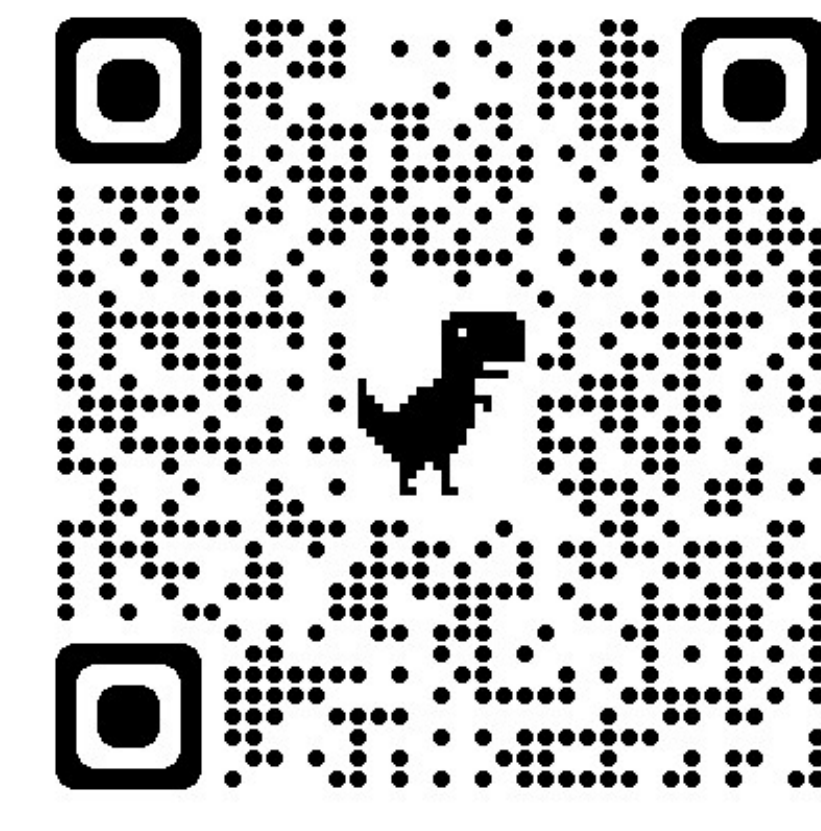


Gaze and visual short-term memory for localizing image parts

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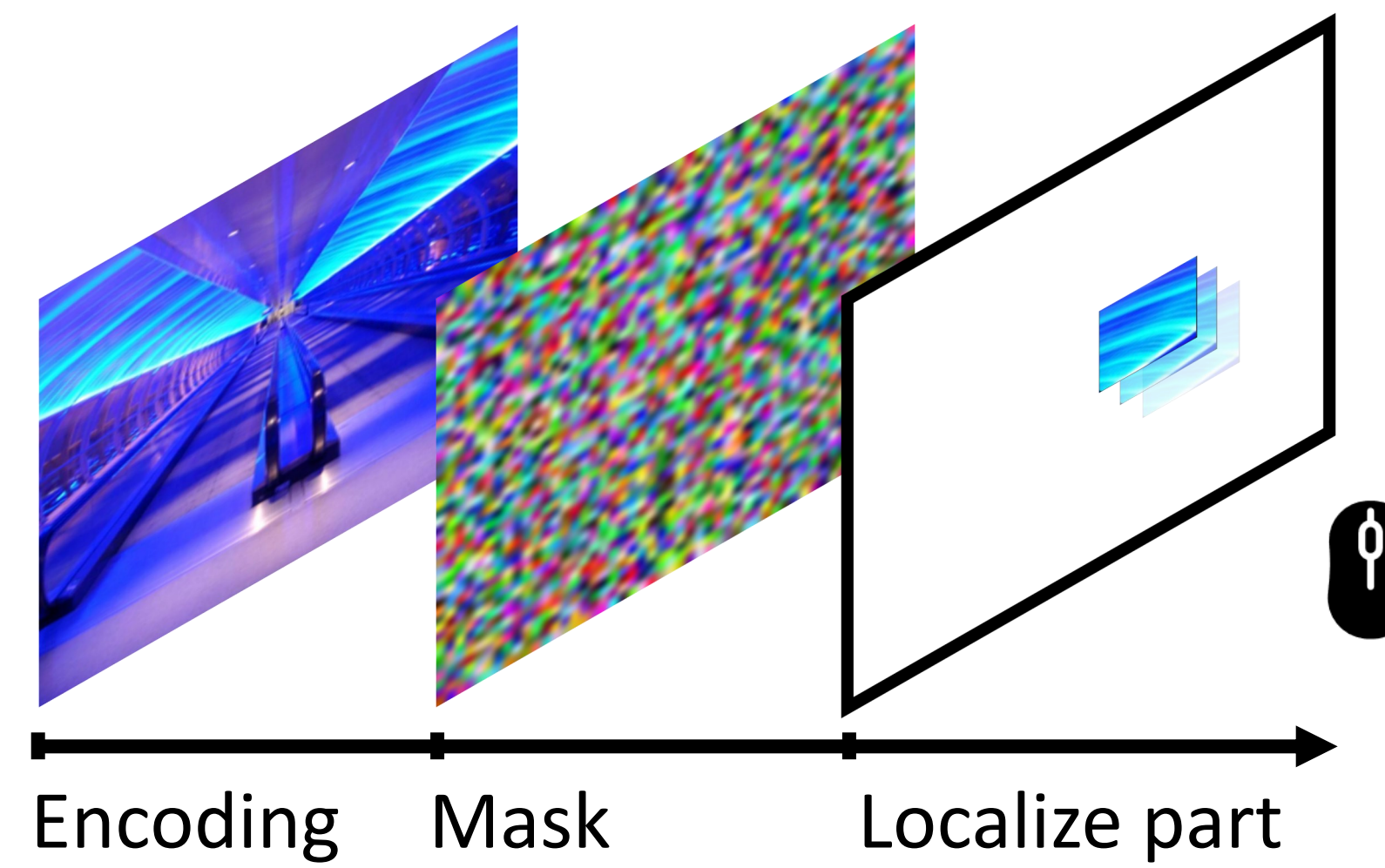
There is a complex relationship between the number of fixations one makes in exploring a natural image and recognition memory [1]. What is the cause of this relationship? We introduce a novel image-part localization task that allows us to investigate in more detail the contribution of each fixation to short-term memory.

Task

Localization of part (1/5 scale) of an image (15 x 15 deg) presented for 8 s. 168 images from the SUN database [2].

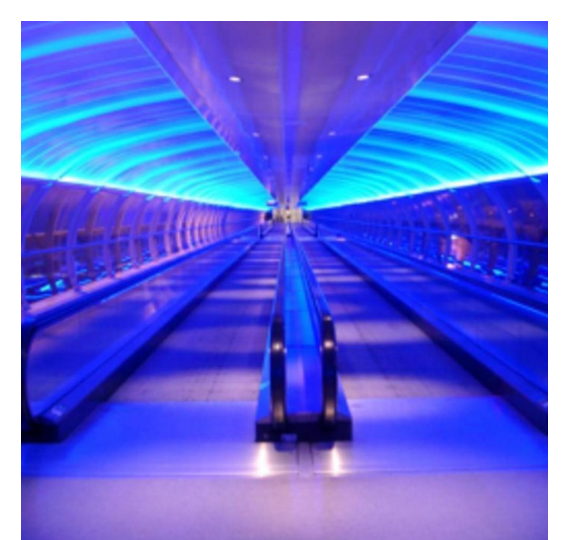
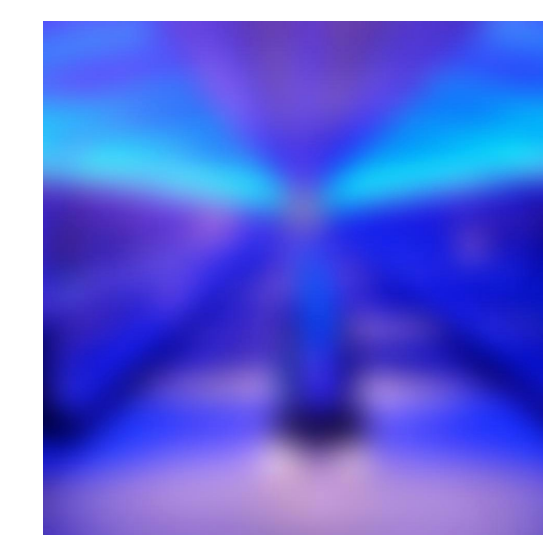
Conditions

Unblurred (N = 19)
Blurred (N = 21)
Recognition task (N=19)
Unblurred. Old-new judgement at the end



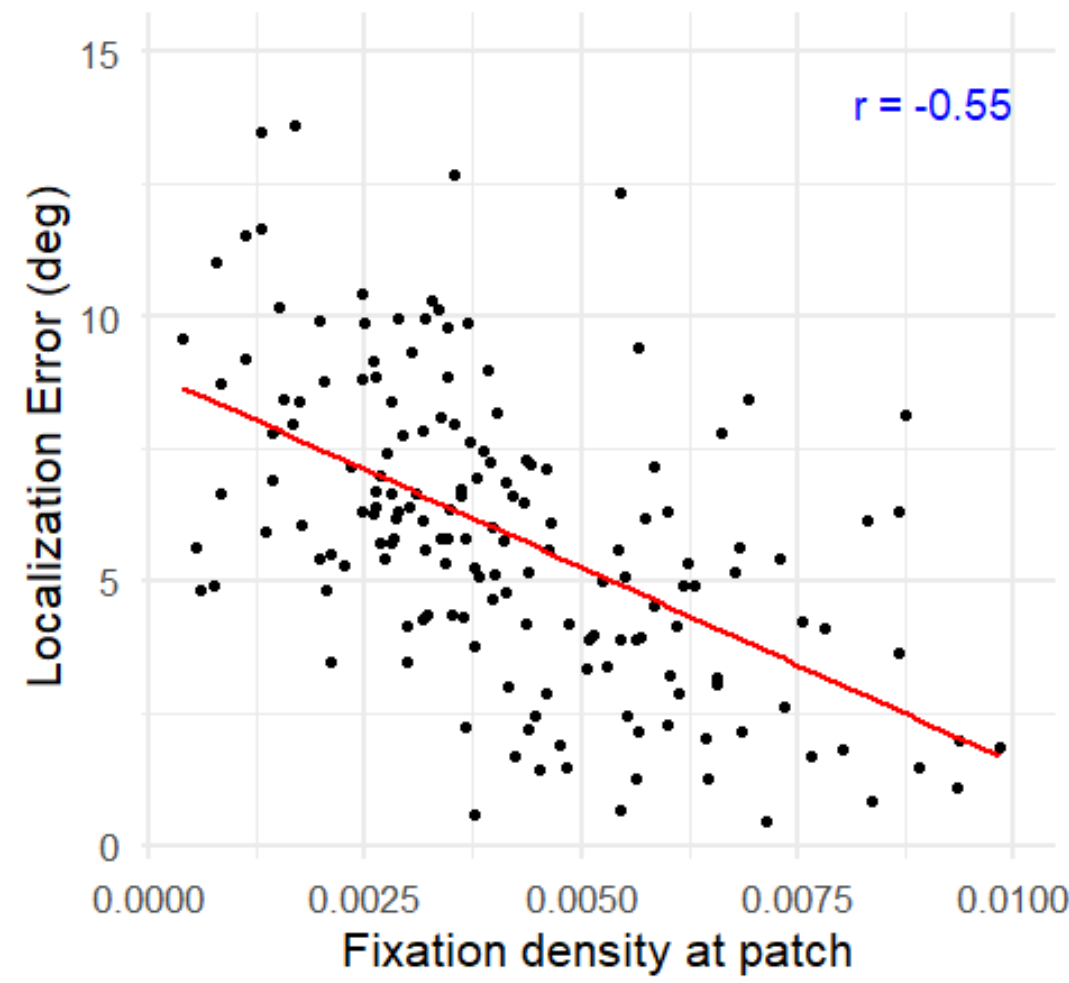
Blurred

Unblurred

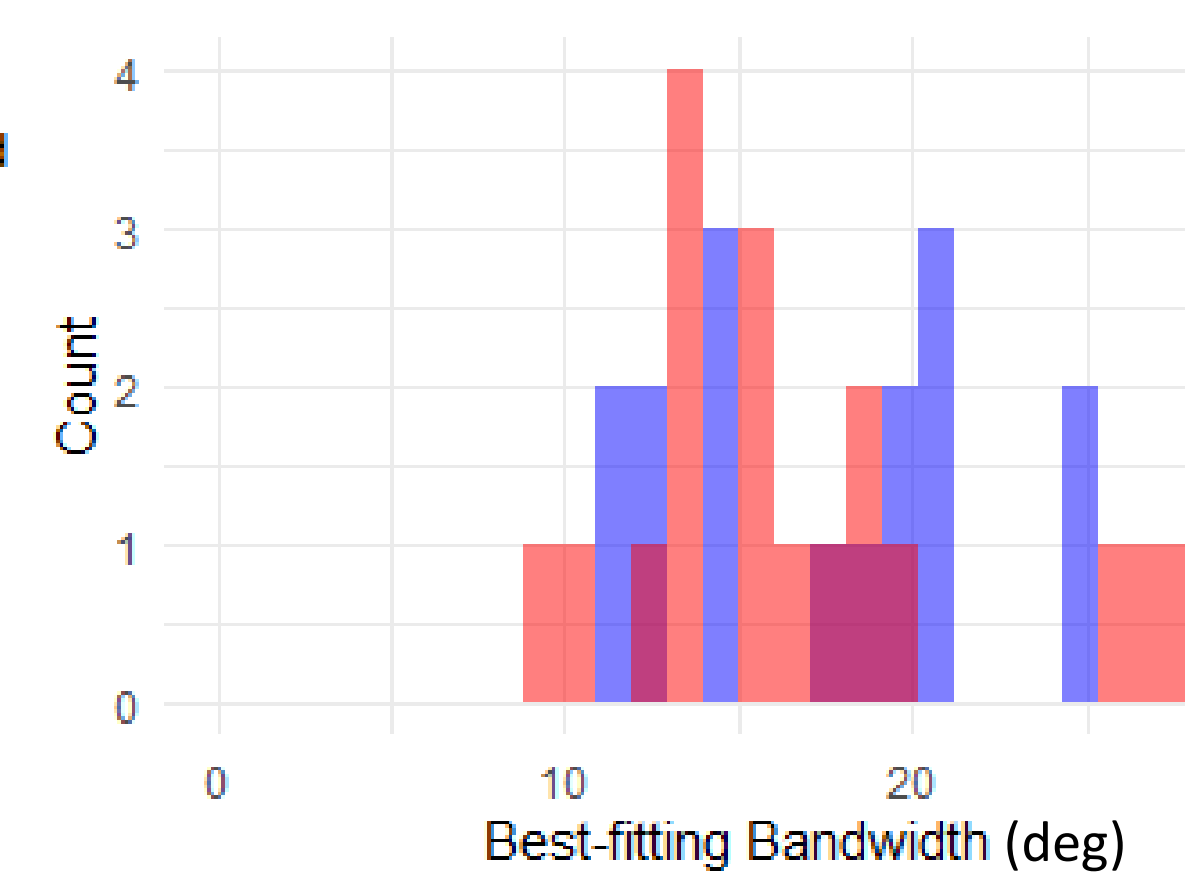
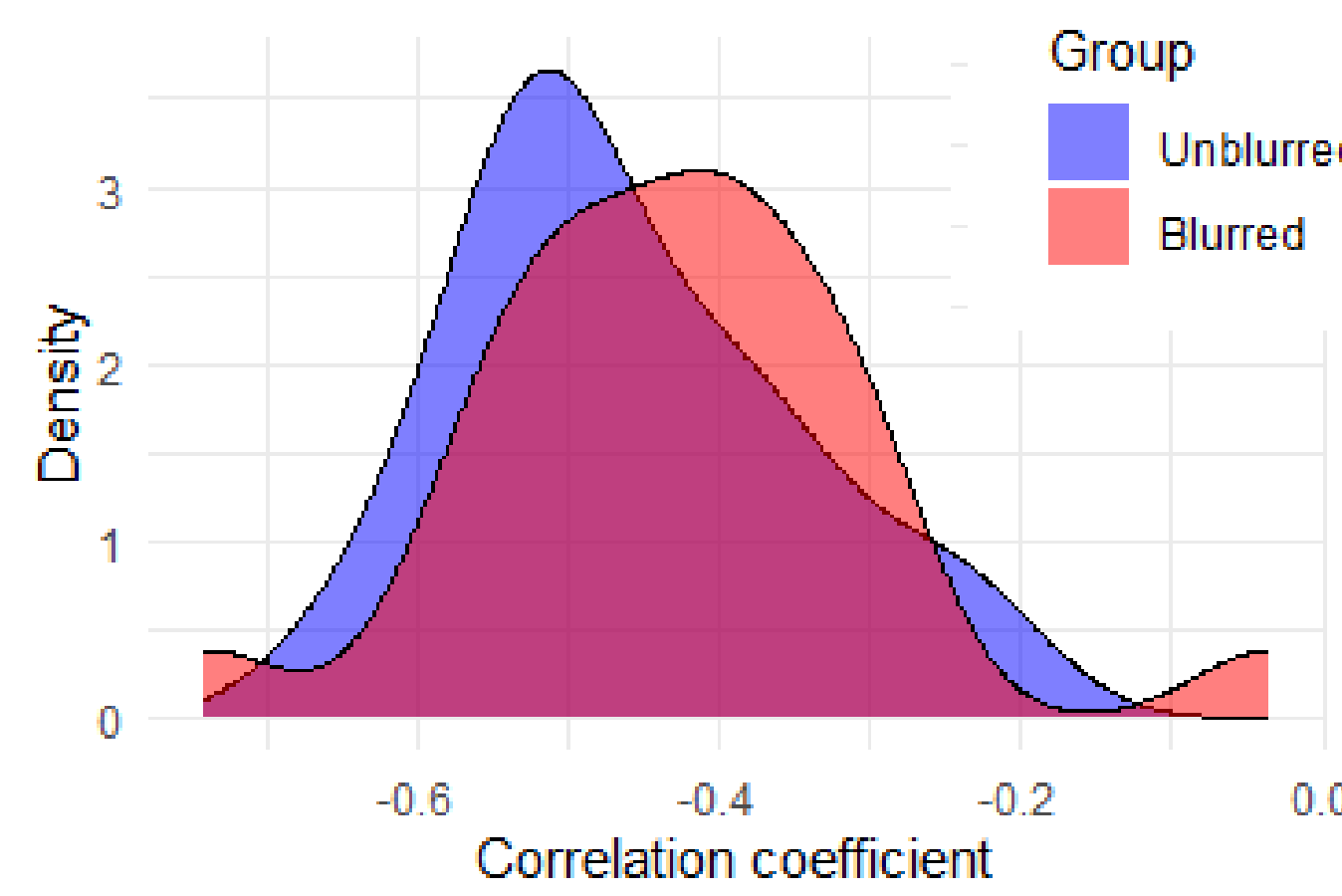


Results

Example individual
Localization error for each image vs fixation density at patch location estimated by best-fitting gaussian kernel bandwidth

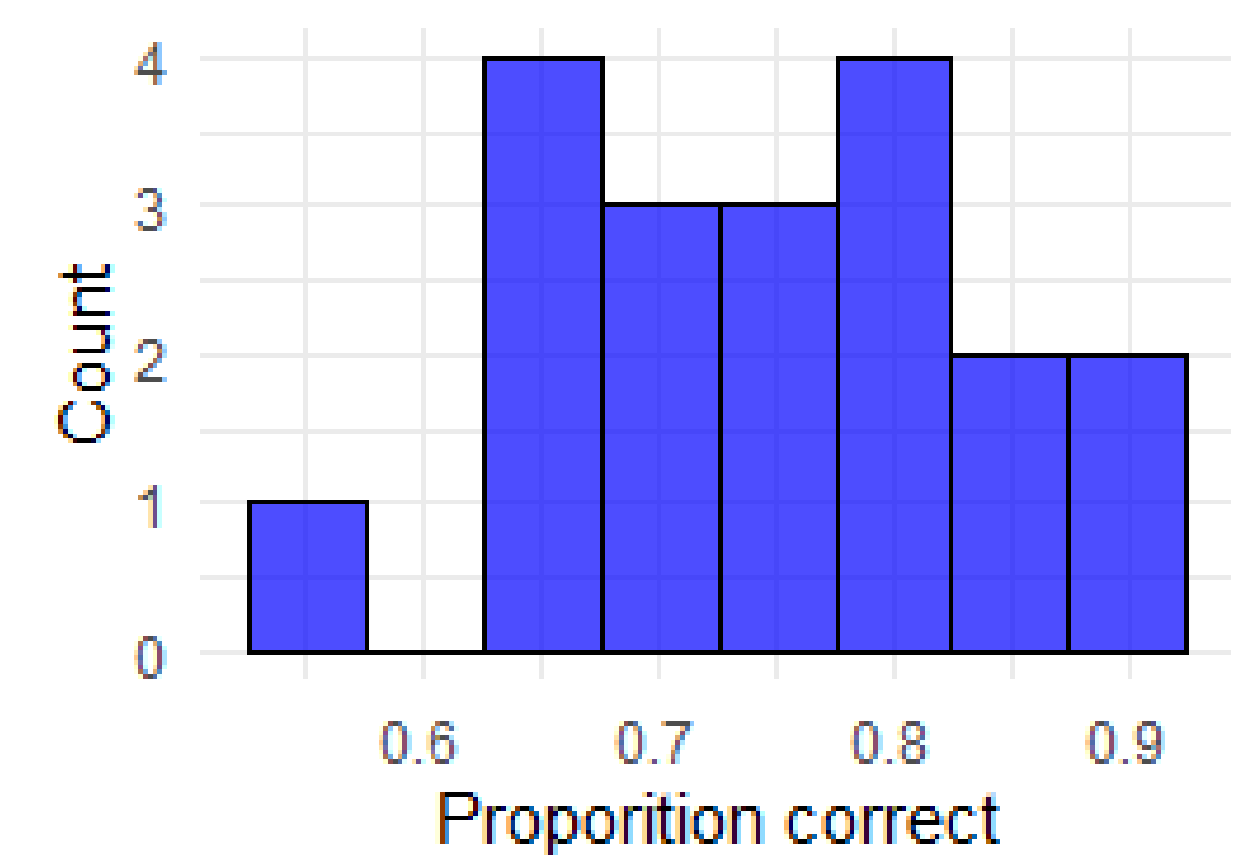


Group : Fixation density and localization error

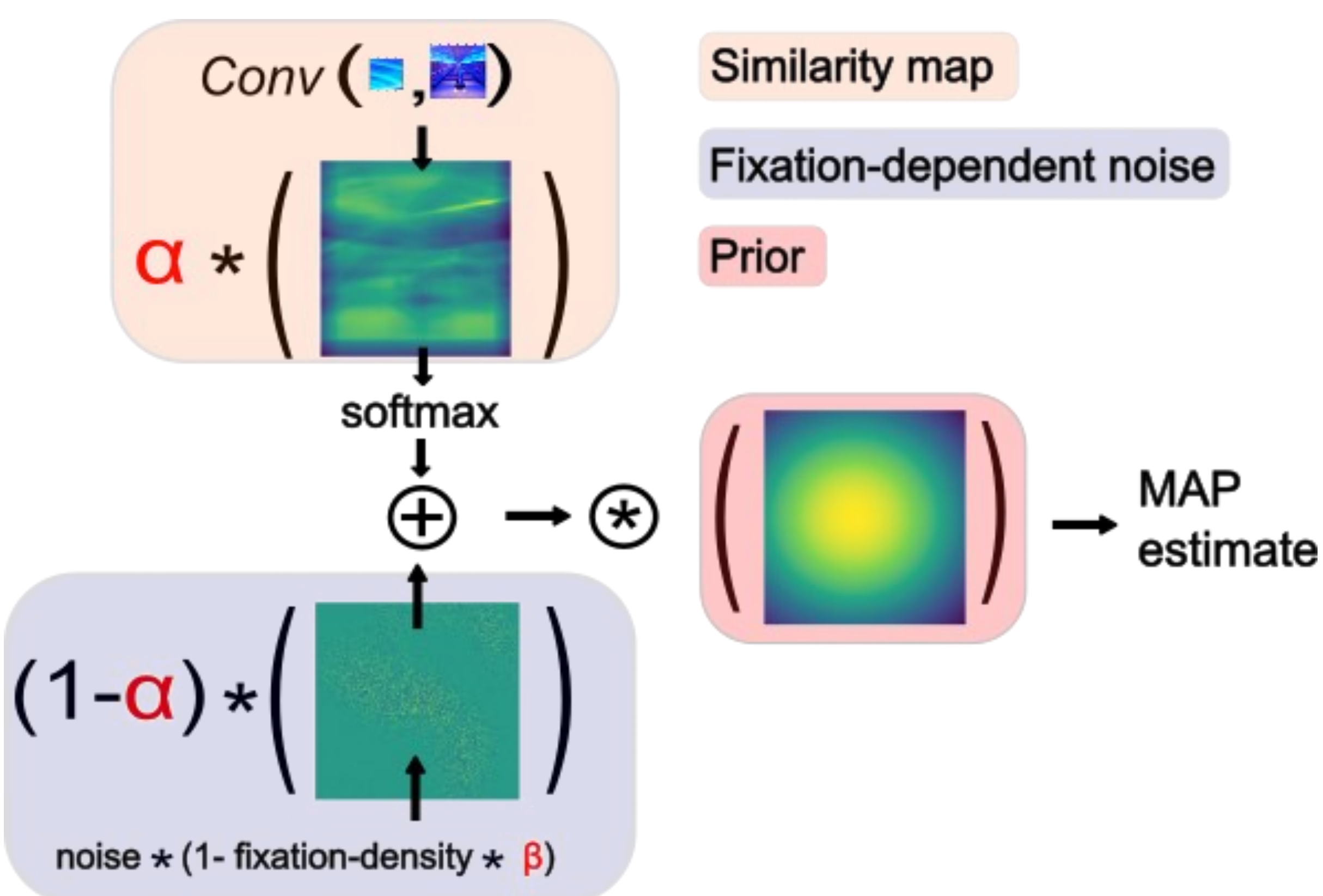


Recognition

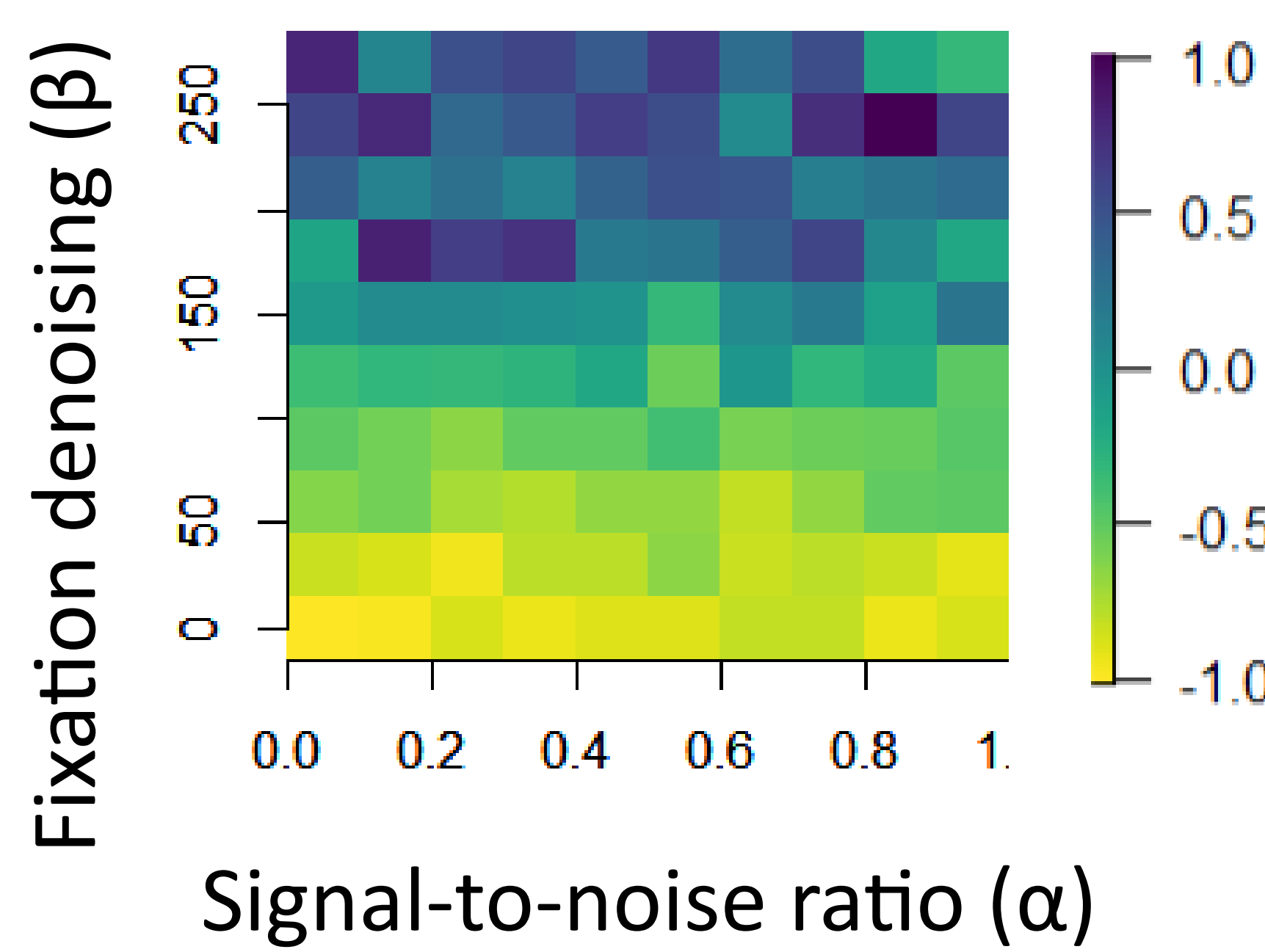
Unblurred encoding



Localization model



Correlation between density and localization error



Localization error and number of fixations ($\beta=100, \alpha = .5$)

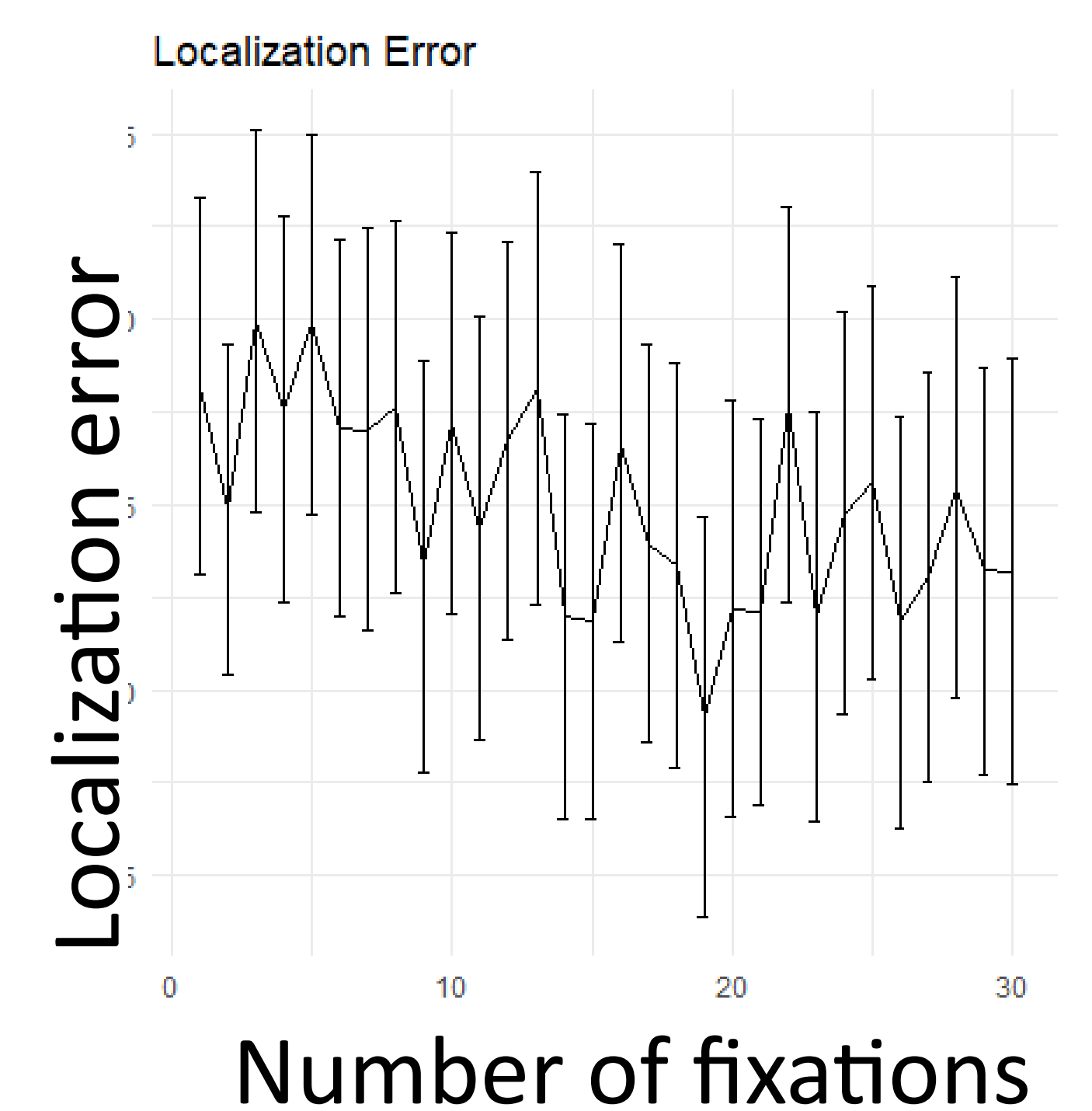


Image-part localization (IPL) depends on where people fixate, and relies partly on high spatial frequency information.

A Bayesian localization model could account for the influence of fixations on memory for natural scenes, expanding on Bayesian accounts of localization with simple stimuli [3].

References

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