

Supporting online material for

Place memory in crickets

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Running title: Place memory in crickets

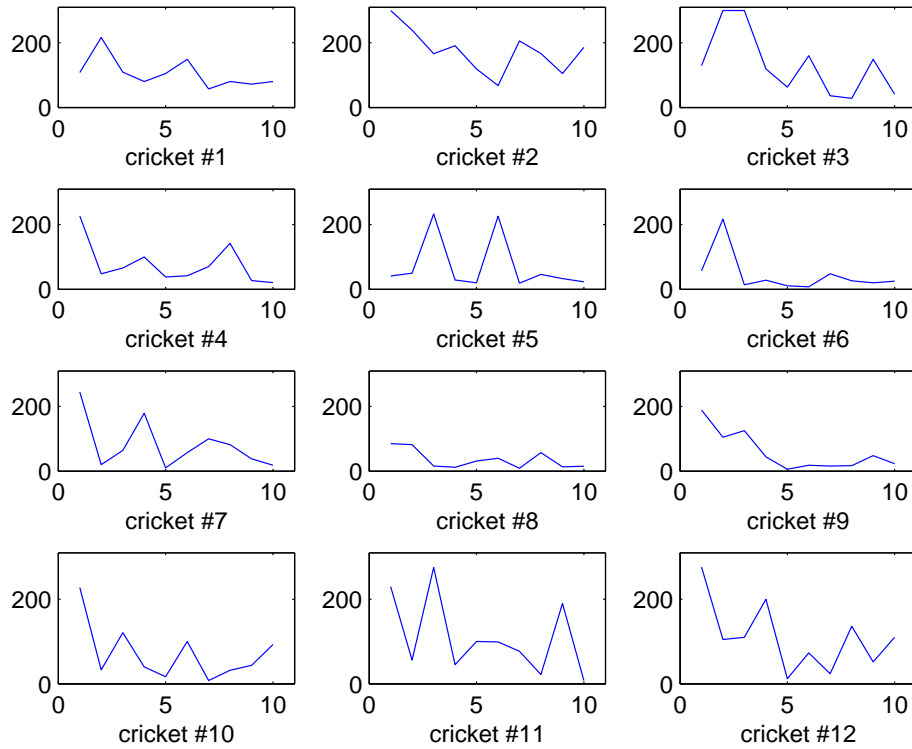
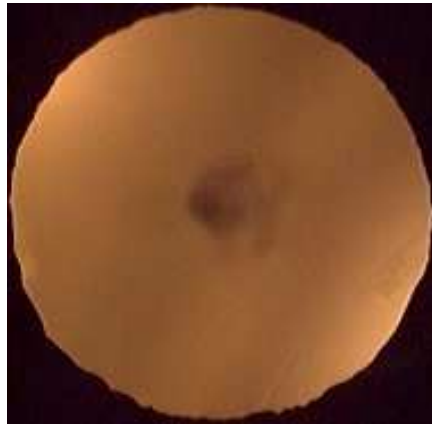
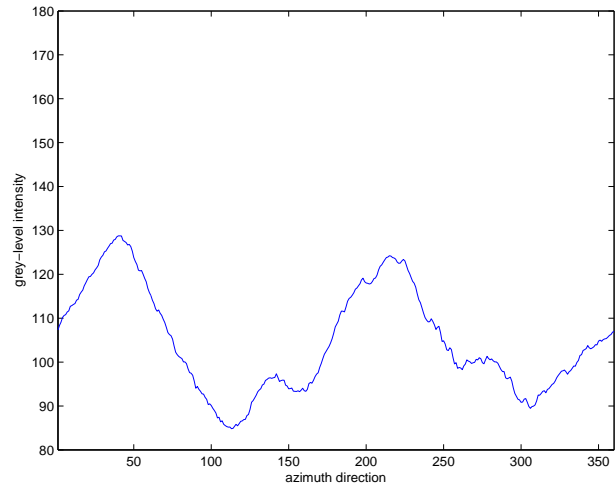


Figure 1: Individual times to reach cool spot in the 30cm arena setup illustrating the differences in performances. Crickets 6, 8 and 9 are individuals that, after learning, consistently and quickly relocated the cool spot in the remaining trials. Other crickets, e.g., 3, exhibit more varied responses from trial to trial, with some fast trials followed by trials containing extended bouts of wall following (possibly exploratory or escape behaviour) leading to longer durations. However, removing wall-following (c.f., figure 4 in the main document), the median times to reach the cool spot in the later trials were around 15 seconds.



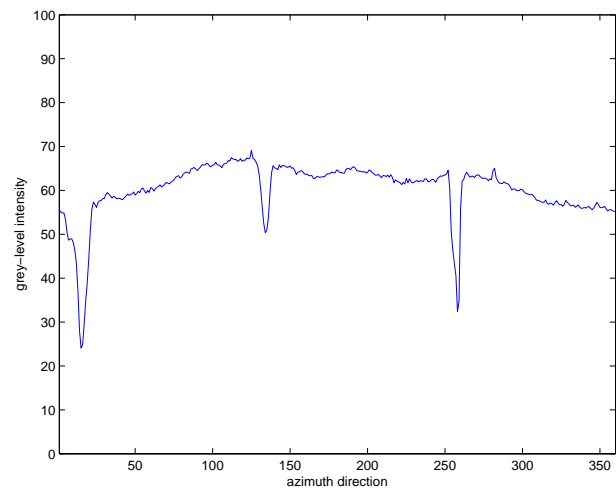
(a)



(b)



(c)



(d)

Figure 2: Crickets were still able to learn the task in the ‘no cues’ setup. However, though strong contrast cues on the arena walls were removed, the arena contained residual visual cues that could have been used for localisation. These can be seen in (a) and (c) which show panoramic snapshots inside the arena. We measured mean grey-level intensities for varying azimuth direction. (b) and (d) show the mean intensities for (a) and (c) respectively, clearly revealing the existence of directional information. In (d), the dips in grey-level intensities are caused by the supporting structure for the camera. We initially used the ‘no cues’ paradigm for consistency with the experiments by Mizunami *et. al* on cockroaches. Using an alternative control condition of total darkness (see paper) eliminated learning.

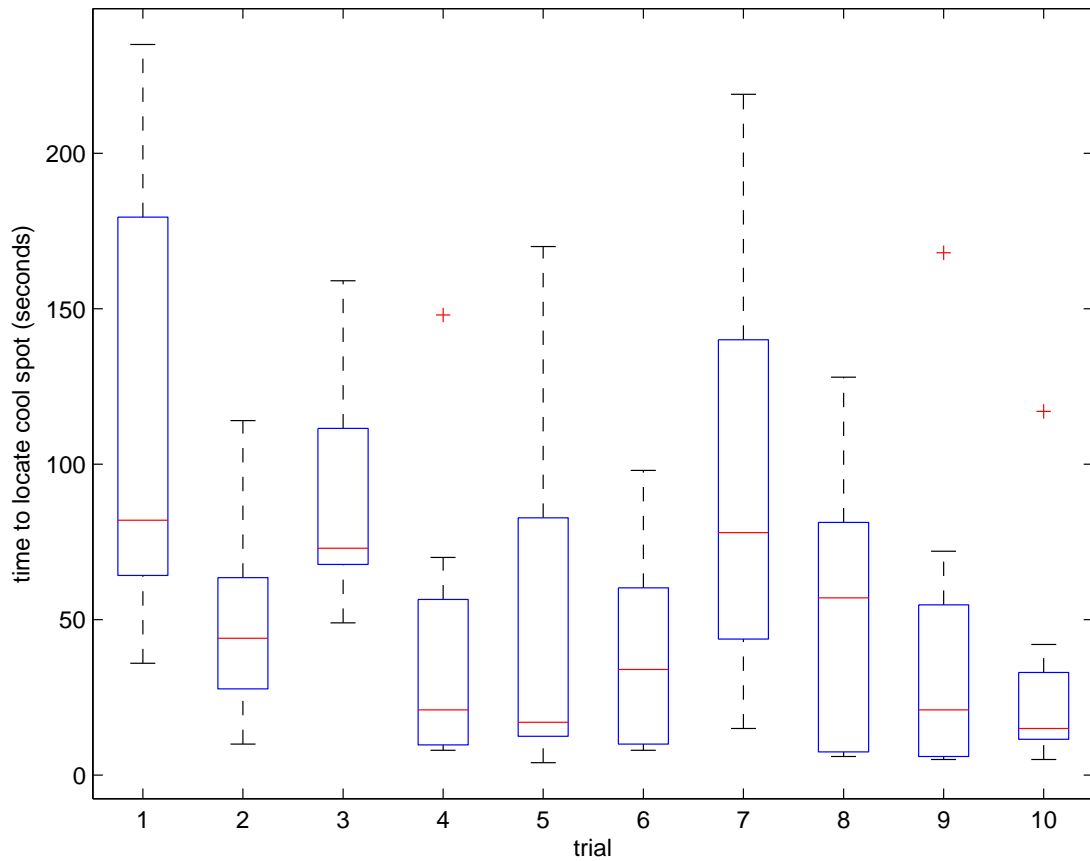


Figure 3: We hypothesised that as some species of male crickets defend territories or burrows, they might exhibit significantly better place memory than females. As shown here for the 'natural scene' setup in the 40cm arena, the male crickets were able to learn the task (comparing trials one and ten, Wilcoxon signed rank test: $p < 0.005$, $n = 10$) but there was no apparent superiority to the results with females shown in the paper.