THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Department of Computing
電子計算學系

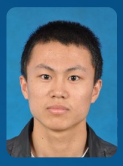
COMP RESEARCH STUDENT SEMINAR

Date : 7 June 2023 (Wed)
Time : 2:30 pm - 3:30 pm
Venue : N003 (Face-to-face)

Bounding the Response Time of DAG Tasks Using Long Paths

Abstract

In 1969, Graham developed a well-known response time bound for a DAG task using the total workload and the longest path of the DAG, which has been widely applied to solve many scheduling and analysis problems of DAG-based task systems. This work presents a new response time bound for a DAG task using the total workload and the lengths of multiple long paths of the DAG, instead of the longest path in Graham's bound. Our new bound theoretically dominates and empirically outperforms Graham's bound. We further extend the proposed approach to multi-DAG task systems. Our schedulability test theoretically dominates federated scheduling and outperforms the state-of-the-art by a considerable margin.



Mr Qingqiang HE
PhD candidate
Department of Computing

About the Speaker

Qingqiang He received the B.S. and the M.S. degree from Northeastern University, China, in 2014 and 2017, respectively. He is expected to receive his Ph.D. degree in 2023 from Department of Computing, The Hong Kong Polytechnic University, under the supervision of Dr. Mingsong Lv and Dr. Nan Guan. Currently he is a research assistant in The Hong Kong Polytechnic University. His research interests include real-time scheduling theory and embedded real-time systems. He received the Outstanding Paper Award of IEEE Real-Time Systems Symposium (RTSS) in 2022.

Promising or Elusive? Unsupervised Object Segmentation from Real-world Single Images

Ms Yafei YANG
PhD candidate
Department of Computing

About the Speaker

Yafei Yang received her bachelor's degree in Computer Science and Finance from The University of Hong Kong in 2020. She is now a Ph.D. student at the Department of Computing at The Hong Kong Polytechnic University, under the supervision of Dr. Bo Yang. Her research interest focuses on object-centric learning in computer vision, including object segmentation, unsupervised learning, object representation learning.

Abstract

In this paper, we study the problem of unsupervised object segmentation from single images. We do not introduce a new algorithm, but systematically investigate the effectiveness of existing unsupervised models on challenging real-world images. We firstly introduce four complexity factors to quantitatively measure the distributions of object-and scene-level biases in appearance and geometry for datasets with human annotations. With the aid of these factors, we empirically find that, not surprisingly, existing unsupervised models catastrophically fail to segment generic objects in real-world images, although they can easily achieve excellent performance on numerous simple synthetic datasets, due to the vast gap in objectness biases between synthetic and real images. By conducting extensive experiments on multiple groups of ablated real-world datasets, we ultimately find that the key factors underlying the colossal failure of existing unsupervised models on real-world images are the challenging distributions of object- and scene-level biases in appearance and geometry. Because of this, the inductive biases introduced in existing unsupervised models can hardly capture the diverse object distributions. Our research results suggest that future work should exploit more explicit objectness biases in the network design.