0.1 Efficient Updating Theorem

Zewotir and Galpin (2005) describes the basic theorem of efficient updating.

-

$$m_i = \frac{1}{c_{ii}}$$

0.2 Zewotir Measures of Influence in LME Models

Zewotir and Galpin (2005) describes a number of approaches to model diagnostics, investigating each of the following;

- Variance components

- Fixed effects parameters

- Prediction of the response variable and of random effects

- likelihood function

Chapter 1

Zewotir's Paper

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1.2.1 Cook's Distance

- For variance components γ: $CD(\gamma)_i$,

- For fixed effect parameters β: $CD(\beta)_i$,

- For random effect parameters $\boldsymbol{u}$: $CD(u)_i$,

- For linear functions of $\hat{beta}$: $CD(\psi)_i$

Random Effects

A large value for $CD(u)_i$ indicates that the $i-$th observation is influential in predicting random effects.

linear functions

$CD(\psi)_i$ does not have to be calculated unless $CD(\beta)_i$ is large.

1.2.2   Information Ratio

1.3 Computation and Notation

with $\boldsymbol{V}$ unknown, a standard practice for estimating $\boldsymbol{X\beta}$ is the estime the variance components σ_j^2, compute an estimate for $\boldsymbol{V}$ and then compute the projector matrix A, $\boldsymbol{X\hat{\beta}} = \boldsymbol{AY}$.

? remarks that $\boldsymbol{D}$ is a block diagonal with the $i-$th block being $u\boldsymbol{I}$

1.4 Haslett's Analysis

For fixed effect linear models with correlated error structure Haslett (1999) showed that the effects on the fixed effects estimate of deleting each observation in turn could be cheaply computed from the fixed effects model predicted residuals.

A general theory is presented for residuals from the general linear model with correlated errors. It is demonstrated that there are two fundamental types of residual associated with this model, referred to here as the marginal and the conditional residual.

These measure respectively the distance to the global aspects of the model as represented by the expected value and the local aspects as represented by the conditional expected value.

These residuals may be multivariate.

Haslett and Hayes (1998) developes some important dualities which have simple implications for diagnostics.

1.5 Demidenko's I Influence

The concept of I Influence is generalized to the non linea regression model.

Chapter 2

Zewotir's Paper

2.1 Efficient Updating Theorem

Zewotir and Galpin (2005) describes the basic theorem of efficient updating.

-

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2.4 Measures 2

2.4.1 Cook's Distance

- For variance components γ

Diagnostic tool for variance components

$$C_{\theta i} = ((\hat{\theta})_{[i]} - \hat{(\theta)})^T \text{cov}(\hat{(\theta)})^{-1} ((\hat{\theta})_{[i]} - \hat{(\theta)})$$

2.4.2 Variance Ratio

- For fixed effect parameters β.

2.4.3 Cook-Weisberg statistic

- For fixed effect parameters β.

2.4.4 Andrews-Pregibon statistic

- For fixed effect parameters β.

The Andrews-Pregibon statistic AP_i is a measure of influence based on the volume of the confidence ellipsoid. The larger this statistic is for observation i, the stronger the influence that observation will have on the model fit.

2.5 Haslett's Analysis

For fixed effect linear models with correlated error structure Haslett (1999) showed that the effects on the fixed effects estimate of deleting each observation in turn could be cheaply computed from the fixed effects model predicted residuals.

Chapter 3

Zewotir's Paper

3.1 Efficient Updating Theorem

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-

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Bibliography

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