

Erratum to: Localizing the latent structure canonical uncertainty: entropy profiles for hidden Markov models

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In the original publication of this article, equation layouts are aligned incorrectly. Now the correct version is appears in this erratum.

Layout of equations

In Sect. 2.1 paragraph 1, the equation should read

$$P(X_0 = x_0, \dots, X_{T-1} = x_{T-1} | S_0 = s_0, \dots, S_{T-1} = s_{T-1}) \\ = \prod_{t=0}^{T-1} P(X_t = x_t | S_t = s_t).$$

Equation (6) should read

$$H(S_0 | S_1 = j, X_0^1 = x_0^1) \\ = - \sum_{i=0}^{J-1} P(S_0 = i | S_1 = j, X_0^1 = x_0^1) \\ \times \log P(S_0 = i | S_1 = j, X_0^1 = x_0^1). \quad (6)$$

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Equations in (7) should read

$$H(S_0^{t-1} | S_t = j, X_0^t = x_0^t) \\ = - \sum_{s_0, \dots, s_{t-1}} P(S_0^{t-1} = s_0^{t-1} | S_t = j, X_0^t = x_0^t) \\ \times \log P(S_0^{t-1} = s_0^{t-1} | S_t = j, X_0^t = x_0^t) \\ = - \sum_{s_0, \dots, s_{t-2}} \sum_{i=0}^{J-1} P(S_0^{t-2} = s_0^{t-2} | S_{t-1} = i, S_t = j, X_0^t = x_0^t) \\ \times P(S_{t-1} = i | S_t = j, X_0^t = x_0^t) \\ \times \left\{ \log P(S_0^{t-2} = s_0^{t-2} | S_{t-1} = i, S_t = j, X_0^t = x_0^t) \right. \\ \left. + \log P(S_{t-1} = i | S_t = j, X_0^t = x_0^t) \right\} \\ = - \sum_{i=0}^{J-1} P(S_{t-1} = i | S_t = j, X_0^{t-1} = x_0^{t-1}) \\ \times \left\{ \sum_{s_0, \dots, s_{t-2}} P(S_0^{t-2} = s_0^{t-2} | S_{t-1} = i, X_0^{t-1} = x_0^{t-1}) \right. \\ \left. \times \log P(S_0^{t-2} = s_0^{t-2} | S_{t-1} = i, X_0^{t-1} = x_0^{t-1}) \right. \\ \left. + \log P(S_{t-1} = i | S_t = j, X_0^t = x_0^t) \right\} \\ = \sum_{i=0}^{J-1} P(S_{t-1} = i | S_t = j, X_0^{t-1} = x_0^{t-1}) \\ \times \left\{ H(S_0^{t-2} | S_{t-1} = i, X_0^{t-1} = x_0^{t-1}) \right. \\ \left. - \log P(S_{t-1} = i | S_t = j, X_0^{t-1} = x_0^{t-1}) \right\}, \quad (7)$$

Page 4, the equation in the remark at the bottom of the second column should read

$$\begin{aligned}
 &H(S_0^{t-1}|S_t = j, X_0^t = x_0^t) \\
 &= H(S_0^{t-2}|S_{t-1}, S_t = j, X_0^t = x_0^t) \\
 &\quad + H(S_{t-1}|S_t = j, X_0^t = x_0^t)
 \end{aligned}$$

Page 7, the first equation of the first column should read

$$\begin{aligned}
 &P(S = s|X = \mathbf{x}) \\
 &= \prod_u P(S_u = s_u | S_{pa(u)} = s_{pa(u)}, X = \mathbf{x}),
 \end{aligned}$$

Equation (13) should read

$$\begin{aligned}
 &P(S_A = s_A | X = \mathbf{x}) \\
 &= \prod_{v \in A} P(S_v = s_v | S_{pa(v)} = s_{pa(v)}, X = \mathbf{x}). \tag{13}
 \end{aligned}$$

Page 7, the first equation of the second column should read

$$\begin{aligned}
 &P(S_{A'} = s_{A'} | X = \mathbf{x}) \\
 &= P(S_u = s_u | S_{pa(u)} = s_{pa(u)}, \\
 &\quad S_{A \setminus pa(u)} = s_{A \setminus pa(u)}, X = \mathbf{x}) \\
 &\quad \times P(S_{pa(u)} = s_{pa(u)}, S_{A \setminus pa(u)} = s_{A \setminus pa(u)} | X = \mathbf{x}) \\
 &= P(S_u = s_u | S_{pa(u)} = s_{pa(u)}, X = \mathbf{x}) P(S_A = s_A | X = \mathbf{x})
 \end{aligned}$$

In Appendix 1 the first equation (Proposition 2) should read

$$\begin{aligned}
 &P(\bar{S}_Y = \bar{s}_Y | X = \mathbf{x}) \\
 &= P(S_r = s_r | X = \mathbf{x}) \prod_{\substack{u \in \mathcal{V} \\ u \neq r}} P(S_u = s_u | S_{\rho(u)} = s_{\rho(u)}, X = \mathbf{x})
 \end{aligned}$$

In Appendix 2, equations in (19) and (20) should read

$$\begin{aligned}
 &P(\bar{S}_{c(u)} = \bar{s}_{c(u)} | S_u = j, \bar{S}_{0 \setminus u} = \bar{s}_{0 \setminus u}, X = \mathbf{x}) \\
 &= P(\bar{S}_{c(u)} = \bar{s}_{c(u)} | S_u = j, S_{\rho(u)} = s_{\rho(u)}, X = \mathbf{x}) \\
 &= P(\bar{S}_{c(u)} = \bar{s}_{c(u)} | S_u = j, X = \mathbf{x}) \\
 &= \prod_{v \in c(u)} P(\bar{S}_v = \bar{s}_v | S_u = j, X = \mathbf{x}) \\
 &= \prod_{v \in c(u)} P(\bar{S}_v = \bar{s}_v | S_u = j, \bar{X}_v = \bar{x}_v) \tag{19} \\
 &= P(\bar{S}_{c(u)} = \bar{s}_{c(u)} | S_u = j, \bar{X}_u = \bar{x}_u), \tag{20}
 \end{aligned}$$

In Appendix 2, the equations following (20) should read

$$\begin{aligned}
 &P(\bar{S}_u = \bar{s}_u | \bar{S}_{0 \setminus u} = \bar{s}_{0 \setminus u}, X = \mathbf{x}) \\
 &= P(\bar{S}_u = \bar{s}_u | S_{\rho(u)} = s_{\rho(u)}, X = \mathbf{x}) \\
 &= P(\bar{S}_u = \bar{s}_u | S_{\rho(u)} = s_{\rho(u)}, \bar{X}_u = \bar{x}_u).
 \end{aligned}$$

In Appendix 2, the equations in (21) should read

$$\begin{aligned}
 &H(\bar{S}_{c(u)} | S_u = j, \bar{X}_u = \bar{x}_u) \\
 &= H(\bar{S}_{c(u)} | S_u = j, \bar{X}_{c(u)} = \bar{x}_{c(u)}) \\
 &= \sum_{v \in c(u)} H(\bar{S}_v | S_u = j, \bar{X}_v = \bar{x}_v). \tag{21}
 \end{aligned}$$

In Appendix 2, the equations in (25) should read

$$\begin{aligned}
 &H(\bar{S}_u | S_{\rho(u)}, X = \mathbf{x}) \\
 &= H(S_u | S_{\rho(u)}, X = \mathbf{x}) + H(\bar{S}_{c(u)} | S_u, X = \mathbf{x}) \\
 &= H(S_u | S_{\rho(u)}, X = \mathbf{x}) \\
 &\quad + \sum_j L_u(j) H(\bar{S}_{c(u)} | S_u = j, X = \mathbf{x}), \tag{25}
 \end{aligned}$$