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**Colorado State University's
Information Science and Technology Center (ISTeC)
presents two lectures by**



Dr. Steve Marron

Amos Hawley Professor of Statistics and
Operations Research
University of North Carolina

**ISTeC Distinguished Lecture
in conjunction with the
Electrical and Computer Engineering Department and
Computer Science Department Seminar Series**

"Object Oriented Data Analysis"

Monday, March 5, 2012

Reception: 10:30 a.m.

Lecture: 11:00 – 12:00 noon

Location: Lory Student Center, Room 205



Department of Statistics Lecture

sponsored by ISTeC

**"Object Oriented Data Analysis of
Tree-Structured Data Objects"**

Monday, March 5, 2012

Reception: 3:30 p.m., Statistics Building Room 213

Lecture: 4:00 p.m., Weber Building Room 223

ABSTRACTS

“Object Oriented Data Analysis”

Object Oriented Data Analysis is the statistical analysis of populations of complex objects. In the special case of Functional Data Analysis, these data objects are curves, where standard Euclidean approaches, such as principal components analysis, have been very successful. Recent developments in medical image analysis motivate the statistical analysis of populations of more complex data objects which are elements of mildly non-Euclidean spaces, such as Lie Groups and Symmetric Spaces, or of strongly non-Euclidean spaces, such as spaces of tree-structured data objects. These new contexts for Object Oriented Data Analysis create several potentially large new interfaces between mathematics and statistics. Even in situations where Euclidean analysis makes sense, there are statistical challenges because of the High Dimension Low Sample Size problem, which motivates a new type of asymptotics leading to non-standard mathematical statistics.

“Object Oriented Data Analysis of Tree-Structured Data Objects”

The field of Object Oriented Data Analysis has made a lot of progress on the statistical analysis of the variation in populations of complex objects. A particularly challenging example of this type is populations of tree-structured objects. Deep challenges arise, which involve a marriage of ideas from statistics, geometry, and numerical analysis, because the space of trees is strongly non-Euclidean in nature. These challenges, together with three completely different approaches to addressing them, are illustrated using a real data example, where each data point is the tree of blood arteries in one person's brain.

SPEAKER BIOGRAPHY

J. S. Marron (<http://www.unc.edu/~marron/marron.html>) is the Amos Hawley Distinguished Professor of Statistics and Operations Research, at the University of North Carolina, Chapel Hill. He received the B. S. degree from the University of California at Davis, and the Ph. D. from the University of California at Los Angeles. Marron has held the positions of Assistant, Associate and Full Professor with the University of North Carolina, Chapel Hill, and is also Adjunct Professor of Computer Science and Member of the Lineberger Comprehensive Cancer Center. He has also served as Mary Upson Distinguished Professor of Operations Research at Cornell University, and held 13 other visiting positions in four countries. Marron is an elected Fellow of the American Statistical Institute and the Institute for Mathematical Statistics, and an elected Member of the International Statistical Institute. Marron has served as Associate Editor for the Annals of Statistics, the Journal of the American Statistical Association, the Journal of Nonparametric Statistics, Computational Statistics and Test. He is the Chair Elect of the Nonparametric Statistics Section of the American Statistical Association. Marron has presented the Theory and Methods Invited Paper for the Journal of the American Statistical Association, been the Institute of Mathematical Statistics Medallion Lecturer, and presented the S. N. Roy Memorial Lecture at the University of Calcutta.

To arrange a meeting with the speaker, please contact Prof. Haonan Wang at wanghn@stat.colostate.edu or (970)491-2449.

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