THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

PHD STUDENT SEMINAR

Elastic Interaction-Based Loss Function in Image segmentation and detection

By

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Abstract

Deep learning techniques have shown success in image processing area since their strong capability on extracting features and patterns from large amount of data. The commonly used pixel-wise loss functions result in a bottleneck to achieve high segmentation precision for complicated geometry structures, e.g. long-thin or multi-scale objects. For instance, under the supervision of the pixel-wise losses, the predicted thin blood vessels in retinal images are often disconnected or even missed, and the detected lanes in diverse and complex driving scenes such as crowded environment or bad illumination are likely to be blurry. We propose a topology-aware deep training strategy to address these problems. In our approach, the neural network learns the target region under the guidance of the elastic interaction energy between the predicted boundaries and the ground truth. When the energy reaches to the minimum, the prediction will shrink to the correct position. Our method significantly improves the segmentation of geometrically complex objects.

> **Date** : **11 June 2024 (Tuesday)**
> **Time** : **10:00am**
> **Venue** : **Room 2463 (Lifts 25/26)**

All are Welcome!