DISSERTATION INFORMATION

Title: **DEVELOPMENT OF SALIENCY REGION MODEL FOR MEDICAL IMAGE SEGMENTATION**

Major: **COMPUTER SCIENCE**

Major code: **9480101**

PhD candidate: **VO THI HONG TUYET**

ADVISORS: **ASSOC.PROF. DR. NGUYEN THANH BINH**

University: **HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY, VNU - HCMC**

CONTENT

Medical image segmentation is an important problem in computer vision, with many practical applications. Objects in medical images contain a wide range of useful information, but usefulness is easily lost because the scope of the object contains many detailed pixels. Therefore, the multilevel in segmentation is extremely necessary. The salient map is one of the approaches which improve the accuracy of segmentation. However, the big problem is identifying the parameters for level calculating for salient maps and their influences for segmentation. The research aim of the thesis is the development of saliency prediction for medical segmentation. Two key issues are posed as the key to the research process, including:

(i) Firstly, the salient map is determined based on what parameters and criteria?;

(ii) Secondly, how to improve the saliency method for the support in a smart medical system?

From these two issues, the goal of the thesis is set to solve the above including:

(i) Criteria to identify saliency on medical images;

(ii) Improve feature map by deep feature map for the automated medical segmentation systems.

The proposed method of the thesis is based on the principle of three processing models: *mathematical calculation model, computer vision processing model and machine learning/deep learning model*. By flexibly combining these models, the thesis has proposed two main research directions to solve the aim: *using salient map as input for the feature extraction model and using feature maps for saliency prediction*.

Thesis has done four main contributions to follow the thesis's aim: identify the number of parameters to choose the salient map; adapt a multilevel deep learning model for improving the saliency results; enhance and optimize features map for saliency prediction; and develop the automatic segmentation system based on salient map. The experiments had given spectacular results.

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<tr><td align="center">**Advisors**</td><td align="center">**Ph.D. candidate**</td></tr>
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