

Luqman Hodgkinson

Contact Information

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Research Interests

Algorithms, modularity in biological systems, interactomics, evolutionary biology, systems biology.

Education

- Aug 2007 - present Ph.D. Program, **University of California-Berkeley**, Berkeley, CA
Computational Biology, GPA: 4.00/4.00
- Jan 2005 - May 2007 M.S., Computer Science, **Columbia University**, New York, NY
Master of Science Teaching Assistant Fellow, GPA: 4.00/4.33
- Jun 2003 - Dec 2004 Postgraduate study in Computer Science, **Kent State University**, Kent, OH
Graduate Teaching Assistant, GPA: 4.00/4.00.
- Aug 1998 - May 2003 B.A., Computer Science and Political Science, **Hiram College**, Hiram, OH
Magna Cum Laude, Departmental Honors in Computer Science.
Overall GPA: 3.71/4.00, Computer Science Major GPA: 3.82/4.00.

Honors and Awards

- 2008-2011 Graduate Student Researcher with Professor Richard M. Karp
- 2007 Andrew P. Kosoresow Memorial Award for Excellence in Teaching and Service at Columbia University
- 2005-2006 MSTA Fellowship at Columbia University
- 2004 Graduate Teaching Assistantship at Kent State University
- 2003 Hiney Award in Computer Science at Hiram College
- 2002 Honorable Mention Award in ECC Student Literary Competition
- 2001 Honorable Mention Award in COMAP Math. Contest in Modeling
- 2000 First Award in Geoffrey Hudson Stamm Poetry Contest held by Hiram College
- 1998-2002 President's Scholarship in Hiram College every year

Research Experience

- Jul 2008 - present Modularity Conservation, **University of California, Berkeley**, Berkeley
 Advisor: Professor Richard M. Karp
 Designing, analysing, and implementing algorithms to detect multiprotein modularity conserved during evolution.
- Aug 2006 - May 2007 Pe'er Lab, **Columbia University**, New York, NY
 Advisor: Professor Itsik Pe'er
 Analyzing genetic variation in the isolated human population of Kosrae to determine family relationships and to understand the genetics of heritable diseases.
- Jan 2005 - June 2006 Theory of Computing Group, **Columbia University**, New York, NY
 Advisor: Professor Mihalis Yannakakis
 Researching approximate solutions to #P-complete counting problems using the Markov Chain Monte Carlo and Cross Entropy methods.
- Aug 2003 - Dec 2004 Algorithmic Solutions Lab, **Kent State University**, Kent, OH
 Advisor: Professor Feodor F. Dragan
 Designing and analyzing algorithms for use in ad-hoc wireless communications and sensor networks.
- Dec 2002 - April 2003 Artificial Intelligence, **Hiram College**, Hiram, OH
 Advisor: Professor Ellen L. Walker
 Designing an expert system in Prolog to make credit decisions, interdisciplinary with the Economics department.
- Jan 2002 - May 2003 Algorithms, **Hiram College**, Hiram, OH
 Advisor: Professor Oberta A. Slotterbeck
 Comparing resolution and unification algorithms for logical inference.

Teaching Experience

- University of California-Berkeley**, Berkeley, CA
- Spring 2010 G.S. Instructor, Combinatorial Algorithms and Data Structures
Professor: Richard M. Karp
Graduate course. Duties included leading weekly discussion sections, writing problem set and exam solutions, grading problem sets, maintaining the class website, and answering questions during office hours and by email. During Professor Karp's travels, it was my great privilege to prepare and deliver three lectures: on minimum cost arborescences; amortized analysis and splay trees; and randomized algorithms.
- Fall 2008 G.S. Instructor, Combinatorial Algorithms and Data Structures
Professor: Richard M. Karp
Graduate-level course. Duties included leading weekly discussion sections, writing problem set and exam solutions, grading problem sets, maintaining the class website, and answering questions during office hours and by email. When Professor Karp was attending a conference, it was my great privilege to deliver two lectures on dynamic programming.
- Spring 2008 Graduate Student Instructor, Discrete Mathematics and Probability Theory
Professor: David Wagner
Duties included organizing weekly discussion sections, writing homework solutions, grading exams, explaining concepts to students during office hours, and answering student questions on a discussion board.
- Fall 2007 Graduate Student Instructor, Discrete Mathematics and Probability Theory
Professor: Alistair Sinclair
Duties included organizing weekly discussion sections, designing homework sets, writing homework solutions, grading exams, explaining concepts to students during office hours, and answering student questions on a discussion board.
- Columbia University**, New York, NY
- Spring 2007 Teaching Assistant, Computational Complexity
Professor: Mihalis Yannakakis
Duties included grading homework assignments and explaining concepts to students during office hours and by email.
- Spring 2007 Teaching Assistant, Computability and Models of Computation
Professor: Tal Malkin
Duties included grading homework assignments and explaining concepts to students during office hours and by email. Delivered a lecture on the Pumping Lemma when Professor Malkin was traveling.
- Fall 2006 Teaching Assistant, Computer Architecture, Two units
Professor: Luca Carloni
Duties included grading homework assignments, developing the final project, and explaining concepts to students during office hours and by email.
- Spring 2006 Teaching Assistant, Honors Data Structures and Algorithms, Two units
Professor: Mihalis Yannakakis
Duties included grading homework assignments, holding recitation, and explaining concepts to students during office hours and by email.

- Fall 2005 Teaching Assistant, Computability and Models of Computation
Instructor: Jon Feldman
Duties included grading homework assignments, quizzes, and the final exam and explaining concepts to students during office hours and by email. When Professor Feldman presented a paper at the FOCS conference on October 24, 2005, as one of the most significant events of my life at the time, I delivered the lecture proving the computational equivalence of ordinary Turing machines, multi-tape Turing machines, and nondeterministic Turing machines.
- Fall 2004 **Kent State University, Kent, OH**
Instructor, Introduction to Computer Science
Class Website: <http://www.cs.kent.edu/~lhodgkin/CS10051>
Duties included lecturing, grading, designing and administering exams, developing a class structure, a syllabus, and a website, and, most importantly, helping students learn the fundamentals of computer science.
- Spring 2004 Lab Instructor, Introduction to Computer Science, Two sections
Duties included introducing new concepts at the beginning of each lab, assisting students one-on-one during lab, grading lab reports and programs, holding office hours, and answering student email.
- Fall 2000 **Hiram College, Hiram, OH**
Teaching Assistant, Defining America: Family Values and Culture Wars
Professor: Ralph Cebulla
Duties included helping first-year students adjust to college life, grading papers, and participating in group discussions.
- Summer 2000 Teaching Assistant, Computer Literacy
Instructor: Susan Boyle
Duties included helping adult learners with the Microsoft Office Suite during scheduled labs, grading student assignments, and answering email.

Publications

- Hodgkinson L, Karp RM (2012) Algorithms to detect multiprotein modularity conserved during evolution. *IEEE/ACM Trans. on Computational Biology and Bioinformatics* 9:1046-1058.
- Hodgkinson L, Rosa J, Brewer EA (2012) Parallel software architecture for experimental workflows in computational biology on clouds. PPAM 2011. LNCS 7204:281-291.
- Hodgkinson L, Karp RM (2011) Algorithms to detect multiprotein modularity conserved during evolution. ISBRA 2011. LNBI 6674:111-122.
- Hodgkinson L, Karp RM (2011) Algorithms to detect multi-protein modularity conserved during evolution. EECS Department, University of California, Berkeley, Technical Report UCB/EECS-2011-7.
- Hodgkinson L, Walker E (2003) An expert system for credit evaluation and explanation. *Journal of Computing in Small Colleges* 19:62-72.

Conference Talks

- Parallel software architecture for experimental workflows in computational biology on clouds, at the Workshop on Parallel Computational Biology (PBC/PPAM 2011), Torun, Poland, September, 2011.
- Algorithms to detect multiprotein modularity conserved during evolution, at the 7th International Symposium on Bioinformatics Research and Applications (ISBRA 2011), Central South University, Changsha, P. R. China, May, 2011.
- CEEES: Credit Evaluation and Explanation Expert System, at the 10th Annual Consortium for Computing in Small Colleges Midwest Conference (CCSC:MW'03), Granville, OH, October, 2003.

Professional Activities

- Served as reviewer for BioSystems, 2012.
- Served as graduate student volunteer for Tapia Conference to Celebrate Diversity in Computing at University of California, Berkeley, 2011.
- Served as volunteer assistant to Professor Alfred V. Aho during the 4th Annual International Symposium on Code Generation and Optimization (CGO-4) at Columbia University.
- Member of the ACM, IEEE, and ISCB.

Significant Extracurricular Accomplishments

- 2001-2002 Student Body President at Hiram College
 2000-2001 English Society President at Hiram College

Relevant Coursework

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| Protein Informatics Laboratory | University of California, Berkeley | A+ |
| Introduction to Protein Informatics | University of California, Berkeley | A+ |
| Advanced Topics in Computer Systems | University of California, Berkeley | A |
| Computational Aspects of Evolution | University of California, Berkeley | A |
| Computational and Mathematical Population Genetics | University of California, Berkeley | A |
| Statistical Phylogenetics | University of California, Berkeley | A |
| Advanced Topics in Statistical Learning Theory | University of California, Berkeley | A |
| Statistical Learning Theory | University of California, Berkeley | A+ |
| Computational and Genomic Biology | University of California, Berkeley | A |
| General Genetics | University of California, Berkeley | A+ |
| General Biology: Plants and Fungi, Evolution, Ecology | University of California, Berkeley | A+ |
| General Biology Laboratory | University of California, Berkeley | A+ |
| General Biology Lecture: Molecules and Cells, Genetics, Physiology | University of California, Berkeley | A+ |
| Organic Chemistry Laboratory | University of California, Berkeley | A |
| Chemical Structure and Reactivity: Organic Chemistry | University of California, Berkeley | A+ |
| Introductory Physics: Mechanics, Waves, Fluids, Thermodynamics | University of California, Berkeley | A+ |
| Computational Human Genetics | Columbia University | A+ |
| Introduction to Genomic Information Science and Technology | Columbia University | A |
| Quantum Computation | Columbia University | A |
| Analysis of Algorithms: Approximation Algorithms | Columbia University | A |
| Computational Complexity | Columbia University | A |
| Probability and Statistics | Columbia University | A |
| Honors Mathematics IV | Columbia University | A+ |
| Honors Mathematics III | Columbia University | A+ |
| Analysis of Algorithms | Columbia University | A |
| Programming Languages and Translators | Columbia University | A+ |
| Artificial Intelligence | Columbia University | A |
| Advanced Programming | Columbia University | A+ |
| Advanced Algorithms | Kent State University | A |
| Computational Geometry | Kent State University | A |
| Automata, Formal Languages, and Computation | Kent State University | A |
| Wireless Networks | Kent State University | A |
| Operating Systems | Kent State University | A |
| Advanced Computer Architecture | Kent State University | A |
| Computer Architecture | Kent State University | A |
| General Chemistry: Structure and Bonding | Hiram College | A |
| Database Design | Hiram College | A |
| Software Engineering | Hiram College | A |
| Parallel and Distributed Computing | Hiram College | A |
| Computer Organization | Hiram College | A |
| Data Structures and Algorithms | Hiram College | A |
| Object-Oriented Programming | Hiram College | A |
| Introduction to Computer Science | Hiram College | A |