Lecture Notes in Statistics

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Generalized Linear Models
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The updated estimates (\( \hat{\beta} \), \( \hat{\delta} \)) are obtained at the linear model

\[
\hat{\beta} = \frac{e}{\hat{\delta}}, \quad \hat{\delta} = \frac{d}{\hat{\beta}}
\]

Decisions are made with respect to the linear predictor. We also consider the non-linear estimation.

In the case of a generalized linear model, \( \hat{\beta} \) and \( \hat{\delta} \) can be expressed as

\[
\begin{align*}
\frac{\hat{\delta}}{\hat{\beta}} &= \frac{\theta_1}{\theta_2} = n \\
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\end{align*}
\]

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\[
\frac{\theta_1}{\theta_2} = \frac{\hat{\delta}}{\hat{\beta}} = n
\]

The linear models are expressed at the linear model.

The non-linear models are expressed at the linear model.

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\[
\text{(11)} \quad (S-DV)_{\alpha} + (S-DV)_{\beta} = (S-DV)_{\gamma}
\]

Combining the two previous equations, we get:
\[
\text{(12)} \quad (S-DV)_{\alpha} + (S-DV)_{\beta} = (S-DV)_{\gamma}
\]

From this, we can conclude:
\[
\text{(13)} \quad (S-DV)_{\alpha} = (S-DV)_{\beta} = (S-DV)_{\gamma}
\]

Simultaneously solving the above equations leads to the equations:
\[
\text{(14)} \quad \begin{cases}
S_{\alpha} = S_{\beta} = S_{\gamma} \\
D_{\alpha} = D_{\beta} = D_{\gamma}
\end{cases}
\]

In the context of the above equations, we observe:
\[
\text{(15)} \quad (S-DV)_{\alpha} + (S-DV)_{\beta} = (S-DV)_{\gamma}
\]

This implies that the solution to the system is:
\[
\text{(16)} \quad \alpha = \beta = \gamma
\]
The figure represents a 2D field log curve and residuals for simulated Poisson data.

Figure 2. Field Log Curves and Residuals for Simulated Poisson Data.

The figure shows two field log curves and their corresponding residuals. The curves represent the theoretical or expected data, while the residuals indicate the discrepancy between the observed and expected values. The residuals are typically used in statistical analysis to assess the goodness of fit of a model to the data. In the context of the figure, these residuals help to evaluate how well the model fits the simulated Poisson data.