Bayesian models 3 - Stan

October 16, 2019

Example: Generalised linear models

Numbers of beetles killed `r` out of number exposed `m` to some concentration of carbon disulphide `x` for five hours.

Fit using a logit link.

`beetles-glm-data.txt`

Generalised linear models

Model:

$$
\begin{aligned}
r_i &\sim \ \text{Binomial}(m_i, p_i) \\
&\quad i = 1, \ldots, n \\
p_i &= \ \text{logistic}(\alpha + \beta(x_i - \overline{x}_\cdot))
\end{aligned}
$$

Prior:

$$
\begin{aligned}
\alpha &\sim \ \text{Normal}(0, (100)^2) \\
\beta &\sim \ \text{Normal}(0, (100)^2)
\end{aligned}
$$

Stan example: See Stan_binomial_regression.pdf and
beetles-glm.stan.