

What makes an object memorable?

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Abstract

Recent work by Isola et. al. (2011) has demonstrated that memorability is an intrinsic property of images that is consistent across viewers and can be predicted accurately with current computer vision techniques. Despite progress, a clear understanding of the specific components of an image that drive memorability are still unknown. While previous studies such as Khosla et. al. (2012) have tried to investigate computationally the memorability of image regions within individual images, no behavioral study has systematically explored which memorability of image regions. Here we study which region from an image is memorable or forgettable. Using a large image database, we obtained the memorability scores of the different visual regions present in every image. In our task, participants viewed a series of images, each of which were displayed for 1.4 seconds. After the sequence was complete, participants similarly viewed a series of image regions and were asked to indicate whether each region was seen in the earlier sequence of full images.

1. Introduction

Consider the image and it's objects in Figure 1. Even though the person on the right is comparable in size to the left person, he is remembered far less by humans (indicated by their memorability scores of 0.18 and 0.64 respectively). Many humans tend to remember the fish in the center and the person on the left even after a 30 minute duration (memorability score = 0.64). Interestingly, despite covering a large portion of the image, the boat is also remembered far less by humans (memorability = 0.18).

While recent studies related to image memorability have shed light on the large differences that exist between the memorabilities of different images, and the intrinsic and extrinsic properties that make an image memorable, the above example raises an interesting question: what exactly about an image is remembered? Need to highlight why this will be important to study for a computer vision standpoint and memorability literature viewpoint. Maybe point that image

memorability is an interesting problem, can be predicted by comp vis algos, has applicability such as modifying of photographs based on memorability. The example in Figure 1 suggests that there exists significant and interesting differences in memorability of objects in an image previously not studied in the literature. knowing about object memorability can lead to a clear understanding of the specific components of an image that drive memorability is still unknown.

In this paper, we systematically explore the memorability of objects within individual images and shed light on the various factors and properties that drive object memorability.

Despite progress in the computer vision literature on image memorability, a clear understanding of the specific components of an image that drive memorability is still unknown.

Firstly, our work explores if object memorability is a property shared across subjects and answers - can specific objects inside an image can be memorable to all of us? Next, I want to quantify which objects in general are most memorable and which ones are least memorable. This could lead to interesting questions like if an image contains highly memorable objects, could it's memorability still be low? Another way would be think can an image still be memorable even if the objects inside it have low memorability? Not only am I curious about this question, I believe that this will be very beneficial for object detection algorithms. For example, classes like person, dogs are easy to detect for current state-of-the-art computer vision algorithms but objects like chairs, bottles are very hard to detect. Could there be a correlation between the two? Are classes like chair and bottles tough to detect because these objects are less memorable? If there is, then object detection algorithms could use memorability as one of the features to improve the detection performance in future. Lastly, I want to study the correlation between salient objects and memorable objects. Are objects that are more salient, easier to memorize as well? Finding the overlap and differences between saliency and memorability would go a long way to help object detection algorithms.

Can specific objects inside an image be memorable to all

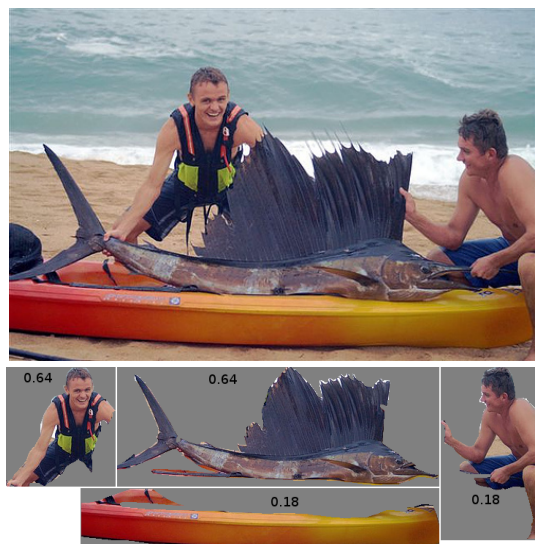


Figure 1: **Memorability of different objects.** Memorability scores of objects for the image in the top row obtained from our pysophysics experiment.

of us and can we better understand the properties that drive object memorability within individual images?

no study has systematically explored memorability of objects within individual images. Inspired by this, here, we are not just interested in understanding image memorability, we are interested in understanding memorability of objects in an image. Can some objects in individual images be more memorable to us and can we estimate their predictability? And how exactly do different objects matter, whether it be size, spatial arrangement, etc.

References