Projects StatsLab Spring 2013

Project	Title (Language)	Description	Statistical Method	Client Name (DO NOT	Student Name	Supervisor
1	**Missing values**	Datasets of longitudinal studies of patients in a clinical settings are typically affected by missing data. It is known that missing data may result from different underlying mechanisms. The identification of the missing mechanism is the first step in the correct handling of missing data. In this project, the student will work on an real-world set of clinical data. The goals are to identify the missing mechanism and to propose appropriate strategies to handle them. (Together with Hospital Balgrist)	Missing values			
2	**Spatial structure**	Many clinical studies collect data from different parts of the human body. This data is usually aggregated to a total score to allow further analysis. During data aggregation, the spatial information is lost. This loss of information should be prevented, since it reflect the underlying function/structure of the human body. In this project, the student will work on an real-world set of clinical data. The goal is to propose innovative and efficient ways to analyze this kind of data. (Together with Hospital Balgrist)	Multivariate Stats			
3	**Biomechanical Parameters for risk of Cystoceles**	Biomechanical parameters of the vagina of different groups of women were recorded. The goal is to detect any association between a certain medical issue (cystoceles) and biomechanical parameters. (Together with Institute of Mechanical Systems, ETH)	ANOVA / GLM			
4	**Life Expectancy Prediction**	**Life expectancy has increased to some extent due to improved health care. The city of Zurich government knows past mortality rates but is interested in predictions of future mortality. Until now, a parsimonious non-parametric model has been applied. Parametric mortality models (Gompertz, Makeham, Lee-Carter, Heligman-Pollard) have not been evaluated with Zurich data; this is the objective of this project. Specifically, temporal changes of the model parameters (often modeled with ARIMA models; e.g. for Lee-Carter and Heligman-Pollard) should be assessed. (Together with Stadt Zürich)**	Mortality Models			
5	**Groups with Increased Mortality Risk**	In general, woman have lower mortality rates and consequently increased life expectancy compared to men. However, are there further groups with different mortality rates in the city of Zurich? E.g. are there certain nationalities, age and profession groups or districts with increased mortality rate? (Together with Stadt Zürich)	GLM			
6	**Influence of Heat and Cold on Mortality**	In general, mortality rates have decreased in the city of Zurich over the last twenty years. However, in the heat year 2003, increased mortality could be observed compared to more moderate temperature in previous and following years. This study should assess the influence of temperature on mortality in the city of Zurich. (Together with Stadt Zürich)	GLM			
7	**Number of beetles**	The number of beetles in traps should be explained by some given factors. (Together with WSL)	GLM			
8	**Quality of skin transplant**	When operating the hand of small children, it is common that skin needs to be transplanted. A new method of transplantation was introduced; the goal is to compare the quality of the transplantation of the new and old method (Together with Kinderspital Zürich).	LM / GLM			