exxon Scholarship. NSF and NDSEG graduate fellowships.
Organizer	Student reading group on radical programming models and proposals (2004).
Reviewer	For conferences/journals, including EWSN, IPSN, Sensys, PLDI, TOSN.
Research Supervisor	Supervised two Master's students contributing to WaveScope project
Programming Languages	C/C++, Java, Scheme, OCaml/SML, Haskell
Operating Systems	Linux, Windows, Mac OS, various embedded (e.g. TinyOS)