Jacob B. Schroder

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Education

- **University of Illinois at Urbana-Champaign** — Urbana, IL
  Ph.D. Candidate in the Department of Computer Science — *2004 – Present*
  Advisor: Prof. Luke Olson in the Scientific Computing Group
  Dissertation title: Generalizing Smoothed Aggregation

- **Technische Universität München** — Munich, Germany
  One Year of Study as Programmstudent — *2003 – 2004*
  Supported by Rotary International Scholarship

- **Furman University** — Greenville, SC
  B.S. in Computer Science and Computer Science – Mathematics — *1999 – 2003*
  Phi Beta Kappa, summa cum laude,
  Computer Science Department's "Distinguished Senior Award",
  President of Upsilon Pi Epsilon, a computer science honor society

Publications

Note: Preprints for all publications can be found at:

`http://www.cse.illinois.edu/~jschrod3/research.html#publications`

[4] L. N. Olson, J. B. Schroder. *Smoothed Aggregation for Helmholtz Problems.* Numerical Linear Algebra with Applications. 2009. To appear.

[3] L. N. Olson, J. B. Schroder, R. S. Tuminaro. *A New Perspective on Strength Measures in Algebraic Multigrid.* Numerical Linear Algebra with Applications. 2009. To appear.

[2] J. Schroder, R. Tuminaro, L. Olson. *Generalized Strength of Connection in Algebraic Multigrid.* CSRI Summer Proceedings 2007. pp. 12-26. 2007.

[1] V. Howle, J. Schroder, R. Tuminaro. *The Effect of Boundary Conditions within Pressure-Convection Diffusion Preconditioners.* Sandia National Labs Technical Report #2006–4466. July, 2006.

Presentations

[2] *Smoothed Aggregation Multigrid for Helmholtz Problems.* Fourteenth Copper Mountain Conference on Multigrid Methods, Copper Mountain, Colorado. March 23, 2009.

[1] *A General Strength-of-Connection Concept in AMG.* Tenth Copper Mountain Conference on Iterative Methods, Copper Mountain, Colorado. April 7, 2008.

Experience

- **University of Illinois at Urbana-Champaign** — Urbana, IL
  Lead Teaching Assistant — *Fall 2009*
  Shared lecturing and exam writing responsibilities with instructor for undergraduate "Introduction to Numerical Analysis" course

- **University of Illinois at Urbana-Champaign** — Urbana, IL
  Research Assistant — *2006 – 2009*
  Worked with advisor, Prof. Olson, on multilevel solvers for electromagnetics problems, NSF award DMS-0612448

- **Sandia National Labs** — Livermore, CA
  Intern — *Summer 2007*
  Continued work with Dr. Tuminaro on strength-of-connection measures in algebraic multigrid

- **Sandia National Labs** — Livermore, CA
  Intern — *Summer 2006*
  Worked with Dr. Tuminaro on strength-of-connection measures in algebraic multigrid

- **Sandia National Labs** — Livermore, CA
  Intern — *Summer 2005*
  Worked with Dr. Tuminaro and Dr. Howle on pressure-convection diffusion preconditioners for incompressible Navier-Stokes problems

- **University of Illinois at Urbana-Champaign** — Urbana, IL
  Teaching Assistant — *2004 – 2006*
  Undergraduate and graduate level "Introduction to Numerical Analysis" courses

- **Furman University** — Greenville, SC
  Undergraduate Research Fellow — *2002*
  Parallelized an atmospheric modeling tool that supported the NASA-TIMED satellite mission

Programming

- **Languages**
  C, Python, Matlab

- **Projects**
  ML, PyAMG
  Contributed to a development version of ML, a parallel multilevel solver package developed by Sandia National Labs

  One of three main developers for PyAMG, an open source Python implementation of both classic algebraic multigrid and smoothed aggregation style multigrid, www.pyamg.org, 1,000+ downloads

Languages

- **German**
  20/20 Points on the TestDaF in 2004 (analogous to the TOEFL)

Primary References

- Prof. Luke Olson
  Department of Computer Science
  University of Illinois at Urbana-Champaign
  4312 Siebel Center, MC 258
  201 N Goodwin Ave
  Urbana, IL 61801
  `lukeo-at-illinois.edu`
- Dr. Raymond Tuminaro
  Computation, Computers and Mathematics
  MS 9214
  Sandia National Laboratories
  Livermore, CA 94551
  `rstumin-at-sandia.gov`
- Prof. Michael Heath
  Department of Computer Science
  University of Illinois at Urbana-Champaign
  4324 Siebel Center, MC 258
  201 N Goodwin Ave
  Urbana, IL 61801
  `heath-at-illinois.edu`
- Additional references available upon request