



Talks by rising stars of neuroscience

Feature selectivity can explain mismatch signals in mouse visual cortex

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Sensory experience often depends on one's own actions, including self-motion. Theories of predictive coding postulate that actions are regulated by calculating prediction error, which is the difference between sensory experience and expectation based on self-generated actions. Signals consistent with prediction error have been reported in mouse visual cortex (V1) when visual flow coupled to running was unexpectedly stopped. Here, we show such signals can be elicited by visual stimuli uncoupled to animal's running. We recorded V1 neurons while presenting drifting gratings that unexpectedly stopped. We found strong responses to visual perturbations, which were enhanced during running. Perturbation responses were strongest in the preferred orientation of individual neurons and perturbation responsive neurons were more likely to prefer slow visual speeds. Our results indicate that prediction error signals can be explained by the convergence of known motor and sensory signals, providing a purely sensory and motor explanation for purported mismatch signals.

Event link:

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