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Brian Olson

http://mason.gmu.edu/~bolson3/BrianOlsonCV.pdf

Education

George Mason University
Graduate Student in Computer Science, GPA 3.9/4.0 (estimated duration, 2011-2013)
Passed Ph.D. Qualifying exams on January 25, 2011
Dissertation Proposal on April 2012.

George Mason University
M.S. in Computer Science (2008-2011)

Princeton University
B.S.E. in Computer Science (2005)

Gilman School, Baltimore, MD
Graduate June 2000

Research

Areas: *computational structural biology, biophysics, bioinformatics*
Contributions: novel and powerful probabilistic search algorithms for molecular spaces

1. robotics-inspired sampling-based search projection-guided tree-based search for enhanced sampling of the complex and high-dimensional protein conformational space
2. evolutionary-based probabilistic search for direct sampling of local minima in the rugged protein energy surface

Applications: ab-initio prediction of functionally-relevant protein structures and motions

Publications

1. **Brian Olson**, Kenneth A De Jong, and Amarda Shehu. "Bridging evolutionary computation and computational structural biology: The quest for protein native state." PLoS Comp Biol 2012 (review article, in preparation).
2. **Brian Olson** and Amarda Shehu. "Hopping between Local Minima in the Protein Energy Surface." Proteome Science 2012. (invited special issue, to be submitted)
3. **Brian Olson** and Amarda Shehu. "Populating Local Minima in the Protein Conformational Space." IEEE International Conference on Bioinformatics and Biomedicine (IEEE BIBM), Atlanta, GA, 2011.
4. S.-Farid Hendi, **Brian Olson**, and Amarda Shehu. "Guiding Protein Conformational Search with Projections." J Bioinf and Comp Biol 2012 (to be submitted).
5. **Brian Olson**, S.-Farid Hendi, and Amarda Shehu. "Protein Conformational Search with Geometric Projections." Computational Structural Biology Workshop (CSBW) at IEEE International Conference on Bioinformatics and Biomedicine (IEEE BIBM), Atlanta, GA, 2011.
6. **Brian Olson**, Kevin Molloy, and Amarda Shehu. "In Search of the Protein Native State with a Probabilistic Sampling Approach." J Bioinf and Comp Biol 2011, 9(3):383-398 (invited special issue).
7. **Brian Olson**, Kevin Molloy, and Amarda Shehu. "Enhancing Sampling of the Conformational Space Near the Protein Native State." Intl. Conference on Bio-inspired Models of Network, Information, and Computing Systems (BIONETICS), Boston, MA, 2010 **(best student paper award)**.
8. Amarda Shehu and **Brian Olson**. "Guiding the Search for Native-like Protein Conformations with an Ab-initio Tree-based Exploration." Intl J of Robot Res 2010, 29(8):1106-1127 (invited special issue).

9. Sarah M. Richardson, **Brian S. Olson**, Jessica S. Dymond, Randal Burns, Srinivasan Chandrasegaran, Jef D.Boeke, Amarda Shehu, and Joel S. Bader "Automated Design of Assemblable, Modular, Synthetic Chromosomes." Lecture Notes in Computer Science: Parallel Processing and Applied Mathematics, Wroclaw, Poland, 2009.

Theses

Ph.D. Dissertation Proposal
"Probabilistic Search Algorithms for Modeling Functionally-relevant Structures and Motions in Protein Systems."
Committee : Amarda Shehu (advisor), Jana Kosecka, Jyh-Ming Lien, Kenneth De Jong, and Estela Blaisten-Barojas
George Mason University, April 2012.

M.S. Thesis
"Local Minima Hopping Along the Protein Energy Surface."
Committee : Amarda Shehu (advisor), Jana Kosecka, and Lien Jyh-Ming
George Mason University, November 2011.

Technical Reports

Christopher Miles, **Brian Olson**, and Amarda Shehu. Geometry-based Computation of Symmetric Homo-oligomeric Protein Complexes. Technical Report GMU-CS-TR-2009-2, 2009.

Talks

1. "Populating Local Minima in the Protein Conformational Space." IEEE Bioinformatics and Biomedicine (IEEE BIBM) 2011.
2. "Enhancing Sampling of the Conformational Space Near the Protein Native State." 5th International ICST Conference on Bio-Inspired Models of Network, Information, and Computing Systems, Boston, 2010.
3. Invited Lecture, CS 444 : Introduction to Computational Biology, Spring 2011.
4. Two Invited Lectures, CS 499 : Bioinformatics & Computational Biology I, Spring 2009

Extended Abstracts

Brian Olson, Kevin Molloy, and Amarda Shehu. "Mapping the Protein Conformational Landscape with Adaptive Probabilistic Search." Poster Presentation, Biophysical Society Annual Meeting, March 8, 2011

Awards

Best Student Paper Award. Bionetics Conference, Boston 2010

Events/ Conferences

1. IEEE International Conference on Bioinformatics and Biomedicine (IEEE BIBM), Atlanta, GA, 2011.
2. Biophysical Society Annual Meeting, Baltimore, 2011.
3. 5th International ICST Conference on Bio-Inspired Models of Network, Information, and Computing Systems (BIONETICS), Boston, 2010.
4. RECOMB Satellite on Regulatory Genomics and Systems Biology, Boston, 2009.

Professional Membership

Association for Computing Machinery (ACM) (2009 - Present)
Institute of Electrical and Electronics Engineers (IEEE) (2009 - 2010)

Teaching

George Mason University
Invited Lecture, CS 444 : Introduction to Computational Biology, Spring 2011.
Two Invited Lectures, CS 499 : Bioinformatics & Computational Biology I, Sprint 2009.

Fall 2008
George Mason University
Graduate Teaching Assistant for CS 112 : Introduction to Programming.

Fall 2001, 2003 Spring 2003, 2005
Princeton University
Undergraduate Teaching Assistant for various 100 and 200 level computer science courses.

Ph.D. Study

Graduate Level Courses:

Advanced Metaheuristics	Geometric Algorithms for Bioinfor	Computer Vision
Evolutionary Computation	Analysis of Algorithms	Computer Networks
Adv Artificial Intelligence	Graph Algorithms	Database Management
Intro Artificial Intelligence	Theory of Computation	Quantatative Methods

Skills

Languages: C, C++, C#/.NET, Java, Python
HTML, JavaScript/CSS, ASP, PHP, SQL/ MS T-SQL, XML/XSLT

Tools: Unix and Windows programming environments
Microsoft SQL Server, Visual Studio, XCode

Employment

July 2005-Aug 2008
Microsoft, Redmond, WA
Description : Full time Software Design Engineer (SDE2). I was a member of the back-end data team for the MSN Marketplaces websites. I maintained and developed new features for the SQL Server databases that drive the site. I also developed programs to retrieve data from external partners and was a primary developer on a new content management system.

November 2003-August 2004
Proximities, Inc., Melbourne, FL
Description : Software Development Consultant. I developed a mobile point of sale (POS) application for an RFID enabled PDA. The application is part of a larger POS system connected to a server via WiFi. I also developed a Java GUI client to manage the server. As part of a small start-up company, I was involved in many activities in addition to my software development duties, including overall product development and strategy and hardware troubleshooting.

Summers 1999, 2000, 2001, 2002, 2003
JHPIEGO Corporation, Baltimore, MD
Description : Jr. Database Developer in IT Department. I developed ASP and Visual Basic applications with MS SQL Server back-ends.