

Paired Recording Reveals Temporal Decorrelation of Retinal Inputs in the Thalamus

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It has been proposed that the lateral geniculate nucleus (LGN) of thalamus temporally decorrelates the retinal inputs during natural viewing to achieve efficient coding (Dong and Atick, 1995, Truccolo and Dong 2001). To directly assess this potential role of thalamus, we made paired recordings of LGN neurons and their apparent corresponding retinal inputs (S-potentials), in awake cats free-viewing natural time-varying images. We derived the retina-LGN transfer function from the measured LGN input and LGN output. We found that the function is indeed a temporal difference filter, the LGN output is more decorrelated than the LGN input, and LGN contains much less information about saccade timing than the retina.

The results are consistent with the prediction of the theory of efficient coding.

Acknowledgments

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References

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