

# Ali S. Erkan, Ph.D.

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**2011 ▶ 2012:** Sosyal Bilimler Fakültesi, Zemin Kat 04  
Rumeli Feneri Yolu, Koç University, Sarıyer, Istanbul, Turkey  
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## Professional Experience

Fall 2011 ▶ Spr 2012: **Fulbright Researcher, Koç University, Istanbul, Turkey**  
Fall 2010 ▶ present: **Associate Professor of Computer Science, Ithaca College, NY**  
Fall 2004 ▶ Spr 2010: **Assistant Professor of Computer Science, Ithaca College, NY**  
Spr 2001 ▶ Spr 2004: **Visiting Instructor of Computer Science, Swarthmore College, PA**

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## Education

### Ph.D. **Computer Science, Lehigh University**

Dissertation: *Application of Hard Real-Time Scheduling Algorithms in Periodic Network Transmissions*

- Adaptation of periodic hard real-time scheduling techniques for message transmission protocols in surveillance networks.
- Investigation of average-case schedulability behavior of Distance Constrained Scheduling (DCS) and Rate Monotonic Scheduling (RMS).
- Establishment of DCS's superiority over RMS in schedulability and in absorption of latency/jitter characteristics of real network traffic.

### M.S. **Computer Science, Lehigh University**

Thesis: *Implementation of a Monitoring System for Distributed Systems*

- Development of an object oriented and dynamically configurable instrumentation API to monitor the network communications of distributed applications.
- Provision of runtime support for definitions/redefinitions of monitoring events, addition/removal of processes from the monitoring cycle, activation/deactivation of monitoring messages for reducing instrumentation overhead.

### B.S. **Computer Engineering, Lehigh University**

- Minor in Economics.

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## Grants and Fellowships

- 6/2012 ► 12/2013 **Untangling the Web of Historical Thinking: What the Structures of Student-Produced Wikis Reveal**  
Michael Smith, Ali Erkan  
NATIONAL ENDOWMENT FOR THE HUMANITIES, HD-51431 \$50,000  
Structural analysis of student-produced wikis in an introductory history course; quantitative assessment of the extent to which students represent historical knowledge in relational and non-linear ways; creation of the necessary scaffolding for students to represent multi-dimensional (e.g. historical, political, socio-economical) content.
- 9/2011 ► 5/2012 **Using Geographic Information Systems For Cross-Cultural Scholarship**  
FULBRIGHT U.S. SCHOLAR PROGRAM  
The establishment of an open source Geographic Information System (GIS) for humanists interested in international collaborations and scholarly information exchange; the creation of infrastructure and instructional material to make the associated computational technology available and helpful to those who are currently unaware of its existence. (Hosted by Koç University, Istanbul, Turkey.)
- 6/2010 ► 6/2012 **Educating the Educator: Integrative Learning Through GIS**  
John Barr, Ali Erkan  
ITHACA COLLEGE \$29,250  
Design of an open source Geographic Information System (GIS) course for faculty members of non-computational departments for their discipline-specific spatial data processing needs in scholarship and teaching.
- 6/2009 ► 6/2012 **Multidisciplinary Sustainability Modules: Integrating STEM Courses**  
Tom Pfaff, Ali Erkan, Jason Hamilton, Michael Rogers  
NATIONAL SCIENCE FOUNDATION, DUE-0837721 \$149,104  
Creation of multidisciplinary and sustainability themed educational modules for students from different disciplines working collectively, iteratively, but not necessarily simultaneously, by exchanging technical reports.

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## Single-Semester Funding

- Fall 2010 **Switching to an Open Source Geographic Information System**  
CENTER FOR FACULTY RESEARCH & DEVELOPMENT, ITHACA COLLEGE 3 credits
- Spr 2010 **Creation of a Computer Based System To Better Understand The Academic Interests and Perspectives of Incoming Students**  
CENTER FOR FACULTY RESEARCH & DEVELOPMENT, ITHACA COLLEGE 3 credits
- Spr 2008 **The Use of Virtualization for Computer Networking Education**  
HUMANITIES & SCIENCES EDUCATIONAL GRANT, ITHACA COLLEGE \$900
- Fall 2007 **Wiki Systems in Humanities Pedagogy**<sup>1</sup>  
CENTER FOR FACULTY RESEARCH & DEVELOPMENT, ITHACA COLLEGE 3 credits

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<sup>1</sup>With Michael Twomey, Department of English, Ithaca College.

- Fall 2006 **A Novel Approach in Using Wiki Systems For Academic Research**  
 CENTER FOR FACULTY RESEARCH & DEVELOPMENT, ITHACA COLLEGE 3 credits
- Spr 2006 **Configuration of a Mobile Solar Panel for the Center for Natural Sciences**<sup>2</sup>  
 ITHACA FUND, ITHACA COLLEGE \$900
- Sum 2003 **A Simulation Based Verification of the Allen-Cunneen Approximation in Queuing Networks with non-Markovian Traffic Sources**  
 UNDERGRADUATE SUMMER RESEARCH, SWARTHMORE COLLEGE \$3,750
- Sum 2003 **Deterministic Media Access & Bandwidth Allocation for Periodic Streams**  
 UNDERGRADUATE SUMMER RESEARCH, SWARTHMORE COLLEGE \$3,750
- Spr 2002 **Dir-To-Web: A Tool to Create Course Web Pages**  
 FIGLEAF<sup>3</sup>, SWARTHMORE COLLEGE \$1,000

## Awards and Recognitions

Fall 2009 - Spr 2010: **Level II Departmental (Computer Science) Merit Award**

Fall 2008 - Spr 2009: **Level II Departmental (Computer Science) Merit Award**

Fall 2008 - Spr 2009: **Level II Dean Merit Award**

For H&S Senate work of the associated academic year.

Fall 2006 - Spr 2007: **Level II Departmental (Computer Science) Merit Award**

Spr 2007: **Ithaca College Faculty Excellence Award Nomination**

Nominated by an undergraduate.

Spr 1996: **Fellowship, EECS Department, Lehigh University**

Sum 1995: **Ph.D. Qualifier Exam Record**

Only graduate student in the history of the EECS department at Lehigh University to earn a high-pass in the Databases, Compilers, Automaton and & Grammars exams.

Spr 1994: **Arthur E. Humphrey Teaching Assistant Award, Lehigh University**

Recipient for Lehigh University Engineering College. This award is given once a year to a teaching assistant from each of the three undergraduate colleges of Lehigh University. Nominations are solicited from undergraduates to honor teaching excellence.

## Service

2007 ► present: System/network administration for departmental Linux systems, accounts, servers.

Spr 2011: Google-doc port of departmental policy/procedure/curricular documents.

Fall 2010 - Spr 2011: Mentoring group leader for IC Faculty development.

<sup>2</sup>With Beth Clark Joseph, Department of Physics, Ithaca College.

<sup>3</sup>Faculty Initiative Grants for eLElectronic Access in the Future.

Spr 2011: Environmental Studies and Science department search committee member.

Fall 2010: Ithaca College provost search.

Spr 2010: Environmental Studies and Science department search committee member.

Fall 2010 - Spr 2011: Environmental Studies and Science department steering committee member.

Fall 2009 - Spr 2010: School of Humanities and Sciences marketing committee member.

Fall 2009 - Spr 2010: Computer Science department search committee member.

Spr 2009 - Fall 2009: Computer Science department assessment committee member.

Spr 2009: Paper reviewer for the ITICSE 2009 conference.

Spr 2009: All college Faculty Development advisory committee member.

Fall 2008 - Spr 2009: School of Humanities and Sciences Faculty Senator, execute committee member.

Spr 2008: School of Humanities and Sciences Liberal Arts Education committee member.

Fall 2007 - Spr 2008: Computer Science department search committee member.

Fall 2007 - Spr 2008: School of Humanities and Sciences Faculty Senator.

Spr 2007: Coach for CCSCNE 2007 programming contest team (Sigurd Teigen, Ross Skaliotis, Max Sipos) which ranked 2nd out of 42 teams.

Spr 2007: Coach for MCM 2007 contest team (Can Coler, Kris Georgiev); honorable mention.

Fall 2007: Computer Science department new CS minor committee member.

Fall 2006 - Spr 2007: Paper director for the CCSCNE 2007 Conference.

Fall 2006: Computer Science department certification committee member.

Fall 2006: Computer Science department CS/BS major evaluation committee member.

Fall 2006: Computer Science department CS1/CS2 assessment committee member.

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## Academically Significant Work Experience

- Spr 1993 ► Fall 1997: **Teaching Assistant: Lehigh University**  
 Instruction and assistance with the “Introduction to Programming” (instructor status), “Computer Networks”, “System and Network Administration”, “Structured Programming and Data Structures”, and “Operating Systems” courses.
- Spr 1997 ► Fall 1999: **System/Network Administrator: VastLab, Lehigh University**  
 Maintenance of the Linux, Solaris, and MS Windows workstations and the local area network for Dr. Terry Boulton’s Vision and Software Technology Lab.
- Spr 1996 ► Fall 1996: **Programmer: Accusort, Telford, PA**  
 Development of a novel software system to weigh cargo packets on conveyor belts automatically and on the fly.
- Fall 1993 ► Spr 1996: **Newsletter Editor: IEEE, Lehigh Valley Section**  
 Design and typesetting of the regional newsletter.

Fall 1991: **ITS member: Fresco, Telford, PA**

General information systems support, staff training, some database administration.

1990: **Programmer: Lehigh University/Dryden Press**

Development of a spreadsheet-type tool to visualize economic trends in introductory economics classes; funding by Dryden Press; direction by Dr. Richard Aronson.

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## Papers

- [1] Ali Erkan, Tom Pfaff, Jason Hamilton, and Michael Rogers. Multidisciplinary problem solving in data structures and algorithms. In *SIGCSE '12: Proceedings of the 43rd SIGCSE technical symposium on Computer Science education*, page numbers yet to be determined, New York, NY, USA, 2012. ACM.
- [2] John Barr and Ali Erkan. Educating the educator through computation what GIS can do for CS. In *SIGCSE '12: Proceedings of the 43rd SIGCSE technical symposium on Computer Science education*, page numbers yet to be determined, New York, NY, USA, 2012. ACM.
- [3] Tom Pfaff, Ali Erkan, Jason Hamilton, and Michael Rogers. Multidisciplinary engagement of calculus students in climate issues. *Science Education and Civic Engagement: An International Journal*, January 2011.
- [4] Tom Pfaff, Michael Rogers, Ali Erkan, and Jason Hamilton. Go figure: Calculus students' use of figures and graphs in technical report writing. *Numeracy*, 4(1), 2011.
- [5] Jason G. Hamilton, Michael Rogers, Thomas J. Pfaff, and Ali Erkan. Multidisciplinary collaborations in the traditional classroom: Wrestling with global climate change to improve science education. *Transformations: The Journal of Inclusive Scholarship and Pedagogy*, XXI(1):89–98, Spring-Summer 2010.
- [6] Ali Erkan, Jason Hamilton, Tom Pfaff, and Michael Rogers. Use of satellite imagery in multidisciplinary projects. In *SIGCSE '10: Proceedings of the 41th SIGCSE technical symposium on Computer Science education*, pages 32–37, New York, NY, USA, 2010. ACM.
- [7] Ali Erkan, **Sam Newmark** (Math & CS '09, Ithaca College), and **Nicolas Ommen** (Math & CS '09, Ithaca College). Exposure to research through replication of research: a case in complex networks. In *ITiCSE '09: Proceedings of the 14th annual ACM SIGCSE conference on Innovation and technology in computer science education*, pages 114–118, New York, NY, USA, 2009. ACM.
- [8] Ali Erkan. TIG: A utility for generating course web pages and a case study for teaching data structures. *Journal of Computing Sciences in Colleges*, 24(6):71–77, 2009.
- [9] Ali Erkan and **Diyan Gochev** (CS '08, Ithaca College). An image background detection project for a visual exploration of DFS and BFS. In *SIGCSE '08: Proceedings of the 39th SIGCSE technical symposium on Computer science education*, pages 483 – 487, New York, NY, USA, 2008. ACM.
- [10] Ali S. Erkan, **T. J. VanSlyke** (CS '07, Ithaca College), and **Timothy M. Scaffidi** (CS '07, Ithaca College). Data structure visualization with L<sup>A</sup>T<sub>E</sub>X and Prefuse. In *ITiCSE '07: Proceedings of the 12th annual SIGCSE conference on Innovation and technology in computer science education*, pages 301–305, New York, NY, USA, 2007. ACM.
- [11] Ali Erkan and **Sigurd Teigen** (CS & Math '08, Ithaca College). Integration of OPNET modeler with external development tools in Linux/Solaris. OPNETWORK, 2006.

- [12] Ali Erkan and **Zac Rider** (CS '04, Swarthmore College). Deterministic media access and bandwidth allocations for periodic streams. OPNETWORK, 2003.
  - [13] Ali Erkan and **Joshua Hudner** (CS '04, Swarthmore College). A simulation based study of the Allen-Cunneen approximation in queuing networks with non-Markovian traffic sources. OPNETWORK, 2003.
  - [14] T. E. Boulton, R. Micheals, X. Gao, P. Lewis, C. Power, W. Yin, and A. Erkan. Frame-rate omnidirectional surveillance and tracking of camouflaged and occluded targets. In *Second IEEE International Workshop on Visual Surveillance*, pages 48–55, 1999.
  - [15] Terry Boulton, R. Micheals, A. Erkan, P. Lewis, C. Powers, C. Qian, and W. Yin. Frame-rate multi-body tracking for surveillance. In *Proc. of the DARPA IUW*, pages 305–313. DARPA/ISO, Morgan Kaufmann Publishers, Inc, 1998.
  - [16] Terry Boulton, Chen Qian, Weihong Yin, Ali Erkan, Peter Lewis, Chris Power, and Ross Micheals. Applications of omnidirectional imaging: Multi-body tracking and remote reality. In *Proceedings of the 4th IEEE Workshop on Applications of Computer Vision (WACV'98)*, WACV '98, pages 242–, Washington, DC, USA, 1998. IEEE Computer Society.
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## Technical Reports

- [1] Ali Erkan and T.E. Boulton. Survey of periodic real-time scheduling systems. Lehigh University, 1998.
  - [2] Ali Erkan. A parallel recursive matrix inversion system using PVM. Lehigh University, 1997.
  - [3] Ali Erkan. Dynamic interconnection topologies for concurrent systems. Lehigh University, 1996.
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## Presentations

- [1] Ali Erkan, John Barr, Michael Trotti, Nancy Menning, Julie Nastasi, and Dispensa Marilyn. Geographic information systems *ic<sup>2</sup>* project: Past projects and new initiatives. Envisioning a Positive Future: Tools and Strategies for Innovative Approaches to Teaching, Ithaca College, Ithaca, N.Y., May 24, 2011.
- [2] Ali Erkan. From fireflies to Facebook: It's all about connections. Ithaca Today Sampler Session, Ithaca College, Ithaca, N.Y., April 16, 2011. This presentation was also given on 4/17/2010 and 4/18/2009 (the last one with Teresa Zollo).
- [3] Henry M. Walker, Ali Erkan, Mark Guzdial, and Steve Cooper. Role and value of quantitative instruments in gauging student perspectives in a computing curriculum. In *Proceedings of the 42nd ACM technical symposium on Computer science education, SIGCSE '11*, pages 321–322, New York, NY, USA, 2011. ACM.
- [4] Susanne Morgan, Carol Henderson, Dennis Charsky, Ali Erkan, and Marilyn Dispensa. The Ithaca College Faculty Commons: Web 2.0 gateway to faculty development. 35th Annual POD Conference, St. Louis, Missouri, November 3-7 2010.
- [5] Ali Erkan. Exposure to research through replication of research: a case in complex networks. Invited talk The 2010 HarambeeNet workshop, Duke University, Durham, North Carolina, July 8-9 2010.

- [6] Michael Smith and Ali Erkan. Wikis as concept maps. Faculty Institute, Ithaca College, Ithaca, N.Y., May 25, 2010.
  - [7] Michael B. Smith, Ali Erkan, Jeff McClurken, and Jim Groom. Learning history in a digital age: Some experiments with “digital natives”. Panel at the International Society for the Scholarship of Teaching & Learning (ISSOTL) conference, October 22-25 2009.
  - [8] Ali Erkan, Jason Hamilton, Tom Pfaff, and Michael Rogers. Can you have social justice if your village is under water. The First Summit on Incorporating Social Justice and Service-Learning into the STEM Curriculum, Ithaca College, Ithaca, N.Y., June 11-12 2009.
  - [9] David Gries, Michael Eckmann, Ali Erkan, and James Heliotis. Discrete mathematics/structures: how do we deal with the late appreciation problem? *Journal of Computing Sciences in Colleges*, 24(6):110–112, 2009.
  - [10] Ali Erkan and Michael Smith. Wikis and student engagement. 19th Annual Educational Technology Day, Ithaca College, Ithaca, N.Y., March 23, 2009.
  - [11] Michael Smith and Ali Erkan. Wikis as concept maps. Ithaca College Faculty Commons Colloquium, Ithaca, N.Y., February 25, 2009.
  - [12] Ali Erkan and Michael Twomey. Wiki systems in humanities pedagogy. Spring Faculty Conference, Ithaca College, Ithaca, N.Y., May 15, 2008.
  - [13] Ali Erkan. D2W: A program to automatically generate web pages for distribution of course material. Tri-College (Swarthmore, Byrn Mawr, Haverford) Math, Science & Technology Teaching Symposium, Bryn Mawr College, Byrn Mawr, PA, May 2003.
  - [14] Ali Erkan. An object oriented and dynamically configurable instrumentation interface for monitoring distributed applications. Mid-Atlantic States Graduate Student Workshop on Programming Languages and Systems, 1995.
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## Supervised Student Presentations

- [1] Blake Balick-Schreiber, Richard Roberts, and Drew Winston. Investigating an institution as a network. Oral presentation at NCUR 2011, March 31st, 2011. The project (which was originally named “IC Network View Project”) was started during Fall 2010 by Allison Boos, Blake Balick-Schreiber, Juan Duchimaza, Evan Hong, Marc Howard, Richard Roberts, Jared Vinci, and Drew Winston. The presenters were the ones who continued progress during Spring 2011.
- [2] Marc Howard, Jared Vinci, Allison Boos, and Jon White. iPad disorder diagnostics application for a DSM-IV. Poster presentation at NCUR 2011, March 31st, 2011. The project was co-sponsored by Bill Hudenko (then at Ithaca College, currently at Dartmouth College).
- [3] Kelly Christian, David Banker, Steven Lam, and Michael Myhre. Environmental trends: An analysis of the ice concentration in the Arctic. Poster presentation at NCUR 2011, March 31st, 2011.
- [4] Drew Winston. Wikis in pedagogy. Oral presentation at NCUR 2011, March 31st, 2011. Drew was the primary student programmer on the “Wikis in Pedagogy” project during the summer of 2011.

- [5] Richard Roberts. Cellular automata modeling of feed-forward motifs with variable reaction rates. Poster presentation at NCUR 2011, March 31st, 2011. This was co-sponsored by Danail Bonchev from the Bioinformatics and Bioengineering Summer Institute of Virginia Commonwealth University.
  - [6] Nick Ommen and Sam Newmark. Exposure to research through replication of research: A case in complex networks. Whalen Symposium, Ithaca College, April 2009. Also presented at the Hudson River Undergraduate Mathematics Conference, 2009.
  - [7] Emily Mitchell. Identification of CpG islands in genomic sequences. Virginia Commonwealth University Bioinformatics and Bioengineering Summer Institute, August 2007. Project co-advised by Zhongming Zhao (Ph.D), VCU.
  - [8] Nick Ommen. Integration through recurrence relations and its applications to calculus. Whalen Symposium, Ithaca College, April 2007. Also presented at the Hudson River Undergraduate Mathematics Conference, 2007.
  - [9] Sigurd Teigen. Integration of OPNET Modeler with external development tools. OPNETWORK, Washington DC, August 2006.
  - [10] Nitin Rajan. The Ithaca College Solar Trailer project: A mobile power source concept. Whalen Symposium, Ithaca College, April 2006. This project was co-advised by Beth Ellen Clark Joseph (Physics).
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## Senior Projects

- [1] Jared Vinci. Building an iPad application for assistance in clinical interviews, spring 2011. Continuation of the Fall 2010 project of the same name.
- [2] Marc Howard and Allison Boos. Building an ipad application for assistance in clinical interviews, fall 2010.
- [3] Michael Cashman and Hristo Nikolov. CMS based repository design for multidisciplinary course communications, fall 2010.
- [4] Andrada Voinitchi. A computer-based system to better understand the role of gender in children's decision making, spring 2010.
- [5] Andrew Wyshak and Rodion Catargiu. Geographic Information Systems (GIS), spring 2009.
- [6] Sam Newmark and Nicolas Ommen. Complex networks simulations, fall 2008.
- [7] David Beiler, Alex Dragusin, and Michael Philippone. Creation of a GUI front-end for Octave, spring 2008. Co-sponsored with Osman Yürekli (Mathematics), John Macelli (Mathematics).
- [8] Ross Skaliotis. Implementation of a BGP daemon, fall 2007.
- [9] Sigurd Teigen and Diyan Gochev. A comparison of Rate Monotonic Scheduling (RMS) and Distance Constrained Scheduling (DCS), fall 2007.
- [10] Michael Chealander and Alex Weber. Beatboxing to MIDI using MaxMSP, spring 2007.
- [11] T. J. Van Slyke and Tim Scaffidi. Java program visualization using Prefuse, fall 2006.
- [12] Colin Hinkley and Ryan Healey. Evolution of wiki sites, spring 2006.

- [13] Rishi Gupta and Eric Salluci. VMWARE based virtual networking, spring 2006.
- [14] Ryan Weeks and Brian Kropa. A comparison of DSR and AODV with JiST, fall 2005.
- [15] Alex Cain and Gregory Sibley. Auto generated ADT visualizations, fall 2005.

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## Courses Taught At Ithaca College

	Web Programming	Discrete Mathematics	Principles of Computer Science	Java Programming	Intro to Comp with Matlab	Geographic Information Systems	Computer Organization	Data Structures	Algorithms	Computer Networks	Discrete Event Simulations	Complex Networks
Fall 2004		✓							✓			
Spring 2005								✓		✓		
Fall 2005			✓							✓		
Spring 2006								✓			✓	
Fall 2006									✓	✓		
Spring 2007							✓					✓
Fall 2007					✓				✓	✓		
Spring 2008				✓				✓				
Fall 2008	✓				✓					✓		
Spring 2009					✓				✓			
Fall 2009						✓		✓		✓		
Spring 2010					✓		✓		✓			
Fall 2010								✓				✓
Spring 2011						✓			✓			

- **COMP-190** is the 100 level topics courses and is thus used for “**Intro to Comp with Matlab**” and “**Geographic Information Systems**” despite their mutually exclusive content.
- **COMP-490** is the 400 level topics courses and is thus used for “**Discrete Event Simulations**” and “**Complex Networks**” despite their mutually exclusive content.

### COMP-115: Discrete Mathematics

An introduction to the most common form of mathematics required in computer science. Topics include sets, functions, relations, matrix algebra, combinatorics and finite probability, recurrence relations, logic, mathematical induction, and algorithmic thinking.

### COMP-171: Principles of Computer Science

An introduction to the Computer Science and Computer Information Science majors. The main goal is to develop object oriented techniques to effectively solve problems using C++.

### COMP-190: Introduction To Computation with MatLab - New Course

A scientific introduction to computation using the mathematics system MatLab with instructional as well as assigned problems drawn from statistics, bioinformatics, image processing, cellular automaton, and stochastic systems.

**COMP-190: Geographic Information Systems - New Course**

This course covers the fundamentals of Geographic Information System (GIS) technology, with the emphasis placed on analysis, presentation, and GIS driven problem solving. Students complete a series of lab exercises that illustrate the typical steps in a GIS project. The course culminates with students carrying out their own GIS project.

**COMP-210: Computer Organization**

An exposition of the central ideas in a computer system. Although the conceptual work is based on a simulation system, students also complete many small scale C programs in order to interact with an actual system. Topics include computer architecture, assembly language, operating systems, systems programming, processes, memory management, digital logic, and file systems.

**COMP-220: Data Structures**

Continuation of "Principles of Computer Science" but the emphasis is now on data structures, their implementation, application, and efficiency. Topics include dynamic allocation, templates, comparison of alternative implementations of user-defined data structures, complexity, performance, recursion, and tree traversal algorithms.

**COMP-311: Algorithms**

A formal treatment of program solving techniques. Topics include divide-and-conquer techniques, decrease-and-conquer, transform-and-conquer, dynamic programming, string matching, hashing, and greedy techniques. The last two weeks of the semester is an introduction of basic computability (tractability, P/NP/NP-complete classes).

**COMP-365: Computer Networks**

Introduction to computer networks, centered around the underlying models, technologies, and protocols. The main case study is TCP/IP networks, although time is also spent on ATM networks to be exposed to a second design alternative. The hands-on component of the course is the development of a number of Java based networking programs.

**COMP-490: Discrete Event Simulation Systems - New Course**

Follow-up to Computer Networks. As of the first offering, it is based on a semester long group-based research project related to scheduling algorithms and ad-hoc wireless networks. I designed this course for students interested in conducting simulations for networking research.

**COMP-490: Complex Networks - New Course**

Follow-up to Computer Networks and Algorithms. Based on a formal study of the structure and function of technological (e.g., the Internet, the WWW), social (e.g., acquaintances, friendships), biological (e.g., metabolic pathways, food webs), informational (e.g., co-authorships, bibliographic interconnections), and cognitive (e.g., phonological associations) networks. I designed this course for students interested in graduate level research, specifically with a cross-disciplinary flavor.

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## Courses Taught At Swarthmore College

	C & UNIX	Alg & OO Programming	Advanced Topics in Alg	Network Modeling	Network Programming	Computer Networks
Spring 2001	✓			✓	✓	✓
Fall 2001	✓			✓		
Spring 2002	✓				✓	
Fall 2002	✓	✓				
Spring 2003	✓	✓				
Fall 2003		✓				✓
Spring 2004	✓		✓			

- **CS-97** is the senior seminar course. I have though it three different ways which is why three different topics are listed under the same course name/number.
- **CS-48** and **CS-91** were to be the official course numbers for the network modeling and computer networks courses which were first covered as as topics in senior seminar.

### **CS-21: C & Unix: The Imperative Paradigm**

Introduction to fundamental aspects of computing; focus on problem solving and software design concepts using the C programming language.

### **CS-35: Algorithms and Object-Oriented Programming**

Object-oriented programming in Java, advanced data structures (priority queues, trees, hash tables, graphs, etc.) and algorithms, software design and verification.

### **CS-48: Network Modeling - New Course**

Introduction to the modeling of data networks; survey of the subsets of probability and matrix algebra necessary for studying Markov models and queuing systems; survey of selected papers based on stochastic processes; introduction to network simulations.

### **CS-91: Computer Networks - New Course**

Survey of the key aspects of networking systems, ranging from data-link layer up to and including application layer. Investigation of network research via recent publications.

### **CS-97: Network Programming - New Course**

Introduction to network programming using TCP/IP sockets and UNIX IPC mechanisms. Development of an API to mimic the behavior of wireless networks.

### **CS-97: Advanced Algorithms - New Course**

Designed for students interested in graduate level work. Topics include graph flows, matrix operations, linear programming, Markov modeling, string matching, computational geometry, and approximation algorithms for NP complete problems. Each topic concludes with a paper that builds on the material covered for that topic.