Naomi Fox

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Education

B.A., Computer Science. Smith College, Northampton, MA, 2002.

B.E., Engineering Thayer School of Engineering, Dartmouth College, Hanover, NH, 2003.

M.S., Computer Science University of Massachusetts, Amherst, MA, 2008.

Ph.D. Candidate, Computer Science, University of Massachusetts, Amherst, MA, Expected, 2012.

Research

My research is in computational biology and applications of rigidity theory. I build software tools for modeling proteins as mechanical structures and analyzing their flexibility using efficient combinatorial algorithms. My goal is to further our understanding of protein behavior by improving techniques for rigidity analysis.

Skills

I have programmed extensively in C++, the language in which the KINARI software suite is written. Over the time I have spent working on KINARI, I gained a broad knowledge of protein structure software tools for visualization and analysis, and processing protein structure data from the Protein Databank. I worked with my adviser and two other members of my lab deploying our software in the KINARI-Web server, written in PHP, Javascript, and Jmol scripting. The rest of my research code is mainly written in Python. *Programming languages:* C++, Java, Python, Php, Javascript, Ruby. *Libraries:* Bioruby, OpenBabel, CGAL, Boost. *Frameworks:* CxxTest C++ unit testing framework.

Employment

Computer Science Department, University of Massachusetts, Amherst, MA, 2005–present.
Graduate research assistant: Linkage Laboratory under Prof Ileana Streinu.

Institute for Security Technology Studies, Dartmouth College, Hanover, NH, 2003–2005.
Staff research associate. Worked on a small team as a developer of a research network attack detection system.

Publications

Articles

Naomi Fox and Ileana Streinu. *Redundant Interactions in Protein Rigid Cluster Analysis.* in 1st IEEE International Conference on Computational Advances in Bio and medical Sciences (ICCABS). Orlando, FL, Feb. 3-5, 2011.

Naomi Fox, Filip Jagodzinski, Yang Li, Ileana Streinu. *KINARI-Web: A Web Server for Protein Rigidity and Flexibility Analysis*, http://kinari.linkage.cs.umass.edu Submitted to a computational biology journal, 2011

Workshop posters and presentations

Fox, Naomi, Jagodzinski, Filip, Li, Yang and Streinu, Ileana, *A Web-Based Tool for Rigidity Analysis of Proteins*, in: Biotechnology and Bioinformatics Symposium (BIOT 2009). October 9-10, 2009 Lincoln, Nebraska, Lincoln, Nebraska, 2009.

Naomi Fox, Filip Jagodzinski, Jeanne Hardy, and Ileana Streinu, *How Hydrogen Bonds Affect Protein Rigidity*, in: 23rd Symposium of the Protein Society, Proteins in Motion. July 25-29, 2009 Boston Marriott Copley Place, Boston, Massachusetts, 2009.

Naomi Fox and Filip Jagodzinski (joint work with Audrey Lee St John and Ileana Streinu), *RigDyn: A modular, extensible and user-friendly software platform with tools for rigidity analysis and visualization*, May 11-15, 2008, Workshop on Geometrical Simulation Techniques, Tempe, Arizona, 2008. (presentation)

Naomi Fox (joint work with Filip Jagodzinski, Audrey Lee St John, and Ileana Streinu) *Design of RigDyn* CRA-W Grad Cohort 2006 Workshop, March 31 - April 1. San Francisco, California, 2006. (poster)

Conferences/Workshops attended

IEEE International Conference on Computational Advances in Bio and medical Sciences (ICCABS) 3-5 Feb 2011. Orlando, FL. 2011.
Rigidity Theory and Applications, 2-7 Jan 2010. Bellairs Institute of McGill University, Barbados., 2010.
CRA-W/CDC Workshop on Computational Geometry, 15 Nov. 2009. Tufts University, Medford, MA, 2009.
19th Fall Workshop on Computational Geometry, 13-14 Nov. 2009 Tufts University, Medford, MA, 2009.
23rd Symposium of the Protein Society, Proteins in Motion, 25-29 July 2009. Boston Marriott Copley Place, Boston, MA, 2009.
Biotechnology and Bioinformatics Symposium (BIOT 20009), 9-10 Oct. 2009. University of Nebraska, Lincoln, NE, 2009.
Geometric constraints with applications in CAD and biology Bellairs Institute of McGill University, Barbados. January 3-8, 2009.
18th Fall Workshop on Computational Geometry, Rensselaer Polytechnic Institute, Troy, NY, October 31 - November 1, 2008
17th Fall Workshop on Computational Geometry, IBM T.J. Watson Research Center, Hawthorne, New York, November 9-10, 2007
19th Canadian Conference on Computational Geometry, Carleton University, Ottawa, Canada, August 20-22, 2007
Dynamics under Constraints II, Feb. 2007. Bellairs Institute of McGill University, Barbados., 2007.

16th Fall Workshop on Computational Geometry, Smith College, Northampton, MA, November 10-11, 2006.
Workshop on Dynamics under Constraints, January 2006. Bellairs Institute of McGill University, Barbados., 2006.
15th Fall Workshop on Computational Geometry, University of Pennsylvania, November 18-19, 2005
SPIE Defense + Security, Orlando, FL, March/April 2005
SPIE Defense + Security, Orlando, FL, March 2004

Presentations

Algorithms and Software for Identifying Hydrogen Bonds, September 8, 2010. BioMath Seminar, Smith College, Northampton, MA, 2010.

Applications of Delaunay Tesselations in Proteins, November 20, 2009. Seminar in Advanced Computational Geometry and Applications, Department of Computer Science, UMass, Amherst, MA.

Protein Rigidity, December 2, 2008. Seminar in Computational Biology, Smith College, Northampton, MA.

Bar-and-Joint Rigidity of Proteins, April 8, 2008. Theory Seminar. Department of Computer Science, UMass, Amherst, MA.

Theory and Practice of Molecular Dynamics, March 13 and 15, 2006. Seminar in Computational Biology. Department of Electrical and Computer Engineering, UMass, Amherst, MA.

Teaching

Teaching Assistant, CMPSCI 121: Introduction to Problem Solving with Computers, Using Java. Spring 2007. Led a weekly discussion section. Responsible for holding office hours, grading programming assignments and exams.

Teaching Assistant, CMPSCI 250: Introduction to Computation. Fall 2005. Responsible for holding office hours, grading problem sets and exams, and preparing sample solutions.

Graduate Coursework

Area	Course	Semester
Systems Group 2	Databases	Spring 2008
Systems Group 3	Principles Of Programming Languages	Spring 2007
Theory 1	Theory of Computation	Spring 2006
Theory 2	Algorithms	Fall 2007
AI 1	Artificial Intelligence	Fall 2005
AI 2	Information Retrieval	Fall 2006

Additional Courses

Course	Semester
Seminar in Rigidity Theory	Fall 2005
Seminar in Computational Biology	Spring 2006
Applied Information Retrieval	Fall 2006
Intro to Computer Graphics	Spring 2007
Seminar in Advanced Topics in Computational Geometry	Fall 2007
Theory Seminar	Spring 2008
Research Methods	Spring 2009
Seminar in Computational Geometry	Fall 2009

Service

Professional - Career Development

Invited to speak at the Fifth CRA-W Graduate Cohort Workshop, Seattle, WA, Mar 13-14, 2008 Gave talk with Prof Tiffany Williams, Texas A&M University. "Finding Academic Year Funding"

Speaker at the "Mind the Gap" Career Summit, University of Massachusetts, Amherst, MA, Sept 27, 2007

Participant of the 3rd CRA-W Grad Cohort Workshop, San Francisco, CA, Mar 2-3, 2007

Participant of the 4th CRA-W Grad Cohort Workshop, San Francisco, CA, Mar 31-Apr 1, 2006

Professional - Research community

Assistant to program committee member in paper reviewing for Symposium on Discrete Algorithms (SODA'11), San Francisco, CA, Jan 23-25, 2011

Assistant to referee in paper reviewing for 23rd Annual Symposium on Computational Geometry, Gyeongju, South Korea, June 6-8, 2007

Organizing committee member of 16th Fall Workshop on Computational Geometry, Smith College, Northampton, MA, Nov 10-11, 2006

Departmental

Co-chair of women's group in the UMass computer science department, Jan 2007 - Dec 2007

Graduate Employee Organization Union steward for the UMass computer science department, Sept 2006 - present

Personal

United States Citizen.