Stellingen

behorende bij het proefschrift "Complex Data Modelling Using Likelihood and H-likelihood Methods" van Marek Molas.

1. H-likelihood is not sufficient for the estimation of all the parameters in the model, however it is a tool to construct valid adjusted profile likelihoods.

2. Maximizing the joint likelihood gives the same estimates of the random effects as the mode of the empirical Bayes posterior distribution given the same plug in values of fixed effects and variance components are used in both methods.

3. Transformation of the response might be required to satisfy the distributional assumptions, however after a transformation the inference might not answer the original question at hand.

4. Subgroup analysis or multiple endpoint analysis can be performed by more complex model encompassing all the groups or endpoints. This model can allow more complex relations between endpoints as well as groups.

5. Simulation techniques are useful in likelihood-based statistics, while it is not known how to perform simulations for quasi-likelihood, where no probabilistic distribution might exist.

6. Mixtures of exponential family distributions can be estimated by interchangeable Iterated Weighted Least Squares if number of components of the mixture is fixed, this allows easy inclusion of covariates in the mean and dispersion structure of the individual components (this thesis).

7. In order to approximate the distributional assumptions for Bounded Outcome Scores (BOS) a logistic transformation might be used further augmented with coarsening mechanism (this thesis).

8. The package HGLMMM can be used to estimate repeated measures models with independent random effects using h-likelihood algorithms and is freely available together with source codes on internet (this thesis).

9. The truncated Poisson distribution can be expressed as an exponential family distribution, therefore theory of (H)GLMs applies to it (this thesis).

10. The Newton-Raphson algorithm can be blended with h-likelihood techniques to allow for the introduction of correlation parameters between random effects, and being a basis for various further improvements of the h-likelihood capabilities (this thesis).

11. All music is beautiful (Billy Strayhorn).