Project Year

2002

Project Team

Faculty: Paul Maiste, Applied Mathematics and Statistics, Whiting School of Engineering
Fellow: Charalambos Antoniou, Computer Science, Whiting School of Engineering

Project Title

Creating a Hands-On Data Analysis Environment

Audience

Students enrolled in the two-semester *Data Analysis* course.

Pedagogical Issue

The statistical analysis of experimental data is as much an art as it is a science. Only through extensive experience does one develop the skills to successfully analyze and model experimental phenomena. A one-semester course, such as *Data Analysis*, is limited in its ability to impart such experience. Current lecture examples are limited to overheads of simple graphics and other computer output. The amount of time necessary to discuss both methodology and application in the lecture setting limits the exposure students receive to the potential variety of problems. Finally, computer analysis is important for such a course, yet lab time is sparse and is necessarily overloaded with mundane, cookbook, how-to material instead of real, hands-on applications.

Solution

In this project, this team proposes to enhance the *Data Analysis* course by developing three to five case studies based on real experimental data. These will be developed using S-PLUS, a powerful statistical analysis and graphics package. We intend to make two or three of these studies available online, along with three-dimensional interactive graphics. The studies will be fully developed, and will span a wide range of topics in data analysis and statistical modeling. A course-specific guide for using S-PLUS will also be developed. We will also work within S-PLUS to create some customized functions that will allow students to get much more out of this software. Finally, some pre-existing website resources will be consolidated; we will compile a list of links to Internet resources for data analysis, case studies, and data sets. These new resources will improve students' access to the real-world issues involved in data analysis, and give them the necessary tools to learn how to use statistical analysis packages. As a result of this project, class time will be spent more efficiently, and distributed over a greater variety of applications.

Technologies Used

S-PLUS, Web Development