Using Tweedie distributions for fitting spike count data.

By esc_admin
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Moshitch, D, Nelken I. 2014.

Abstract:

The nature of spike count distributions is of great practical concern for the analysis of neural data. These distributions often have a tendency for 'failures' and a long tail of large counts, and may show a strong dependence of variance on the mean. Furthermore, spike count distributions often show multiplicative rather than additive effects of covariates. We analyzed the responses of neurons in primary auditory cortex to transposed stimuli as a function of interaural time differences (ITD). In more than half of the cases, the variance of neuronal responses showed a supralinear dependence on the mean spike count.

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