

Brian S. Eastwood

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Education

University of North Carolina, Chapel Hill, NC. Doctor of Philosophy student, 2003 – present.
Advisor: Dr. Russell M. Taylor II

University of Vermont, Burlington, VT. Bachelor of Science, Magna Cum Laude, 1999.
Major: Physics; Minors: Computer Science, Applied Mathematics; GPA: 3.75

Research Interests

Image analysis and computer vision: motion tracking, layer analysis, feature detection, scale-space analysis, image enhancement.

Computer-integrated microscopy and nanoscale science: microscopy image analysis, human-microscope interfaces, interdisciplinary collaboration.

Research Experience

Research Assistant, University of North Carolina, Department of Computer Science.

Nanoscale Science Research Group, September 2003 – present.

Developed ImageTracker, motion analysis software for microscopy videos, in collaboration with Dr. Russell M. Taylor II. ImageTracker targets analysis of mucus fields driven by beating cilia and microtubule dynamics during cellular mitosis, but is applicable to general problems in motion detection. Features include multiresolution image stabilization, multiresolution optical flow, and background removal.

Visiting Student Researcher, National Taiwan University, Taipei, Taiwan.

Mechanical Engineering Department, September – November 2005.

Developed software for controlling a micro electromechanical system (MEMS) for microscopy stage positioning. The application controlled a six degree-of-freedom platform using intuitive input devices, including the Magellan and Phantom.

Software Engineer, University of North Carolina, Department of Biology.

Collaboration with Dr. Kenneth Lohmann and graduate students, May – June 2005.

Designed and developed MockTurtle, software that controls experiments in sea turtle navigation. MockTurtle enables researchers to design and execute experiments in which sea turtles respond to a simulation of the Earth's magnetic field. The software integrates hardware control (including power supplies that drive a set of magnetic coils), data acquisition (including collecting data from encoders that measure sea turtle heading), and experiment timing.

Intern Programmer, IBM Microelectronics Division, UVM Co-op, Burlington, VT.

June 1997 – September 1998.

Designed and developed a microprocessor manufacturing control application. Served as an active team member in implementing the first large-scale Java application at IBM Burlington. Wrote client, server, and data access components for a network-distributed application that managed manufacturing instructions.

Independent Research Project, University of Vermont, Department of Physics.
Under Dr. Junru Wu, Fall 1998 – Spring 1999.
Developed an optics system for hologram production.

Teaching Experience

Courses Taught

Instructor, University of North Carolina, Department of Computer Science.

Introduction to Scientific Programming, Spring 2008.

Developed a one-semester introduction to programming for non-computer science majors using MATLAB. The course introduces basics of programming (variables, data types, flow of control, modular design) that are common to many languages. Designed lectures, in-class exercises, programming assignments, quizzes, and exams. Implemented a peer code review system for students to evaluate and improve their programming and writing skills.

Guest Lecturer, University of North Carolina, Department of Computer Science.

Introduction to Scientific Programming, 2 lectures, Summer 2008.

Teaching Assistant, University of Vermont, Department of Physics.

Introductory Lab for Elementary Physics, Fall 1998 – Spring 1999.

Prepared and gave brief lectures and demonstrations weekly. Held weekly office hours to advise students and provide extra help with problem solving. Evaluated and graded student lab reports.

Courses and Seminars Taken

Peer-led Team Learning in Computer Science Workshop, Duke University, April 2007

Technical Communication in Computer Science, University of North Carolina, Spring 2007

Teaching and Course Development, University of North Carolina, Fall 2006

Publications

Eastwood, B. and Taylor, R.M. Occlusion removal in video microscopy. *Computer Analysis of Images and Patterns*, 2007, 4673, 125 – 132.

O'Brien, E.T., Falvo, M.R., Millard, D., **Eastwood, B.**, Taylor, R.M., and Superfine, R. Monomolecular fibrin sheets: A possible kinetic intermediate in fiber assembly. *Proceedings of the National Academy of Sciences USA*, (in review).

Fuxjager, M.J., **Eastwood, B.**, Davidoff, K.R.B., and Lohmann, K.J. Geomagnetic navigation in loggerhead sea turtles: responses to regional magnetic fields along a transoceanic migratory pathway. (In preparation.)

Scientific Presentations

Oral Presentations

Eastwood, B. ImageTracker: microscopy image analysis demonstrations. Light Microscopy for Biomedical Research Workshop, University of North Carolina, September 2008.

Eastwood, B. ImageTracker: software for microscopy image analysis. Lasers and Microscopy User Conference, University of North Carolina, June 2008.

Taylor, R.M., **Eastwood, B.**, Quammen, C., Feng, D., and Marshburn, D. Computer Integrated Systems for Microscopy and Manipulation (CISMM) Software Workshop. Force Measurement and Manipulation in Biological Microscopy, University of North Carolina, May 2007 and May 2008.

Poster Presentations

Eastwood, B. and Taylor, R.M. Occlusion removal in video microscopy. Computer Analysis of Images and Patterns Conference, Vienna, Austria, 2007.

Employment

Software Engineering Consultant, Accenture, Wellesley, MA, August 1999 – July 2003.

Worked on diverse projects including:

Fidelity Investments, June 2002 – July 2003.

Designed and implemented a transparent object-oriented data access architecture for a high-volume securities trading application.

GE Capital, November 2001 – April 2002.

Designed and implemented software components for a corporate deal management system.

JPMorganChase, June 2000 – October 2001.

Designed and implemented components of a large trade management application, including application control, business logic, application architecture, and data access. Helped establish Accenture's India Solution Center, including consultant training.

Shoplinc.com, September 1999 – June 2000.

Managed and automated application build and deployment processes for a home-delivery internet grocery store. Managed development, staging, testing, and production application environments.

Computer Clerk, IDX Corporation, Burlington, VT, May 1997 – September 1997.

Executed and monitored computer backups, wrote an automated backup monitoring application.

Honors and Awards

Phi Beta Kappa, 1999.

Albert D. Crowell Award, University of Vermont, 1999.

For outstanding research in physics as an undergraduate.

Mortar Board National Honor Society, 1998 – 1999.

An academic and community service oriented society. Served as web master and member of selections committee

UVM Boulder Society, University of Vermont, 1998 – 1999.

An honor society for senior males. Served as web master.

Vermont Scholar, University of Vermont, 1995 – 1999.

A full-tuition scholarship awarded to Vermont students on the basis of academic achievement.

Golden Key National Honor Society, 1996 – 1999.

Phi Eta Sigma Honor Society, 1996.

Outreach

Outreach Volunteer, Women and Math demonstrations. University of North Carolina, 2004 – 2008.
Demonstrated nanoManipulator, a computer interface to the atomic force microscope, to female high school students.

Exhibit Coordinator and Exhibitor, Center for Computer Integrated Systems for Microscopy and Manipulation (CISMM) Exhibit, American Society for Cell Biology Annual Meeting. Washington, DC, December 2007.

Presenter, “Image Analysis for Video Microscopy”, CISMM grant review board meeting, funded by the NIH/National Institute of Biomedical Imaging and Bioengineering. University of North Carolina, October 2007.

Exhibitor, CISMM Exhibit, Biophysical Society Annual Meeting. Baltimore, MD, March 2007.

Service

Coordinator, nano-cs weekly meeting, Department of Computer Science, UNC-CH, Summer 2008.

Faculty Search Committee, Department of Computer Science, UNC-CH, 2006 – 2007.

Sitterson South Committee, building extension planning, Department of Computer Science, UNC-CH, November 2004 – April 2005.

Skills

Computer Languages: Proficient in C/C++, MATLAB, Java, C#. Experienced in Python, PHP, JavaScript, HTML.

Software Libraries: Insight Toolkit (ITK), Visualization Toolkit (VTK), wxWidgets.

Photography: Digital and film SLR, digital image processing, and black and white development and printing.

French: Intermediate conversation and reading competence, 5 years experience.

Zymurgy.

Bread baking.