

A Unified Quantitative Model of Vision and Audition

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Abstract

We have put forwards a unified quantitative framework of vision and audition, based on existing data and theories. According to this model, the retina is a feedforward network self-adaptive to inputs in a specific period. After fully grown, cells become specialized detectors based on statistics of stimulus history. This model has provided explanations for perception mechanisms of colour, shape, depth and motion. Moreover, based on this ground we have put forwards a bold conjecture that single ear can detect sound's direction. This is complementary to existing theories and has provided better explanations for sound localization.

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Keywords: perception mechanisms, encoding model, vision, sound location

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