

Errata list for Bayesian Networks and Decision Graphs (second edition)*

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Semantic corrections

Page 8: $P(A, B) = \dots$ should be $\sum_A \sum_B P(A, B) = \dots$

Page 12, bottom: Table 1.2 should be Table 1.9.

Page 13:

- In the caption of Table 1.8, the reference should be to Table 1.7 and not a self-reference to Table 1.8.
- In the caption for Table 1.9, the reference should be to Table 1.8 and not Table 1.1.

Page 17, Exercise 1.6: The union should be an intersection.

Page 25₅: negative should be positive.

Page 30, second condition on d-separation: "have recieved evidence" may be misunderstood as "have received evidence through propagation". Instead: "have been updated with direct evidence".

Page 49, Exercise 2.19: Switch A and B in DAG (a) so that we get $B \leftarrow A \rightarrow C$.

Page 79: $5^{11} \approx 50,000,000$ and not 5,000,000.

Page 81, bottom: " $P(B)$ and $P(C|A)$ " should be " $P(C)$ and $P(B|A)$ ".

Page 107, Exercise 3.28: The evidence that you receive should be $A = y$ and $B = n$.

Page 114₆: The elimination order should be A_6, A_5, A_3, A_1, A_4 instead of A_6, A_5, A_3, A_1, A_2 . The same holds in Figure 4.7.

Page 134, Fig. 4.28: clique BCF should be BDF .

Page 134, remark just above Example 4.4: Disregard sentence referencing Section 4.5.2 (the domain graph is triangulated).

Pages 142, 143: The elimination sequences should go from leaf to root, rather than in the opposite direction. That is, BAECD should be DCEAB and DCEBA should be ABECD?

Page 144⁷: the a-cutset for the node labelled \sum_A is $\{B, C, D\}$.

*If you have further corrections, please send a mail to tdn@cs.aau.dk

Page 149: Replace E with X in the expression for $w(\mathbf{x}, \mathbf{e})$.

Page 155: Replace E with X in the expression for $w(\mathbf{x}, \mathbf{e})$.

Page 161, Figure 4.48: The moral graph is not triangulated. Instead, add the arc $F \rightarrow D$ to the original graph.

Page 162, Exercise 4.25: Unfortunately, this exercise is not well formulated. We assume that we have the following potentials:

$\phi_1(A, B, C, D), \phi_3(D, E, F, I), \phi_5(C, G, H, J), \phi_6(B, C, D, G), \phi_{10}(B, C, D, E)$.

The formulation is not clear on what to collect to. Take the rather unconventional task to collect to the *separator* CG .

Page 196₁₂: "Given that 80 out of 100 landed *pin up*."

Page 199⁸: *maximum posterior parameters* or *posterior means*.

Page 212₁: these numbers can be given more accurately. With $\sigma = \frac{0.1}{6}$ you find $\mu = 0.35$ (exact), $s = 818$ and $n_1 = 286.3$.

Page 227, Exercise 6.12: Disregard the references to parameter u (i.e., s_u); it doesn't appear in Example 6.4.1.

Page 227, Exercise 6.14: Assume that in example 6.4.1 we require $P(A|c) = (0.5, 0.5)$. Use the technique from Example 6.4.1 to tune the parameters t and s .

Page 234, Theorem 7.1: The conditions should be " $I(A, B, pa((A)\setminus B))$ or $I(B, A, pa((B)\setminus A))$ "

Page 235¹²: "Let the oracle answer in correspondenc with the d-separation properties of the network in Figure 7.6 (a). We start ...".

Page 235₇: The queries $I(B, C, D), I(B, C, E)$ should not be asked as the link $B-C$ is removed already.

Page 236, Property 1: If the oracle reflects the d-separation properties of N , then ...".

Page 240: In Equation 7.3, $|pa(X)|$ should be $|sp(pa(X))|$. Also, let $|sp(pa(X))| = 1$ if $pa(X) = \emptyset$.

Page 245: In the calculation of the BIC score, it should be $4 \cdot \log\left(\frac{4}{6+4}\right)$ rather than $6 \cdot \log\left(\frac{4}{6+4}\right)$.

Page 254: In Equation 7.9, r_1 should be r_i (similarly in the example on the page 255).

Page 256: $\rho(X_i, pa(X_i)) = \kappa^{\sum_{i=1}^n \delta_i}$ should be $\rho(S) = \kappa^{\sum_{i=1}^n \delta_i}$. I.e., substitute $X_i, pa(X_i)$ with S .

Page 257¹¹: $\delta_2^{B_3}$ should equal 0. As a result $P(B_3) = c \cdot \kappa^1$ and the order of B_1 and B_3 in the subsequent sentence should be reversed.

Page 294, Fig. 9.11: two probabilities are missing in the SP-T strategy: $p(\text{ok}) = 0.71$ and $p(\neg\text{ok}) = 0.29$.

Page 307₆: MSC should be added to the statespace of δ_D .

Page 319, Fig. 9.34: all D_i should be $O_i, i = 1, 2$.

Page 326, Table 9.5: The table shall include a *sink* (with no reward), which can only be reached from (3, 1), and this with probability 1 regardless of the move.

Page 392, Figure 10.35: There should also be links $FV_i \rightarrow FV_{i+1}$.

Page 409: In the formula for $EV(T)$ the factor is $P(t)$ and not $P(t|d)$. The formula only makes sense when the distribution of T does not depend on d .

Typos, misspellings, etc.

Page 13, Tables 1.8 and 1.9, bottom row: c_2 should be c_3 .

Page 36, Table 2.1: Sp should be SP .

Page 51₅: “hypothesis variables” rather than “hypothesis variable”.

Page 57, Fig 3.9: “(a), (b), (c), and (d)” are missing below the figures.

Page 77, caption of Fig. 3.24(b): “represents” rather than “represent”.

Page 79, caption of Fig. 3.26: “a logical-or”.

Page 87₁₅: add ‘)’ after exercise.

Page 94: The square-root should also cover σ^2 .

Page 94, Fig. 3.48: μ and σ should be switched for the first distribution.

Page 95₁₃: $0,87(n)$ should be $0.87(n)$.

Page 96¹: “discrete variables” rather than “discrete variable”.

Page 99: Example 3.9 should be Exercise 3.9.

Page 105, Exercise 3.15: $FC1$ should be FC and $FC2$ should be SC .

Page 106¹: “on the basis of” rather than “in the basis of”.

Page 110, third paragraph: ... before you marginalize A_5 out (rather than A_3).

Page 125₄: “A junction tree” rather than “The junction tree”.

Page 128¹⁰: Example 5.3 should be Example 4.3.

Page 142⁵: ”condition on” rather than ”condition in”.

Page 143, caption of Figure 4.38: the sequence should be B,A,E,C,D.

Page 155₁₀: “random configurations” rather than “random configuration”.

Page 161²: ”nodes, where”.

Page 161⁹: ”an incomplete”.

Page 163: Too much space after **Exercise 4.30**.

Page 166, Exercise 4.42: Table 4.41 should be Table 4.6, Figure 4.46 should be Figure 4.40.

Page 175²: Add ‘)’.

Page 178₁: Exercise 5.8 should be Exercise 5.13.

Page 181, Table 5.4: e should be e' .

Page 183⁸: “ H -saturated” should be “ h -saturated”.

Page 188, 5.7.2, line 1: “Let s and r be two parameters” rather than “Let s and u be two parameters”.

Page 197¹³: ”deemed impossible”.

Page 197, last equation: 1 *up* should be *pin up*.

Page 221, line above Fig. 6.10: t should be \mathbf{t} .

Page 221, Fig. 6.10: t_0 should be \mathbf{t}_0 .

Page 222: replace t with \mathbf{t} in $\mathbf{grad} x(t)$, in $\mathbf{grad} x(t_0)$, and in $\mathbf{grad} x(t_1)$.

Page 227, Exercise 6.11: It should be Exercise 6.10 (ii) and not Exercise 6.10 (iii).

Page 229: Equation 7.1 should be

$$f(n) = \sum_{i=1}^n (-1)^{i+1} \frac{n!}{(n-i)!i!} 2^{i(n-i)} f(n-i),$$

for $n \geq 2$ and $f(0) = f(1) = 1$.

Page 240, legend of figure 7.12: double ':':

Page 287 throughout: "prize/prizes" rather than "price/prices".

Page 289₁₇: "It turns out ...".

Page 291, Figure 9.8: The arc from T_A to D_2 should be labeled 'neg' (similar from T_B to D_2 in Figure 9.9). The values of ($D_1 = T_A, T_A = \cdot, D_2 = \text{pour}, Inf = \text{clean}$) should be 99.94 (not 99.74) and the values of ($D_1 = T_A, T_A = \cdot, D_2 = \text{pour}, Inf = \text{infected}$) should be -0.06 (not -0.26).

Page 428, Exercise 11.3: The reference should be Figure 9.4 instead of 9.3.