

UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

Computational Model of Spatial Auditory Attention in ACT-R

Permalink

<https://escholarship.org/uc/item/6hj8m2p9>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 40(0)

Authors

Scheuerman, Jaelle

Anderson, Maxwell T.

Venable, K. Brent

et al.

Publication Date

2018

Computational Model of Spatial Auditory Attention in ACT-R

Jaelle Scheuerman

Tulane University, New Orleans, Louisiana, United States

Maxwell T. Anderson

K. Brent Venable

Edward Golob

Abstract

We present an extension to the ACT-R audition module developed to support models of spatial auditory attention. This extension adds support for spatial sounds and models a gradient of spatial auditory attention over 180 in the frontal horizontal plane. This spatial gradient represents the attentional bias created from interaction between top-down (goal driven) attention and bottom-up (salient) attention, represented by a Gaussian and inverse Gaussian curve respectively. Response time to a sound is modeled using a calculated attentional bias, affected by the current goal location and the sound location. This ACT-R extension is used to model a behavioral task where subjects were told to attend to a spatial location and respond to sounds at attended and distractor locations. By incorporating this model into ACT-R, we will gain insights into the interaction between spatial auditory attention and other other cognitive processes, such as learning and memory.