Addendum

May 16, 2006

p 59 para 1: Comment: The proposed graph matching algorithm is similar to *RANSAC* [142] in the way that the minimum number of data points (three vertex matches) is used to instantiate the free model parameters (the robot's pose), which in turn is used to find other inliers (consistent vertex matches). Unlike RANSAC, however, the proposed algorithm deterministically selects the initial data points, instead of randomly doing so, and there is no preconceived notion of what constitutes a correct match.

p 59 para 3: replace sentence 2 with "A unique pose is found if the three vertices are not collinear, otherwise a conjugate pair is obtained. In the latter case, if the vertices have unequal spacing between them, then the pair can be resolved using ordering constraints (i.e., one hypothesis would require that the robot flip upside down)."

p 102: Replace the last sentence with "Notice that the deviation of the solution from ground truth is within the relative accuracy of standard GPS."

p 115: Some additional avenues for future research include: characterising the heuristic value of prioritising the vertices of the correspondence graph; using negative information (as discussed at the end of Section 4.2) to decrease the confidence in a data association; developing techniques for pruning ineffective landmarks from the map; detecting man-made structures, such as buildings (the features might include dihedral corners and planes); and developing a version that can operate with moving objects, such as people and vehicles, in the scene (depending on the scanning frequency).

p 135: Add reference:

[142] M. A. Fischler and R. C. Bolles, "Random sample consensus: A paradigm for model fitting with applications to image analysis and automated cartography," *Communications of the ACM*, vol. 24, no. 6, pp. 381–395, 1981.

p 138 figure B.1: To avoid any ambiguity in the annotation, it should be noted that the subscripts of the landmark variables "$\mathbf{x}_a$" and "$\mathbf{x}_b$" represent landmark indices, where $a, b \in \{1, \ldots, n\}$, whereas the subscripts of the radii "r_1" and "r_2" and distances "d_1" and "d_2" are used merely to differentiate one from the other.