Wiener Biometrische Sektion
der Internationalen Biometrischen Gesellschaft
Region Österreich – Schweiz

Einladung zum

Biometrischen Kolloquium

am Mittwoch, dem 12. Juni 2002, 16:00 Uhr

im Seminarraum des
Instituts für Medizinische Statistik
Schwarzspanierstr.17 (Gebäude der Physiologie, 3. Stock)
Tel. 4277 63201
A-1090 Wien

Es spricht Herr Dr. Alexander Ploner, Universitätsassistent am Institut für Mathematik und Angewandte Statistik der Universität für Bodenkultur, zum Thema:

Modellieren von Besucherzahlen mit Regressionsbäumen

Thomas Waldhör   Karl Moder
Präsident   Sekretär

Abstract:

Day to day changes of the visitor load in recreation areas are heavily dependent on the weather. We propose using regression trees as a flexible and intuitive tool for modelling this relationship. The suitability of the approach is demonstrated for video monitoring data from the Lobau, an Austrian nature conservation area.

It has been shown that the number of visitors to the Lobau can be predicted with good results by using a mixture of meteorological variables and derived comfort indices, especially the Physiological Equivalent Temperature (PET). These predictions were based on linear regression models for the logarithmised visitor numbers.

Regression trees are an attractive alternative for prediction because they handle nonlinearity and interactions between variables implicitly. Additionally, they offer a hierarchy of importance of the predictors involved, a classification of the data based on both predictors and the predicted variable, and an intuitive graphical representation of the model.

When applied to the Lobau data, the regression trees confirm our earlier results, e.g. the importance of PET, the necessary distinction between workdays and holidays, and higher predictability of large user groups like hikers or cyclists when compared to less numerous groups like joggers or dog owners. Additionally, the tree models show interactions between the PET and the meteorological variables that were absent from the linear models, and they allow us to identify typical weather/visitor scenarios. Furthermore, the trees can be interpreted as a model for the way in which potential visitors base their decision to visit a recreation area on the current weather situation.

Cross validation shows that for predictive power, tree models are competetive with linear models. For future applications in the context of a short-term prognostic managemenat system, we expect tree models to be less sensitive towards meteorological prediction errors.