Electronic Supplementary Material

1. Figure S1. Histogram shows the time taken by ants, the paths of which are shown in Fig. 3, to reach the edge of the release platform.

2. Figure S2. The interaction between the path integrator and landmarks. (a) Full-vector paths split into displacement locations, in which path integration information and the true home direction have different degrees of mismatch. Pictograms indicate release station position (black dots) relative to home vector direction (arrow). All paths are aligned with the true nest direction. (b) Homing duration of full-vector ants (black dots) and zero-vector ants (open dots) over the same distance. Overall, full-vector ants took longer (13.13±1.2 min; mean±SE) to find home compared to zero-vector ants (9.92±1.3 min; mean±SE; p=0.0161, t=2.462, t-test). However, the average homing times of full- and zero-vector ants differed significantly only when path integration direction and true nest direction were opposite to each other (Fig. S2b; FV: 17.69±2.8 min; ZV: 8.28±0.8 min; mean±SE; p=0.016, t=2.790, t-test).

3. Figure S3. The distance covered before the start of search of ants displaced to the distant site (Fig. 5d) plotted over the distance indicated by the home vector. Note that the majority of ants do not travel the full length of their home vector (indicated by the line of equality).

4. Figure S4. Image differences over orientation (rotational image difference functions) between oriented views recorded at the northern-most nest (see Fig. 2a) and nest-directed views at 0.5 m (green), 1 m (blue), 5 m (yellow) and 10 m (black) distance from the nest from top to bottom: to the South facing North, to the West facing East, to the North facing South and to the East facing West.

5. Figure S5. Identifying home direction from rotational image difference functions at the northern-most nest (see Fig. 2a). RotIDFs computed between nest-directed views at 0.5 m, 1 m and 5 m North, South, East and West of the nest (see schematic diagram on the right) and the views at the release sites 10 m of the nest in the same four compass directions. Thick blue line indicates the true home direction from the four release sites. Note that the true home direction at 10 m release sites can be distinguished from all other possible directions, if ants had recorded nest-directed views at distances further than 1 m away from the nest.
mean 12.2 +/- 7.7 s
N = 34; n = 63
Figure S4

North Nest

Orientation (degrees)

rms pixel difference

North of nest facing South

West of nest facing East

East of nest facing West
Figure S5

North Nest

Goal Snapshot Distance

0.5 m 1 m 5 m

10m North

10m East

10m South

10m West

Goal Snapshot Distance

Distance

10m 5m 1m 0.5m

Orientation (degrees)

-180 -90 0 90 180

rms pixel difference