MSCS ⬡ Mess

This Week's Colloquium

> Title: Using Video to Understand Transpiration
> Speaker: Aaron Luttman
> Date: Tuesday April 15th
> Time: 1:30pm (Treats 1:15)
> Location: SC 188

Abstract: In order to engage in photosynthesis, plant leaves absorb carbon dioxide through the opening of pores in their surfaces called "stomata." Water evaporates through open stomata, however, this is bad for the plant. Thus a plant tries to adjust its stomata so that it balances its need take in CO_2 with its aversion to losing H_2O. In order to visualize the extent to which these pores are open, we use a camera to measure infrared fluorescence that corresponds to how much CO_2 is being absorbed. In these pictures of the leaf, bright regions correspond to areas in which the stomata are closed and dark regions to areas in which the stomata are open. Pictures are continually recorded as these patterns change with time, and the result is a "movie" that must be processed mathematically in order to analyze the bright and dark regions. We use partial differential equations and large computers to figure out how the bright regions evolve over time, and this information tells us (hopefully!) how a leaf adjusts its stomata. Understanding this process leads to better insight into the biological process involved, which is not currently understood in its entirety. Results for an actual leaf and basic analysis of the patterns will be presented.

Carlson Problem Solving Contest

It's time for the annual Carlson Problem Solving Contest. You can win the largest cash prize ever awarded!

Format: The exam is an individual 75 minute exam that is taken at St. Olaf on the honor system. The exam may be picked up beginning Apr. 10 **(NOW!)** outside Old Music 304 and must be completed by Monday, Apr. 14. If you plan to take the exam, please inform Prof. Smith in Old Music 209, or Prof. Weimer in Old Music 304, or send an e-mail to weimer@stolaf.edu.

Prize Format: There are two categories, first year students in one category, upper-class in the other. Prize money will be awarded in each category as follows:

First Place = $60
Second Place = $50
Third Place = $40
Fourth Place = $30
Fifth Place = $20
Sixth Place = $10

Putnam Contest Results

Eight St. Olaf students took part in the 68th Annual William Lowell Putnam Mathematical Competition, held Dec. 1, 2007. Thomas McConville scored 25, placing him in the top 8% nationally. Christina Koch scored 20, Nathan Clement 12, and Bjorn Paulson 10. Fewer than one-third of the contestants nationally scored 10 or better.

As an institution, St. Olaf ranked 126th of 516.

Solution to Problem of the Week

Each of the letters {D,E,M,N,O,R,S,Y} is to be replaced with a base-10 digit {0,1,2,3,4,5,6,7,8,9} to make the following addition correct.

$$SEND + MORE = MONEY$$

Solution submitted by Ben Thompson:
For the letters {D,E,M,N,O,R,S,Y} The solution is {7,5,1,6,0,8,9,2}.
So 9567 +1085 = 10652.

Since S,M < 10, Then M must be 1. It follows that S must be 8 or 9. By guess and check, S must be 9. It follows that the letter O is 0. Then E+1=N because E cannot equal N. From this information, we can deduce that R=8 and also that D+E > 10. After a little guess and check, we find that E,N, and D are the numbers 5,6 and 7. It follows that Y=2.

If you allow the leading letters (M or S) to be zero, then Anna Legard proposes another solution:

The set of letters {D,E,M,N,O,R,S,Y} correspond to the set {1,7,0,3,6,4,5,8} so that SEND + MORE = 5731 + 647 = 6378 = MONEY (omitting the zeros for the M's).

Problem of the Week:

Computer Science Problem of the Week:
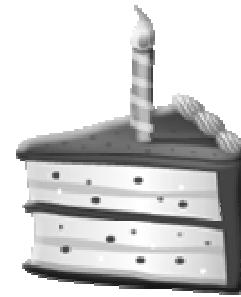
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      S N T
    x  O L A F
  C O L L E G E
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Write a program that specifies all solutions (if any) to the above multiplication, so that there is a bijection from the letters {A,C,E,F,G,L,N,O,S,T} to the digits {0,1,2,3,4,5,6,7,8,9}.

Joke of the week
-Submitted by Will Voorhees
The birthday study

It is proven that the celebration of birthdays is healthy. Statistics show that those people who celebrate the most birthdays become the oldest. -- S. den Hartog, Ph D. Thesis Universtity of Groningen.