

MSCS



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

October 8, 2004
Volume 33, No. 4

This Week's Colloquium

Title: Confidence Interval Calculations for an Innovative Clinical Trial Design
Speaker: Alfred Furth '98
Time: Tuesday, October 12, 1:30 pm
(treats at 1:15)
Place: SC 182

Clinical Trials are an important part of cancer research. They are used to test whether or not a given treatment or drug regimen is effective and safe. There are three phases of clinical trials: dose finding (phase I), screening (phase II) and efficacy (phase III). I will focus on phase II clinical trials in this talk. The typical phase II clinical trial for cancer has a binary endpoint, such as (tumor) response. At the end of phase II clinical trials, confidence intervals for the true response rate are calculated and reported. While confidence intervals for binary data are generally straightforward, for most Phase II clinical trials the computation of the response rate confidence intervals are tricky due to the methods of patient accrual.

Sargent et al. (2001) proposed a Phase II three-outcome clinical trial design that allows for a third "uncertain" outcome. However, it was unclear as to how confidence intervals would be computed in this new design.

In this talk I plan to discuss my approach to the problem by outlining the framework of a typical phase II clinical trial design, briefly describing the confidence interval computation algorithm, comparing and contrasting the two-outcome design with the three-outcome design, and providing graphical results of computer simulations that provide strong evidence that the accepted method of calculating confidence intervals for two-outcome designs are appropriate for the three-outcome design.

Get Ready for the Carlson Contest

Short on cash? This year's Carlson Contest will be Wednesday and Thursday, October 13 and 14. There are cash prizes at three levels: upper-class, first-year, and Calc I students.

Problems can be picked up in the area just down the steps from SC 188 any time between 2 and 6 pm on Wednesday or between 6 and 10 pm on Thursday. Teams will have 2 hours to do the problems and return their solutions. Talk to your friends and form a team (up to 3 people - your group will compete in the category of the most advanced member of your team). Get ready to solve some problems!

Send any questions to Amelia Taylor at ataylor@stolaf.edu with the subject line "carlson contest".

New Statistics Concentration

Many of you may have noticed that there have been some revisions to the Statistics Concentration. The new concentration was designed to be flexible enough to embrace students with an interest in exploring statistics whether they are pursuing a degree in mathematics or some other discipline. Like the past, the concentration consists of a four courses. The major change is that the core courses in the concentration are now Statistical Modeling (Statistics 272) and Advanced Statistical Modeling (Statistics 316). This sequence introduces students to modeling and applications through case studies and will serve students well in future study in nearly any discipline. Nonetheless with the new concentration, mathematically inclined students can get a rigorous introduction to fundamental concepts in statistics in much the same way they have done previously by complimenting the core courses with Probability Theory (Math 262) and Statistical Theory (Stat 322). Students whose interests are more in the applied realm and who are quantitatively capable, but not necessarily majoring in mathematics can select their electives from research methods courses in specific disciplines as well as other statistics offerings such as Experimental Design and Biostatistics. Statistics combines nicely with many different majors. If you are interested in pursuing statistics in graduate school, you will find plenty of opportunities for fellowships which will cover the cost of your education. As a field, statisticians are in high demand and can work in a wide variety of settings.

Summary of Requirements: 4 courses; 2 required foundation courses in statistical modeling with prerequisites of Calc I and Introductory Statistics, and 2 electives. We recommend, but do not require, students participate in an experiential learning opportunity and enroll in QWAC modules for courses they are taking when available.

For additional information about the new statistics concentration and details about individual classes, visit

<http://www.stolaf.edu/catalog/academicprogram/statistics.html>

Problem of the Week

Can the numbers from 1 to 25 be partitioned into two or more subsets so that the product of the numbers in each subset is the same?

I discovered last week, that I enjoy getting solutions, so we'll slowly increase the level of difficulty, but not send it through the roof yet. If you want to up the challenge on this one, after you get the answer for 25, try to answer the question for the set of numbers from 1 to n for any positive integer n .

*** 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.

Last Week's Problem

In a cross-country run, Sven placed exactly in the middle among all participants. Ole placed lower, in tenth place, and Lena placed sixteenth. Is it possible to figure out how many runners took part in the race?

Great News! There was a flurry of solutions this week. Congratulations to **Joe Anderson '07, Nolan Cook '08, Steven Engle '07, Matthias Hunt '07, Carrie Manke '06, Robert Orme '05, David Swanson '08, Kristine Thomsen '06, and William Voorhees '07**, for their solutions.

Since Sven placed exactly in the middle, there must be an odd number of participants. If Lena got 16th, then there must be at least 17 runners. Since Ole placed lower than Sven at 10th place, 17 is the maximum also and Sven was in 9th place

New Faculty Spotlight: Nicole Hoft



Nicole recently received her Ph.D. in Statistical Genetics from the University of Minnesota. With an M.S. in Mathematical Biology from University of California, Davis, Nicole's research interest use mathematical and statistical concepts to explore biological questions and include: gene and QTL mapping, cell locomotion, stochastic differential equations, and statistical modeling. When she is not teaching or doing research Nicole can usually be found hiking or running in the woods and mountains. A novice wake-boarder, she also spends time on Minnesota's numerous lakes.

Career Opportunities

Federated Insurance: On Monday, October 11, from 6:30 to 7:30 p.m. in Buntrock 142, representatives from Federated Insurance will discuss career opportunities such as: Associate Actuarial Analyst, Business Application Programmer, and Underwriter – Commercial Accounts Analyst.

Minnesota Life Insurance Company: On Tuesday, October 12, from 7-8 p.m. in Buntrock 144, representatives from Minnesota Life will discuss opportunities with them. Opportunities available include Actuarial Intern, Assistant Actuarial Analyst, Programmer Intern, and Programmer Analyst.

For additional information about these information sessions, please consult the bulletins by the math office.

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