

**Wiener Biometrische Sektion
der Internationalen Biometrischen Gesellschaft
Region Österreich – Schweiz**

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Einladung zum

Biometrischen Kolloquium

am Freitag, dem 29. Juli 2005, 11:00 Uhr s.t.

in der Bibliothek (Ebene 3, gegenüber Lift) des MSI
(Besondere Einrichtung für Medizinische Statistik und Informatik)
der Medizinischen Universität Wien
Spitalgasse 23, 1090 Wien

Es spricht Frau Dr. Carina Ittrich von der Abteilung für Biostatistik
des Deutschen Krebsforschungszentrums Heidelberg zum Thema:

Penalized Maximum Likelihood Regression

Wir ersuchen um zahlreichen Besuch für diesen sehr interessanten
und aktuellen Vortrag.

Karl Moder
Präsident

Werner Brannath
Sekretär

Penalized maximum likelihood regression

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Maximum likelihood regression is a general technique for estimating parameters and drawing statistical inferences in a variety of situations. New biomolecular techniques provide information on thousands of variables simultaneously and hence lead to situations where the number of predictors greatly exceeds the number of observations ($p \gg n$). In these models conventional ML regression produce unsatisfactory results. Therefore variable selection is fundamental to high-dimensional statistical modelling. Penalized likelihood approaches are proposed to handle these kinds of problems. The algorithm developed by Fan & Li (2001, 2002) is adapted for optimizing penalized likelihood functions for logistic and Cox proportional hazards regression in situations where $p \gg n$. The proposed method using the smoothly clipped absolute deviation (SCAD) penalty selects variables and estimates coefficients simultaneously. We describe the development of the model and the steps in the implementation, including a fast computational formula based on singular value decomposition (cp. Eilers et al., 2001). Finally, we illustrate the methodology for classification and survival analysis using a data set for patients with acute myeloid leukemia.

References

Eilers P, Boer J, van Ommen G and van Houwelingen H (2001): Classification of Microarray Data with Penalized Logistic Regression. Proceedings of SPIE, 4266, 187–198.

Fan J and Li R (2001): Variable Selection via Nonconcave Penalized Likelihood and its Oracle Properties. J. Amer. Statist. Assoc., 96, 1348–1360.

Fan J and Li R (2002): Variable Selection for Cox's Proportional Hazards Model and Frailty Model. The Annals of Statistics, 30, 74-99.