Undergraduate Colloquium Series

My experience at the
2006 Joint Statistical Meetings

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Juan Hu is a master's student majoring in statistics, due to graduate in May 2007. Last year, she went to the Joint Statistical Meetings in Seattle with Dr. Ali and Dr. Umbach, which turned out to be a very exciting and interesting experience. After graduation, she will pursue a Ph.D. in statistics at Purdue University.

A brief introduction to JSM

Recently, I got a chance to attend the 2006 Joint Statistical Meetings (JSM) in Seattle. I was so excited to meet so many statisticians and students studying in the field of statistics. For the first time, I felt the power of statistics in almost every aspect of human life from science to technology, from education to agriculture. JSM is the largest conference for statistics in North America. It is held jointly with the American Statistical Association (ASA), the Institute of Mathematical Statistics (IMS), and the Statistical Society of Canada (SSC). This year, more than 5000 people attended the meeting. It is a very good place to meet people in the field, to learn about current topics in statistics, and to see the most famous statisticians in North America.

JSM includes various sections for attendants—oral presentations, panel sessions, continuing education courses, career placement services, and the exhibition hall. Everyone in statistics including statisticians, new students in statistics like me, students who are trying to find a job in statistics, researchers, and professors, can find much useful information.

Oral presentation

In the oral presentation section, the presenters are divided into different groups according to their topics. They share their research ideas or achievements with the audiences. For researchers, the advantage of these groups is that it is very easy to find topics in which they are interested. Moreover, they can share ideas with other researchers working in the same areas. For those who are planning to get higher degrees in statistics, to attend some introductory sections can provide valuable information about current issues in various fields of application. One of the hottest such fields in statistics is biostatistics, among which the notion of clinical trials is a very big issue. For example, during clinical trials, how can we control the different types of variance? In order to get more precise and reasonable results, people will change the sample size and the design method of the trial in the middle of the clinical trial.

Another important issue in the field of data mining is the Random Forest. The idea of the Random Forest is based on a decision tree. If we build the decision tree by using different properties, and combine them randomly with controlled variables, then a random forest is set up. Leo Breiman gave the definition of *random forest*: "Each tree gives a classification, and we say the tree 'votes' for that class. The forest chooses the classification having the most votes (over all the trees in the forest)" [1]. In this way, it produces a highly accurate classifier.

The exhibition hall

The exhibition hall is filled with booths representing various companies and federal departments with applications in statistics. During my trip through the exhibition hall, I was so excited to see that statistics played such an important role in so many fields. I talked with many people and tried to understand how statistics can be used in different fields.

Application in biology

Statistics has become so important in biology that biostatistics is now an independent department in many universities. Pharmaceutics and therapeutics are two important branches of biostatistics. In pharmaceutics, people design experiments to check if a new medicine is safe enough or how the medicine will affect related diseases. In therapeutics, people use clinical trials to determine the risk factors for diseases. The techniques are beneficial to research in oncology, genetics, and pediatrics. For different diseases, the data set are different, so different analysis methods should be considered. For example, survival analysis is used in oncology. In pediatrics, statisticians must choose analysis methods that deal with rare data sets.

Application in other fields

Statistics is also very useful in fields such as insurance, engineering, finance, marketing and economics. Insurance companies use statistics with pension plans, risk assessment, etc. Engineers use statistical models to control the quality of products, control pollution and cost. Statistics plays a large role in this field. Financial statisticians build models to help organizations or companies make predictions to avoid risk and exploit opportunities. In marketing, statisticians may design experiments for new products and help make decisions about how to improve sales and how to get more customers.

Conclusion

During the conference, I spent most of the time in the exhibition hall and listening to the presentations. In these two sections, I got much valuable information. The organizing committee of the conference also provided several social activities such as student mixers in which students in statistics could get together to know each other, and a dance party for people to make friends. It was really an impressive experience at JSM.

References

[1] L. Breiman and A. Cutler, *Random Forests* (December 19, 2006) ⟨stat-www.berkeley.edu/users/breiman/RandomForests/cc_home.htm⟩.