

Brost, B. M., M. B. Hooten, E. M. Hanks, and R. J. Small. 2016. Animal movement constraints improve resource selection inference in the presence of telemetry error. *Ecology*.

Appendix A. Complete specification of mixture t model used for the simulation study and harbor seal analysis.

Specification of mixture t model used for the simulation study and harbor seal analysis. Argos location quality class is indexed by c .

$$\begin{aligned}
 \mathbf{s}_{tc} &\sim \begin{cases} t(\boldsymbol{\mu}_t, \boldsymbol{\Sigma}_c, \nu_c), & \text{with prob. } 0.5 \\ t(\boldsymbol{\mu}_t, \tilde{\boldsymbol{\Sigma}}_c, \nu_c), & \text{with prob. } 0.5 \end{cases} \\
 \boldsymbol{\Sigma}_c &= \sigma_c^2 \begin{bmatrix} 1 & \rho_c \sqrt{a_c} \\ \rho_c \sqrt{a_c} & a_c \end{bmatrix} \\
 \tilde{\boldsymbol{\Sigma}}_c &= \sigma_c^2 \begin{bmatrix} 1 & -\rho_c \sqrt{a_c} \\ -\rho_c \sqrt{a_c} & a_c \end{bmatrix} \\
 \boldsymbol{\mu}_t &\sim \frac{\exp \{ \mathbf{x}'(\boldsymbol{\mu}_t) \boldsymbol{\beta} - \eta(\boldsymbol{\mu}_t, \boldsymbol{\mu}_{t-\Delta_t}) \}}{\int_{\mathcal{S}} \exp \{ \mathbf{x}'(\boldsymbol{\mu}) \boldsymbol{\beta} - \eta(\boldsymbol{\mu}, \boldsymbol{\mu}_{t-\Delta_t}) \} d\boldsymbol{\mu}} \\
 \eta(\boldsymbol{\mu}_t, \boldsymbol{\mu}_{t-\Delta_t}) &= \frac{d(\boldsymbol{\mu}_t, \boldsymbol{\mu}_{t-\Delta_t})}{\Delta_t \phi} \\
 \sigma_c &\sim \text{Unif}(0, 20000) \\
 a_c &\sim \text{Unif}(0, 1) \\
 \rho_c &\sim \text{Unif}(0, 1) \\
 \nu_c &\sim \text{Unif}(0, 30) \\
 \phi &\sim \text{Unif}(0, 750) \\
 \boldsymbol{\beta} &\sim \text{N}(\mathbf{0}, 10^2 \times \mathbf{I})
 \end{aligned}$$