Large scale attention based saliency detection from images of multiple objects: Top-down/Bottom-up or combination

Computer Vision (CS6350)

TPA - 10

Problem Statement: The aim of salient object detection is to identify the most visually distinctive object in an image. Image saliency detection can be approached by bottom-up models, top-down models or an integration of both bottom up and top down models [1]. Bottom-up models are stimulus driven and focus on exploring low-level vision features. Whereas, top-down models are task-driven and utilize supervised learning with labels[2]. In this project, given an image, locate the salient object(s) in the image.

Input: An Image.

Expected Output: Locate salient object(s) in the image.

Dataset:

- **CAT2000** [3]: Images of this dataset consists of 2000 training images and 2000 test images spanning 20 different categories such as Cartoons, Art, Satellite, Low resolution images, Indoor, Outdoor, Line drawings, etc.
- **SALICON [4]:** It is currently the largest crowd-sourced saliency dataset. Images of this dataset come from the Microsoft COCO dataset. The SALICON contains 10000 training images, 5000 validation images and 5000 test images

References:

[1] H. Peng, B. Li, R. Ji, W. Hu, W. Xiong, C. Lang: Salient object detection via low-rank and structured sparse matrix decomposition. IEEE Transactions on Pattern Analysis and Machine Intelligence, 39 (4), 818 – 832 (2017).

[2] Junting Pan, Cristian Canton, Kevin McGuinness, Noel E. O'Connor, Jordi Torres, Elisa Sayrol and Xavier Giro-i-Nieto. "SalGAN: Visual Saliency Prediction with Generative Adversarial Networks." arXiv. 2017.

[3] A Borji, L Itti, "CAT2000: A large scale fixation dataset for boosting saliency research" IEEE Conference on Computer Vision and Pattern Recognition workshop on "Future of Datasets", 2015. http://saliency.mit.edu/datasets.html

[4] M. Jiang, S. Huang, J. Duan, and Q. Zhao, "Salicon: Saliency in context," Computer Vision and Pattern Recognition (CVPR), 2015, pp. 1072–1080. http://salicon.net/download/