

## Parameter redundancy of mixture models in mark recovery

Chen Yu<sup>a</sup> and Diana Cole<sup>b</sup> and Byron Morgan<sup>c</sup>

School of Mathematics, Statistics and Actuarial Science

University of Kent

Canterbury, England

<sup>a</sup> [cy52@kent.ac.uk](mailto:cy52@kent.ac.uk)

<sup>b</sup> [d.j.cole@kent.ac.uk](mailto:d.j.cole@kent.ac.uk)

<sup>c</sup> [b.j.t.morgan@kent.ac.uk](mailto:b.j.t.morgan@kent.ac.uk)

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**Abstract:** Mark-recovery methods are used to estimate the survival of marked wild animals, through the fitting of appropriate probability models to field observations. Of interest here are popular classes of mixture model, which may be both finite, infinite, or used in combination.

We focus on finite mixture models, which can introduce a large number of parameters that may require constraints to be applied in order for all the parameters to be estimated. This work is motivated by Pledger and Schwarz (2002). We provide for the first time a formal analysis of these models, using the methods of computational symbolic algebra introduced by Catchpole and Morgan (1997). This provides an illustration of the different steps that need to be carried out, using the recent developments of Cole et al (2010). We derive terms that define mixture model structures, called exhaustive summaries, and show how those terms are related to the number of estimable parameters.

### References

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