

WSE187: Introduction to Research, Spring 2009

Project Title: Using Math and Algorithms to Solve Some Everyday Problems

Instructor: Joe Mitchell, Math Tower 1-109, 632-8366, jsbm@ams.sunysb.edu

Office hours (tentative): Mon (12:00-1:00), Tues (12:30-2:00), or by appointment, or whenever you drop by and I am free (don't be shy!)

Course Web Site: <http://www.ams.sunysb.edu/~jsbm/courses/187/wse187.html>

Meeting time/place: Tue/Thur 3:50-5:10 in Math Tower 1-122A, Jan 29 – Feb 24, 2009

Prerequisites: None.

Overview of the Project: Algorithms are precise recipes to solve problems. Algorithms are everywhere in our lives these days. Many everyday problems are solved using mathematical algorithms. We will explore several such problems, particularly those that are easy to visualize because they have a "geometric" component to them:

1. How do I find a shortest/quickest route to drive to my destination?
2. What is the best order in which to run my errands, to minimize travel?
3. Where do I place sprinkler heads in my lawn to get good coverage?
4. How should I mow my lawn to minimize the amount of walking I do?
5. Where should I place security cameras/sensors in my house to guarantee coverage, while minimizing the cost (number of sensors)?

We will discuss these and other algorithmic problems, introducing some basic concepts that come from applied mathematics. Students will be expected to explore other practical everyday problems to which algorithmic thinking can be applied.

Requirements: You are expected to attend and participate in discussions. In addition, each student is expected to identify a specific problem area in everyday life for which math and algorithms can be applied. In a brief report, or, ideally, a web page, you should assemble information about the problem, references to how it has been modeled and studied algorithmically, and links (urls) to information, applets, references on the subject.

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<http://www.stonybrook.edu/uaa/academicjudiciary/>.

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