Supplementary information

Table S1: Number of animals that have contributed to the different experimental groups before (in brackets) and after filtering out trials that did not fulfil the criteria listed in the materials and methods section. Overall 31 animals were tested, of which different subsets have contributed to the different experimental groups. For the 10 s long antennal stimulation 23 animals were tested in total, all but one under all 6 conditions. We measured responses to 30 s long contralateral or ipsilateral antennal stimulation in a subset of these 23 and 8 additional animals.

	Mesh alone (10 s)	Ipsilateral (10 s)	Contralateral (10 s)	Ipsilateral (30 s)	Contralateral (30 s)
Ascending (*far*, then *close*)	18 (23)	14 (22)	17 (22)	19 (26)	19 (26)
Descending (*close*, then *far*)	19 (22)	14 (22)	18 (22)	-	-

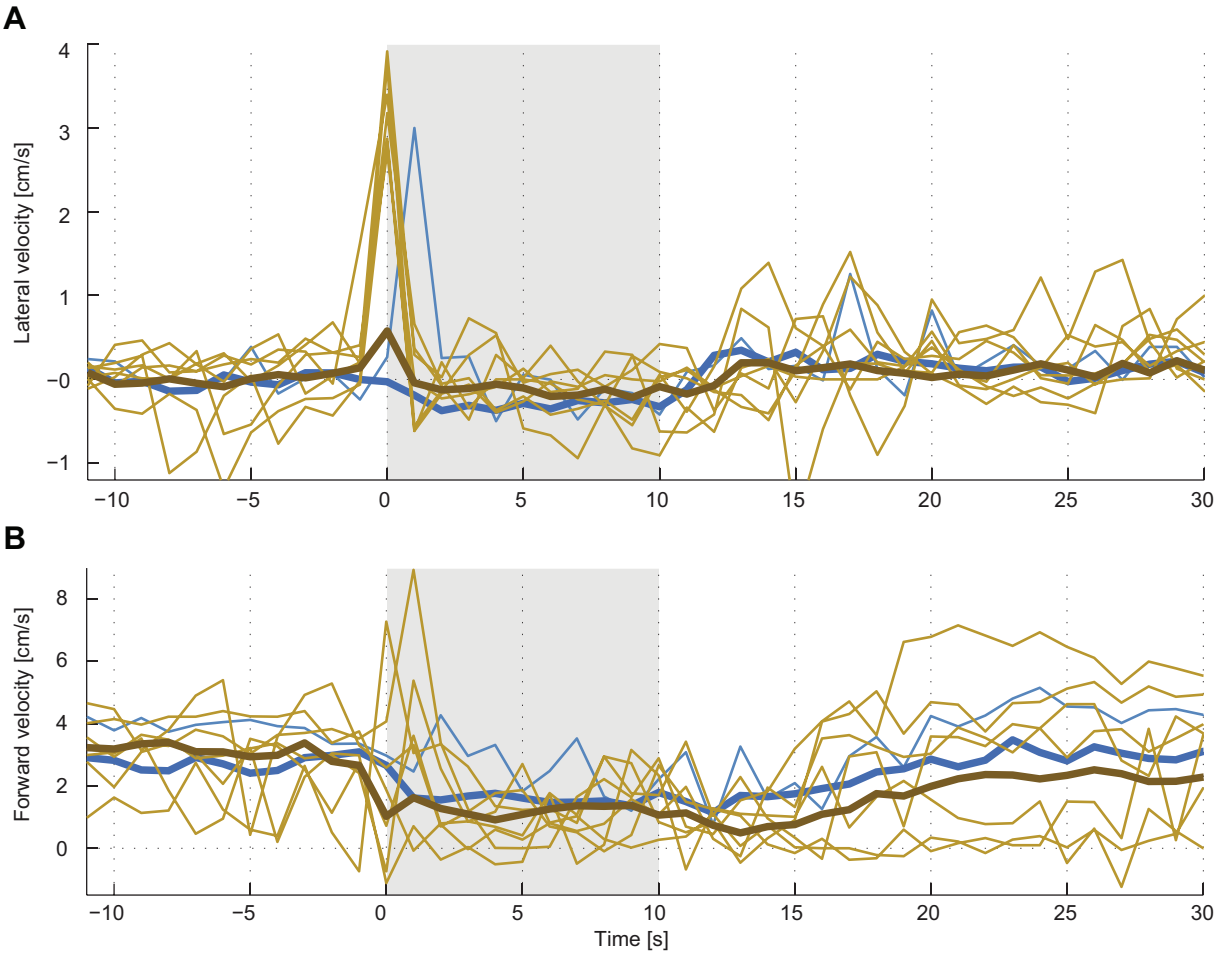


Figure S1: Fast 'escape-like' turns away from the approaching objects. Lateral velocity (A) and forward velocity (B) traces of the six *close* (ochre) and one *far* (blue) pure antennal stimulation trials where animals initially performed sharp turns away from the approaching object are shown as thin lines. As a reference, the median walking velocities computed from all *close* and *far* trials is plotted with thick lines. After the initial avoidance response, animals turned towards the object and explored it with their antenna. Grey shading marks the antennal stimulation period.

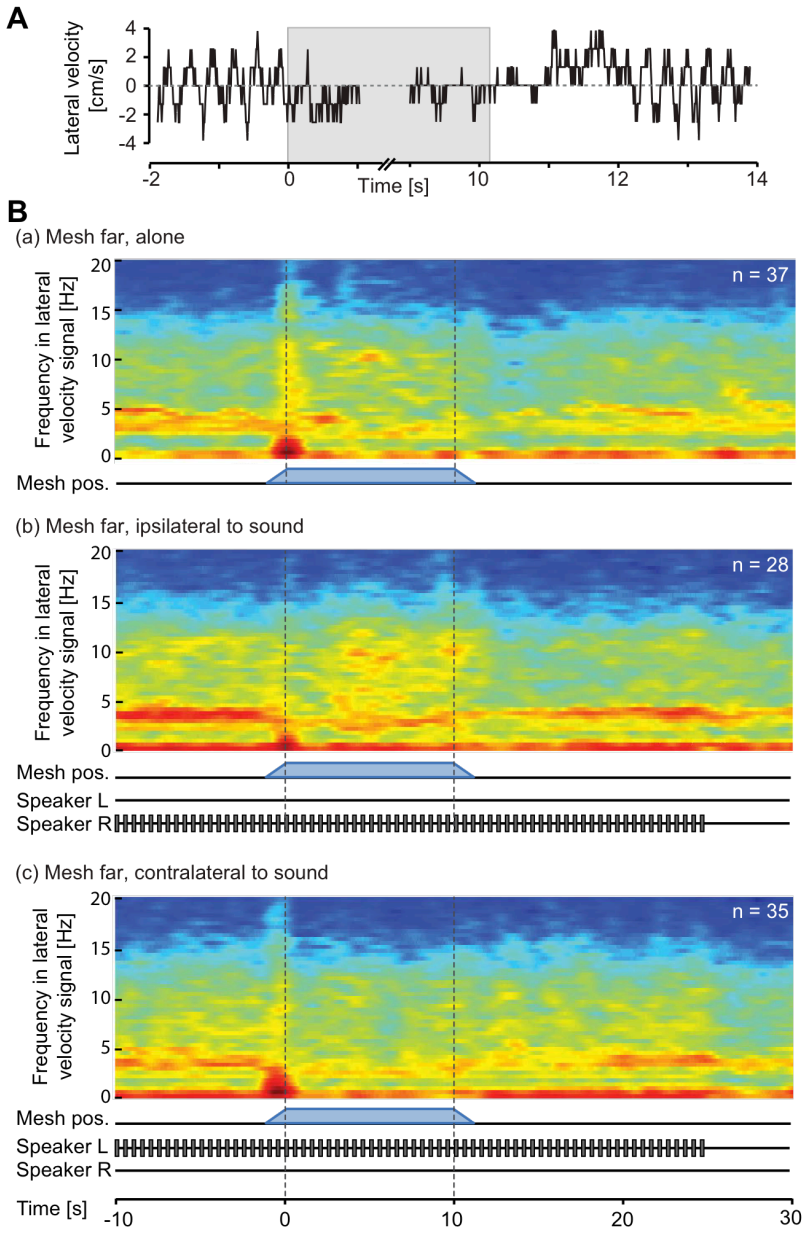
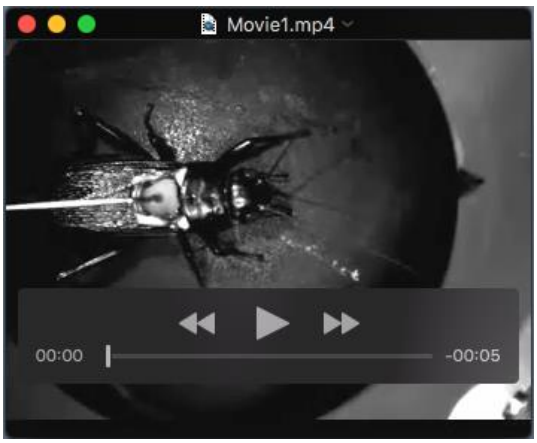


Figure S2: Disruption of the cricket's regular walking pattern during antennal stimulation. A: Regular oscillations in the raw steering velocity signal of a spontaneously walking cricket during a *far* antennal stimulation trial (same measurement as shown in Fig. 2C, top). Grey shading marks the antennal stimulation period. Similar oscillations were observed in the steering velocity signal during phonotaxis (not shown). B: Power spectrograms of the lateral velocity during *far* antennal stimulation trials. The velocity signal can be understood as a linear combination of oscillations and the contribution of oscillations of different frequencies to a measured signal can be visualised in a frequency power spectrogram. We computed spectrograms of the lateral velocity signal during pure antennal stimulation (a, n = 37, 20 animals) and during antennal stimulation with ipsilateral (b, n = 28, 15 animals) or contralateral (c, n = 35, 20 animals) acoustic stimulation. Spectrograms were computed for each trial and then averaged. During spontaneous walking and unperturbed phonotaxis, there is high power in a frequency band around 3-5 Hz. In all three experimental groups the power of this 3-5 Hz frequency band is reduced during, and to varying degrees after, antennal stimulation. Dashed lines mark the beginning and end of the antennal stimulation period and speaker traces indicate acoustic stimulation. Only spectrograms from *far* trials are shown, as they closely resemble those from *close* trials.



Movie 1. Response of a spontaneously walking female cricket to *far* antennal stimulation. Antennal stimulation begins after about 2 s, the cricket makes its first contact with the approaching mesh shortly after and starts to explore the mesh. The video was recorded at a 60 Hz frame rate and subsequently down-sampled as well as compressed for publication.

Movie 2. Response of a spontaneously walking female cricket to *close* antennal stimulation. The mesh begins to approach the cricket shortly after the video clip begins. The cricket makes its first antennal contact with the approaching mesh after about 2 s and displays an initial fast avoidance response. This transient response is followed by antennal exploration of the stationary mesh. The video was recorded at a 60 Hz frame rate and subsequently down-sampled as well as compressed for publication.

Movie 3. *Far* antennal stimulation during contralateral acoustic stimulation. The calling song is played to the cricket from the left as indicated by the light spots on the trackball, which indicate the timing of the sound pulses. Down-sampling the video made the temporal pattern of the light pulses occasionally appear irregular. Before antennal stimulation the cricket walks and steers towards the calling song. Upon *far* antennal stimulation, about 3 s after start of the video, the cricket turns towards the presented mesh. The video was recorded at a 60 Hz frame rate and subsequently down-sampled as well as compressed for publication.