**MAKERERE UNIVERSITY**

COLLEGE OF COMPUTING AND INFORMATION SCIENCES

DEPARTMENT OF NETWORKS

BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING (YEAR 2)

RECESS TERM 2 (BSE 2301)

CONCEPT PAPER FOR:

**MULTI SALIENT OBJECT ANALYSIS PROJECT**

**PROJECT MEMBERS (GROUP 12)**

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**Introduction.**

Salient object detection has been attracting a lot of interest, and recently various heuristic computational models have been designed. We propose a multi salient object subitization model for classifying and categorizing images based on the number of salient objects they contain.

**Background to the problem.**

Images appearing on websites, mobile devices, as well as TVs and computer screens enrich our daily life. However, processing such large amount of visual information in images in short time is a difficult task. Information in images differs in importance. Some are crucial while others are negligible. An automatic and selective mechanism that answers which information is necessary to pick up from an image for further analysis can be useful. A feasible way is by the selective mechanism of human visual attention. According to studies of neurobiology and cognitive psychology, human brains are capable of selecting a certain subset of visual information for further processing. Modeling human visual attention on images is referred to as saliency detection **[1],** which aims at detecting salient image parts that can easily attract human attention. This saliency detection is stimulus-driven as well as widely studied in the past decade. Saliency detection results indicating potential regions of interest (ROI) provide some guidance to further analysis. This has been used in many applications, e.g. object detection and recognition, image compression, video summarization, content based image editing and image retrieval **[2].** In the last decade, saliency detection has become a research field in computer vision attracting much attention. It is originally a task of predicting the eye-fixations on images, and recently has been extended to identifying a region containing the salient object.

**The problem this project will address.**

One of the fundamental challenge in salient object detection is to uniformly emphasize desired objects and ignore irrelevant background.

This project focuses on salient region/object subitization in natural images. The aim is to generate high quality saliency model that predicts the existence and number of salient objects in a scene using holistic cues.

**The specific objectives this project will achieve.**

The objectives of the project are:

To develop a model that enhance salient objects detection uniformly meanwhile suppress irrelevant background.

To train the model to recognize image inputs

To train the model to differentiate between salient parts and irrelevant background parts of the image.

**The anticipated outcomes resulting from this research/project.**

The anticipated outcome of this project is a salient object subitization model that predicts the existence and number of salient objects on a scene using holistic cues.

The model will be able to categorize the images according to the number of salient objects they contain.

**The methodology to be used to accomplish the above objectives.**

The methodology for the proposed model is region level analysis which involves dividing an image into regions. Decomposing an image into perceptually homogeneous elements helps to abstract out unnecessary details which is important for high quality saliency detection **[3].** We shall use the MSO dataset which is a subset of the SOS datasets originating from four public image datasets including COCO, VOC07, ImageNet and SUN to develop and test the model.

**References:**

[1] K.F Keren Enhancement of Salient Image Region for Visual Object Detection. Chalmers

Reproservice, Goteborg, Sweden, November 2014.

[2] J Hunaizu, Y. Zejian and S Li, Salient Object Detection: A Discriminative Regional

Feature Integration Approach.,2011.

[3] A. Borgi, M.M. Cheng, Salient Object detection: A survey. In CVPR, 2017.