Errata

The following errors were found in the second printing of Dean, Allen and Aloimonos, 1991. Corrections to the first printing are also included below.

- Page 165

  The description of the α-β search algorithm is incorrect. The corrected description (provided by Kee-Eung Kim) is shown below with changes highlighted in boxes.

  Procedure **back up** $\boxed{\text{non-recursive}}$

  1. Let v be the current value of n.
  2. Let m be the parent of n and u the current value of m.
  3. If m is a maximizing node, then set the value of m to be the maximum of u and v.
  4. If m is a minimizing node, then set the value of m to be the minimum of u and v.

  Procedure α-β **search**

  1. Set N to be the list consisting of the single element, m.
  2. Let n be the first node in N.
  3. If $n = m$ and n has been assigned a value, then exit returning this value.
  4. Try to prune n as follows. If n is a maximizing node, let v be the minimum of the values of siblings of n, and u be the maximum of the values of siblings of ancestors of n that are minimizing nodes. If $\boxed{v \leq u}$, then you can remove n and its siblings and any successors of n and its siblings from N. If $\boxed{n}$ is a minimizing node, then proceed similarly switching min for max, max for min, and $\leq$ for $\geq$.
  5. If n cannot be pruned, then if n is a terminal node or we decide not to expand n, assign n the value determined by the evaluation function and **back up** the value at n.
  6. Otherwise, remove n from N, add the children of n to the front of N, and assign the children initial values so that maximizing nodes are assigned $-\infty$, and minimizing nodes are assigned $+\infty$.

- Page 372

  In the in-line diagram at the bottom of the page, the horizontal arrows should all be pointing toward the center node, i.e., X_2.

- Page 384

  The description of the likelihood-weighting algorithm is incorrect. In particular the statement that "In the following algorithm, if a sample does not agree with the evidence, instead of throwing it away we give the sample the following weight:" is incorrect. The description should read "In the following algorithm, if we reach an evidence node in the process of sampling, we assign the node the value provided by the evidence; the sample is then given the following weight:" The equation describing the sample weight is correct.

  The specification of the algorithm has to be changed to reflect this correction. Specifically, Step 2.b on Page 384 should read: "For all X in N, if X is assigned a value by the evidence, then set X to be $\mathcal{E}(X)$; otherwise set the value of X to be $\bot$."

  This mistake also crops up in the Lisp code in the Appendix so that the procedure definition on Page 405

  ```
  (defun initialize-values (nodes evidence)
    (mapc #'(lambda (n)
              (let ((pair (assoc n evidence)))
                (if (and pair (null (NODE-parents n)))
                    (set-NODE-value n (second pair))
                    (set-NODE-value n nil))))
          nodes))
  ```

  should be changed to the following:

  ```
  (defun initialize-values (nodes evidence)
    (mapc #'(lambda (n)
              (let ((pair (assoc n evidence)))
                (if pair
                    (set-NODE-value n (second pair))
                    (set-NODE-value n nil))))
          nodes))
  ```

- Page 389

  There was an typo in the description of the noisy-OR mode. In the QMR network, there are many findings and hypotheses that have many parents. The noisy-OR model provides a means of simplifying nodes with many parents. See the discussion on Page 386–388 and note the typographical error in the discussion concerning the probabilities. Let

  $$\Pr(F = \text{True}|H_i = \text{True}, H_j \neq i) = p_i$$

  so that

  $$\Pr(F = \text{False}|H_i = \text{True}, \bar{H}_j \neq i) = 1 - p_i$$

  where $H_i = \text{True}$ indicates that the hypothesis H_i is true, and $\bar{H}_j \neq i$ indicates that all of the other hypotheses (except H_i) are false.

  Then the conditional probability distribution is defined as follows

  $$\Pr(F = \text{False}|H_1, H_2, ..., H_n) = \prod_{i \in T}(1 - p_i)$$

  and

  $$\Pr(F = \text{True}|H_1, H_2, ..., H_n) = 1 - \prod_{i \in T}(1 - p_i)$$

  where T is the set of all indices corresponding to hypotheses which are true

  $$T = \{i|H_i \text{ is true}\}$$

The following errors were corrected in the first printing of Dean, Allen and Aloimonos, 1991.

- Page 207

  In the first equation at the top of the page, change $\ldots = \frac{2}{|T|} \ldots$ to $\ldots = -\frac{2}{|T|} \ldots$ that is to say, insert a minus sign between the "=" sign and the fraction $\frac{2}{|T|}$.

- Page 371

  The nodes in the in-line diagram of the chain graph should be labeled left to right S, D, and C. Currently there are two D's instead of a C and D.

- Page 385

  Change "number of times each variable is assigned a given variable" to "number of times each variable is assigned a given value" — i.e., change "variable" to "value."

- Page 392

  There are no dashes through arcs in Figure 8.14. This graphical convention is not introduced until Figure 8.15 contrary to the comment in the text.

- Page 492

  In Figure 10.1, the last sentence of the caption, change "Posthead components are also optional are generally take the form of modifiers." to "Posthead components are also optional and generally take the form of modifiers" — i.e., change "are" to "and."

- Page 493

  In last paragraph, change "...derivation of rewrite rules from S ..." to "...derivation from S using rewrite rules ..."

- Page 498

  In the last sentence in the last full paragraph, change "running in" to "running on."

- Page 498

  The tree in Figure 10.4 is missing two subtrees. The node labelled ((NP)(Sue)) and the node labelled ((NAME)(Sue)) should each have two descendents.

- Page 499

  In Figure 10.5 the node labelled ((ART N VP)(the Sue saw)) should be a descendent of the ((NP VP)...) node, not the ((S)...) node.

- Page 503–504

  "ROOT" should be included in the list of useful features.