

MSCS



Mess

Department of Mathematics, Statistics and Computer Science
St. Olaf College
Northfield, MN 55057

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This Week's Colloquium

Title:	Close the Gate, Lock the Doors, Boot Unix: The "Middle Ages" of computing at St. Olaf, and how a bit of history can change your life
Speaker:	Carl Albing '77
Time:	Tuesday, November 8, 7:00 p.m. (treats following the talk)
Place:	SC 182

Thirty years ago this month, three St. Olaf students brought up a Unix system here on the St. Olaf campus—quite likely the first one anywhere in Minnesota. It revolutionized computing at St. Olaf, and the ripple effect of that event can still be felt today. (If you have ever used a Linux system or a supercomputer, then you have a connection to those early days.)

Carl Albing '77, one of those three pioneering students, will take us back in time and technology, describing conditions in "the Middle Ages" of computing at St. Olaf and offering some thoughts on what the intervening 30 years have taught us about computing, the liberal arts, the current job market, and the future of computing.

Join us for a quick trip through computing history with some time for reflection on where

we've been and where we are now. It may change your future—or at least the way you look at the past.

Carl Albing is a software consultant, manager, analyst and programmer with an amazing breadth of software experience. After receiving his B.A. in mathematics at St. Olaf, Carl did graduate work in computer science and received an International MBA. He currently works for Always Computing, Inc. and for the supercomputer company Cray, Inc.

Bowling with the Profs!

The MAA would like to request YOUR presence at the MSCS department's annual Bowling with the Profs Night. Come down to Jesse James Lanes this Wednesday, November 9 at 8:00 p.m. to show off your bowling skills or just mock everyone else's. The MAA will pay for the fun, but you'll need to rent or bring your own shoes. If you need a ride, or can offer one to others, meet at OMH at 7:50. Email Phil Schulte at schulte@stolaf.edu with questions.

Problem of the Week (POW)

A train is made up of Boxcars, Flat cars, and Hopper cars. Boxcars weigh 25 tons, and Flat cars and Hopper cars weigh 50 tons each. How many different trains of total weight 1000 tons (ignoring caboose and engines) can be made up? Trains are considered identical if and only

if they have the same sorts of cars in the same order: eg./ HHB, HBH, and FBH are distinct trains of total weight 125 tons.

*** Please submit all solutions by Wednesday at noon to Amelia Taylor by e-mail (ataylor@stolaf.edu) or by placing them in her box at OMH 201.

Announcing a New Interim Course

CS 350: Advanced Team Project (ATP)

This new course allows students to spend Interim working on a team research project. Several pre-approved projects are available (see the CS web site for a complete list): one is accessible to students with a strong CS 251 (or CS 125) background; others require CS 284 or comparable Java programming experience; some call for a knowledge of (or willingness to learn) languages such as PHP or Javascript. At least two students must work on each project in the course, but different teams may work on different projects.

Interested? Want to know more about the projects? Contact Dick Brown (rab@stolaf.edu) or check out the CS web site at www.cs.stolaf.edu.

Announcing More Spring Courses

Math 224: Investigative Mathematics

This course is ideally suited to students who are currently enrolled in Linear Algebra, but students currently enrolled in Calculus II (either Math 126 or 128) are welcome to enroll as well. It serves as a kind of "transition" from computational courses (such as calculus) to theory courses (such as abstract algebra and elementary real analysis). Students initially use both the computer and paper and pencil to generate examples and calculations in various topics, then conjecture theorems based on the

patterns they see. Topics include number theory, real analysis, algebra, graph theory, and topology.

If you have any questions about the course, please contact Jill Dietz (dietz@stolaf.edu).

CS 276: Programming Languages (PL)

PL surveys the fundamental concepts and features that appear in programming languages. In this course, students study these issues and get "hands-on" experience with them by simultaneously building a programming language interpreter of their own! As new features and ideas emerge, students integrate them into their growing language interpreter. Then, at the end of the term, they have the opportunity to work on a team project, such as reimplementing the language processor in a language of their choice. PL satisfies a core requirement for the new CS major, and has SD (CS 272/251) and Computer Organization (CS 274/241) as prerequisites.

For more information, e-mail Richard Allen (allen@stolaf.edu), contact Dick Brown (rab@stolaf.edu), or visit the CS web site at www.cs.stolaf.edu.

CS 315, Bioinformatics (BI)

When biologists ask questions that require computer scientists to answer, the result is bioinformatics. For example, comparing two DNA sequences calls for some interesting computer science. The inspiration goes both ways, as well: the results of CS techniques make it possible for biologists to pursue new lines of biology research that weren't possible before. CS 315 surveys the five main areas of bioinformatics. The course's prerequisite is CS 121 (or CS 125) plus additional experience in CS OR biology OR mathematics. CS 315 also counts towards the CS major, the mathematics major and the NST-B GE requirement!

Questions? Email Richard Allen (allen@stolaf.edu), contact Dick Brown (rab@stolaf.edu), or check out the CS web site at www.cs.stolaf.edu.

CS 231: Mathematical Foundations of Computing (MFC)

The recently created MFC course introduces students to the mathematics necessary for the study of computer science. This includes proving that programs correctly do what they are supposed to do, basic logic and formal reasoning, elementary combinatorics and counting, graphs and trees, and some basic probability. The prerequisite is CS 121 (or CS 125). MFC counts toward a mathematics major as well as the CS major, so it makes a great way for math or CS folks to check out the other discipline.

Contact Dick Brown (rab@stolaf.edu) for more information, or visit the CS web site at www.cs.stolaf.edu.

Apply to Research Abroad

Three St. Olaf undergraduate research scholars will have the opportunity to conduct research abroad during each of the next three summers. Students will join teams of professional researchers in real analysis at one of two host institutions—Lodz University in Poland or Selesian University in the Czech Republic. Grant funding from the National Science Foundation allows full support for the International Interns, including travel expenses, living expenses, and a \$4000 research stipend. Students will also have the opportunity to attend professional conferences upon return.

If you are interested in applying to be an International Intern, complete the following:

1. Fill out the nine-question application form on the right-hand column of the math department website (www.stolaf.edu/depts/math) or directly at www.stolaf.edu/people/humke/REU2005-2007/REUintro.html.

2. Ask three professors to write a letter in support of your application (two references must be from mathematicians).

The deadline for all materials is Nov 11, 2005.

MAA T-Shirt Design Contest

Want to have some input in what the MSCS t-shirts look like this year? Log into <http://fusion.stolaf.edu/formcreator> to take a short and simple (2 question) anonymous survey. The top two designs will be printed on t-shirts before the end of the semester. Email Phillip Schulte (schulte@stolaf.edu) with any questions.

Last Week's Problem

Find all solutions of the equation $x^y = y^x$ for real numbers $x, y > 0$.

Congratulations to Thomas McConville '09, Aaron Johansen '07 and Paul Zorn for solving this week's problem of the week!

The equation $x^y = y^x$ is certainly true if $x = y$. If $x \neq y$ then, since x and y are positive, there is a positive parameter $a \neq 1$ such that $y = ax$. Then we are trying to find solutions to the equation $x^{ax} = (ax)^x$ which gives $(x^a)^x = (ax)^x$ and since $x, a > 0$, this implies we must have $x^a = ax$. Then $x^{a-1} = a$ and since $a \neq 1$ we get $x = a^{1/(a-1)}$ and $y = a(a^{1/(a-1)}) = a^{(a/(a-1))}$. If $a = 2$, for example, we get $x = 2$ and $y = 4$ as a solution.

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