Exponential models... via log-model expansions

Normal model

Exponential model... second order... easy/accurate... just need \( \Phi(n-n' \log n') \) etc... easy.

\[
f(y; \theta) = c \exp\{y(\theta) \phi(y) - k(\theta) \psi(y)\}
\]

can var/pars \( \Theta \rightarrow \Theta \), suffic Cond. likelihood is correct at each point

"Fourier inversion..." Cheap! Easy

A Taylor view of \( r \) and \( n_i \) in general models" #6 on web page... jean-francois.

\[
\text{Exp Models (Normal)} \quad \rightarrow \quad f(y; \theta) \rightarrow f(s; \phi)
\]

\[
\frac{e^\theta}{(2\pi)^{0.5}} \exp\left\{ -\frac{(s-y)^2}{2} + g(y) \psi(y) \right\}
\]

Integration \( \rightarrow \) convergence \( \rightarrow \) \( \phi \) \( \rightarrow \) \( 0 \)

Regularly

Asymptotic

\( n \rightarrow \infty \)
Scalar Exp'ly model: centered 

\begin{align*}
\text{2nd order} \quad f(s; \theta) &= \frac{1}{(2\pi)^{3/2}} \exp \left\{ -\frac{(s - \theta_0)^2}{2} \cdot \frac{\theta_3^2}{6\theta_2^{3/2}} + \theta_3 \frac{\theta_2^3}{6\theta_2^{3/2}} \right\} (1 - \theta_0 \theta_2^{1/2}) \\
&= \phi(s - \theta_0) \left\{ 1 - \frac{\theta_3^2}{6\theta_2^{3/2}} + \theta_3 \frac{\theta_2^3}{6\theta_2^{3/2}} - \frac{\theta_3}{2\theta_2^{1/2}} \right\} \\
\end{align*}

\[ E\{e^{s_1^2 + s_2^2 + s_3^2}; \theta_0\} = 0 \quad \text{and} \quad E\{e^s; \theta_0\} = \frac{1}{\theta_0} \]

Centering, scaling: Regularly Append \(-s_2^{1/2} + \theta_0 s_2\) to unstable other linear determ.

One parameter (math) \(\theta_3\) Get \(s^3\) etc as above.

"Second" NLN model \( \Rightarrow 264.pdf \); Jean-François (and) simplici.. 264.pdf -- why not go vector.
2) Scalar $y_1$, Scalar $\theta$

Niceness of $f(y, \theta)$ Location

Ex: $y \sim N(\theta, \sigma^2)$, $y \sim EV(\theta)

Relevant than exp

a) "frequentist"

$p(\theta) = \text{"prior(left) data on para scale } \theta\text{"}

- Prob left if data not para

$b) \text{Bayesian}\n
s(\theta) = \int f(y, \theta) \, dy

\theta = \int y \, f(y, \theta) \, dy

L(\theta) = f(y, \theta) \pi(\theta)

Bayes is confidence

Priors

Welch & Peers 1963 & Bayesian

Examination

For State Exam, Jeffreys prior: roots into prior

Gives conf to 2nd order

Says: Scalar Expert model is a - Cochr to 2nd order
Jeffreys (1763) | Geophysical
| Prob/Prob
Huge effect (prob/math)

Jeffreys prior

\[ \nabla / \theta ; y) = \frac{L(\theta) \lambda(\theta)}{\lambda(\theta)} \]

Info/Accuracy

Jeffreys' 1964: "Problems"

Modified Jeffreys

What priors?

Jeffreys

Other proposals: -- Bayes literature

Jeffreys

Fisher

Plate Tectonics Nonsense

Collect data on magnetism; \( \nabla \in \mathbb{R}^3 \); analysis decisive \( \Rightarrow \) Plate.