Response time course and magnitude are both modulated by attention in monkey V4

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Single Unit Example

Neuronal response is modulated by cueing, we conduct a between-subjects, unilateral analysis on a log scale is consistent with subsequent stimulus flash. To compare these effects with the cueing, we conduct an ANOVA below:

Methods

We recorded from single units in V4 while monkeys perform a cued target detection task. Two standing gratings are used as visual stimuli and are flashed in an appearance/disappearance fashion with a square-wave temporal profile. The monkey must maintain central fixation and release a bar to indicate that one of the two gratings has increased in contrast. Trials are blocked according to which grating is most likely to step in contrast, and the fixation point color indicates the cued direction (cue is valid on 90-95% of trials).

Target

Cue

Stimulus

Bar Touch

Fixation Point

The behavioral task was controlled by a computer running TEMPO (Reflective Computing) under MSDOS 6.22 (Microsoft). Stimuli were presented by a VSG 2/3 (Cambridge Research) at 90Hz refresh on a 20 inch Sony CRT monitor positioned 57 cms from the monkey’s eyes. Eye position was monitored by an IR video eye tracking system (ALS) operating at 120 Hz.

Neural activity was recorded using monopolar tungsten electrodes (FHC) referenced to a titanium strip secured by a slurry screw in the implant. Rapid taping was conducted with holo-discriminated spikes, and an attempt was made to maximize the driving of a single neuron. Neural data together with lighting pulses were continuously streamed to disk at 20kHz for offline analysis.

Conclusions

Attention influences the power in the F1 and F2 responses even more than the mean rate

Single units in V4 can show shifts in dynamics that are analogous to changes in contrast

References


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