Correction to "On Bayesian analysis of mixtures with an unknown number of components"

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We regret to report that there is an error in equation (12) of Richardson and Green (1997), concerning the birth/death move for empty components. The correct expression is

$$\begin{aligned} A &= \frac{p(k+1)}{p(k)} \frac{1}{B(k\delta, \delta)} w_{j^*}^{\delta-1} (1-w_{j^*})^{n+k\delta-k} (k+1) \\ &\times \frac{d_{k+1}}{(k_0+1)b_k} \frac{1}{g_{1,k}(w_{j^*})} (1-w_{j^*})^{(k-1)}. \end{aligned}$$

In the paper as printed, the power of $(1-w_{j^*})$ in the final factor, the Jacobian term, was given as k instead of $(k-1)$. The source of the error was neglect of the condition $\sum_j w_j = 1$ in computing the partial derivatives of w_j' with respect to w_j. Note that expression (11) for the split/combine move acceptance ratio is correct as printed.

Having made the correction, we repeated the calculations leading to all of the numerical results reported in the paper. As might be expected, the effects of the error are noticeable but small. The maximum changes to any of the posterior probabilities $p(k|y)$ presented in Tables 1 and 2 and Figure 6 are 0.015, 0.011 and 0.020 respectively; in each case the maximum discrepancy occurs near the mode of the distributions, and so has little impact. The error in Figure 2 is within plotting accuracy. In none of the Figures is the visual impression altered, and none of our qualitative conclusions are affected.

We are grateful to Tobias Ryden of Lund University for discovering this error, and we apologise for any confusion it has caused.

Reference

Richardson, S. and Green, P. J. (1997) On Bayesian analysis of mixtures with an unknown number of components (with Discussion). *J. Roy. Statist. Soc.*, B, **59**, 731–792.

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