

The University of Chicago
Department of Statistics

Seminar

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“Directional Data Analysis - Models, Inference and Applications”

Monday, June 17, 2002 at 11:00 AM
110 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

Data relating to angular displacements, directional propagations, circular orientations, etc. may be termed as directional data (DD). Periodic data may also be cast in this framework - data on circadian rhythms in chrono=biological studies is one such example. Such data appear often in Agricultural, Biological, Defence, Environmental, Meteorological, Medical - almost all areas of Applied Sciences. A general family of wrapped stable mixture distributions will be enhanced for unimodal symmetric circular data. A family of asymmetric circular distributions will then be presented. Note that statistical inference procedures known for the usual (linear) data are often not applicable and can be grossly misleading when applied to DD - e.g., here the sample mean and variance are nonsensical measures. Preliminary estimation and testing procedures will be first presented. Some special topics such as robust optimal tests for isotropy, asymmetry and change-point in the presence of general nuisance parameters, cylindrical regression and independence on the torus will then be discussed. The results will be illustrated through real life examples which have been analyzed using DDSTAP, a STATistical Package for Directional Data, developed recently by this speaker.

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