

Auditory Object Normalisation

Initiative: Dynamik und Adaptivität neuronaler Systeme (beendet)

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Mammals have an extraordinary ability to identify auditory objects, like communication calls and speech. Echolocating mammals identify real, three-dimensional objects exclusively through the auditory analysis of echoes. Mammals reliably recognize auditory objects despite the variability of the sounds from one occurrence to the next. Much of the information about object shape and structure is represented in its impulse response, and much of the variability relates to the size of the sound source, e.g. a child vs. an adult, or, in echolocation, a small prey vs. a large prey of the same shape. For reliable object recognition, the auditory system must segregate information about object size from information about object structure. This results in a size-invariant object representation; the auditory object is normalised. As yet there is no proper understanding of the extraordinary ability of the mammalian auditory system which performs this procedure virtually automatically. This joint project focuses expertise from the full breadth of auditory neuroscience on auditory object normalisation. The experimental techniques range from psychophysics to brain imaging and electrophysiology; the results will supply the basis for a physiologically plausible computer model of auditory object recognition.

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