

MSCS



Mess

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

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This Week's Colloquium

Title:	Does the Data Ever Speak for Itself?: The Ongoing Religious Battle between Bayesians and Frequentists
Speaker:	Paul Alper
Time:	Tuesday, April 11, 1:30 p.m. (treats at 1:15)
Place:	SC 182

As unbelievable as it may seem at first, statisticians can be a passionate, outspoken bunch: they often disagree heatedly based on what might properly be termed "religious" reasons. This presentation will focus on an exceedingly simple example involving one parameter, a proportion in the population, in order to illustrate the theological distinctions between the followers of the Reverend Bayes and the reigning majority in the U.S., frequentists. The example will be solved in a frequentist way and then in a Bayesian manner so as to compare and contrast the answers. The presentation will conclude with a forecast of which sect will be the eventual winner of this holy war.

Dr. Alper earned his Ph. D. in EE from The University of Wisconsin, Madison, in 1962. He has been a NATO postdoctoral fellow to the Netherlands, a postdoctoral fellow in Norway,

and a Fulbright professor in Kenya. In addition, he worked for the OECD in Paris and for UNESCO in Mexico. Dr. Alper taught statistics at the University of St. Thomas and the University of Minnesota for close to three decades. He retired from UST in 1998, but still functions as the North American Correspondent for Higher Education Review, a British journal.

Problem of the Week (POW)

Are there any three digit numbers A such that $A = a! + b! + c!$ where a , b , and c are the digits?

*** 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.

Good News in the MSCS Department!

Congratulations to Martha Wallace and Paul Roback! In February, Professor Wallace was named Kenneth Bjork Distinguished Professor, one of three newly created endowed chair positions to award outstanding teachers, scholars, and servants of the St. Olaf community. Also in February, Professor Roback was awarded tenure at St. Olaf and promoted to the position of Associate Professor.

nth Annual Math Recital Rescheduled!

Should you sing, or should you dance? Should you impersonate Professor Zorn, or Professor Taylor? This year's nth annual math recital is full of enticing choices. Luckily, you do NOT have to choose between participating in the recital and attending Bob Dole's talk next Tuesday. We are moving the recital from Tuesday, April 11 to WEDNESDAY, APRIL 19 in order to accommodate those Oles who want to hear Dole. The recital will be held at 7:00 p.m. in Ytterboe Lounge, as previously planned.

And just in case you missed this announcement last week: You are all invited to attend the math recital! And to participate! Play the piano, read a poem, tell a good joke. We accept and accommodate all levels of talent. Besides, various faculty members will be providing treats. And Bob Dole will be there. Okay, that's not true. But you could impersonate Bob Dole, and it would be funny.

If you are interested in participating, please contact Master of Ceremonies Amelia Taylor (ataylor@stolaf.edu). Mark your calendars now!

Video Presentation: Mathematics in "Arcadia"

The St. Olaf Theater Department's production of "Arcadia" runs from April 7-12, but you can get one last taste of it the evening of Wednesday, April 12. In this video, Tom Stoppard, playwright of "Arcadia," and Robert Osserman, a mathematician, discuss the mathematical topics that are included in the play. The video will begin at 7:00 p.m. in SC 170.

"Crocheting Curves: Shaping the Hyperbolic Plane" Exhibit Opens at Carleton

If you enjoyed the merging of theater and mathematics in "Arcadia," you might want to head over to Carleton to check out another mixture of art and math: "Crocheting Curves: Shaping the Hyperbolic Plane" is an exhibit that combines mathematics and crocheting.

The exhibit features the work of Daina Taimina, a mathematician at Cornell University. Hyperbolic space is extremely difficult to create in physical form, and Taimina created the first exact physical model of the hyperbolic plane. Her crochet models are currently featured in the Smithsonian's collection of American Mathematical Models.

The exhibit is being held in Carleton College's Gould Library Athenaeum and runs from March 27 through June 4. It is free and open to the public.

Math 382: Topics in Analytical Mathematics

When you scroll through the class and lab schedule for next semester, make sure you scroll ALL the way to the bottom. Otherwise you might miss a new course being offered by Jill Dietz this fall—Math 382: Topics in Analytical Mathematics.

There is no real topic for this "topics" course. Rather, students will learn research methods and work on research projects in mathematics. Professor Dietz will suggest projects from group theory, number theory, graph theory and other subjects, and students will do the research in pairs. The entire class will meet one day a week to learn about research methods and report on team progress, and each team will

meet independently with Professor Dietz one hour per week.

This is a rare and exciting opportunity to do research during the academic year. The course is open to anyone who has taken either ERA or Abstract Algebra.

Last Week's Problem

True or False: Every cubic polynomial agrees with its derivative at some point; that is, there exists a real number c so that $f(c) = f'(c)$. Either give an explanation or a counterexample.

Challenge POW: True or False: Every polynomial with a real root agrees with its derivative at some point.

Congratulations to Tyson Reed '07 for submitting a solution. What follows is essentially Tyson's solution:

Let $f(x) = Ax^3 + Bx^2 + Cx + D$, where A is a real number which cannot equal zero and B , C , and D are real numbers. Then $f'(x) = 3Ax^2 + 2Bx + C$. Thus $f(x) - f'(x) = Ax^3 + (B - 3A)x^2 + (C - 2B)x + (D - C)$. For any A , B , C , D , there exists a large positive x value, say $a \gg 0$ such that $f(a) - f'(a) > 0$ and there exists a very large negative x value, say $b \ll 0$ such that $f(b) - f'(b) < 0$. Thus, by the Intermediate Value Theorem, there exists a c between b and a such that $f(c) - f'(c) = 0$, which implies $f(c) = f'(c)$.

An alternate argument uses the fundamental theorem of algebra. Note that $f(x) - f'(x)$ is again a cubic polynomial since A is not 0 and the coefficients are all real. Then $f(x) - f'(x)$ must have three roots (not necessarily distinct) and at most two of them can be complex roots. Thus, there must exist a real number c such that $f(c) - f'(c) = 0$, which implies $f(c) = f'(c)$.

The challenge POW can be done using an IVT theorem argument similar to that above, but it is more subtle to establish that the fact that the polynomial has a real root implies there exists an a such that $f(a) - f'(a) < 0$ and that there exists a b such that $f(b) - f'(b) > 0$.

Federated Insurance Leadership Scholarships

A notice from the CEL...

Federated Insurance, Owatonna, MN has made a gift to St. Olaf College that will allow the awarding of two \$1,000 scholarships for the academic year 2006-07.

To be eligible to apply for this scholarship, a student must currently be a junior (class of '07) with a declared major in math or economics or a concentration in management studies, and a GPA of at least 3.0.

As an organization that prides itself on equity, teamwork, integrity and respect, Federated Insurance will expect that students who apply can demonstrate their commitment to these "cornerstone" principles. Federated Insurance has a long history of community leadership and service to others and, as such, students applying for these scholarships should demonstrate a similar orientation.

The application deadline is April 10th. To apply for one of the Federated Insurance Leadership Scholarships, see details on the OleRecruiting website (www.stolaf.edu/services/career).

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