

It has been shown that not all fixated locations in a scene are encoded in visual memory. We propose a new way to probe experimentally whether the scene content corresponding to a fixation was considered important by the observer. Our protocol is based on findings from mental imagery showing that fixation locations are reenacted during recall. We track observers' eye movements during stimulus presentation and subsequently, observers are asked to recall the visual content while looking at a neutral background. The tracked gaze locations from the two conditions are aligned using a novel elastic matching algorithm. Motivated by the hypothesis that visual content is recalled only if it has been encoded, we filter fixations from the presentation phase based on fixation locations from recall. The resulting density maps encode fixated scene elements that observers remembered, indicating importance of scene elements. We find that these maps contain top-down rather than bottom-up features.