

Quadratically constrained likelihood estimation for exponential regression under censoring

Julianna Holmberg¹, Laila Hübbert^{1,2}, Dietrich von Rosen¹, and Martin Singull¹

¹ *Linköping University, Sweden*

² *Region Östergötland, Department of Cardiology, Norrköping, Sweden*

Abstract

Parametric survival models are commonly estimated using unconstrained maximum likelihood, even when prior knowledge suggests that the effects of covariates on the hazard should satisfy structural constraints. In this presentation, we consider exponential regression under right-censoring with a quadratic constraint, leading to maximum likelihood estimation over a restricted parameter space. A simulation study demonstrates the bias-variance trade-off induced by the constraint and compares the estimator with the standard maximum likelihood estimator and ridge-type penalised estimators. An application to real survival data illustrates the proposed method.

Keywords

Exponential regression, Right-censored survival data, Constrained maximum likelihood

Acknowledgements

Julianna Holmberg was supported by the Research School in Interdisciplinary Mathematics.