SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COLLEGE OF DESIGN AND ENGINEERING
Website: https://cde.nus.edu.sg/ece

Area: Control, Intelligent Systems & Robotics

Host: Assoc Prof Prahlad Vadakkepat

TOPIC	**:**	**Incremental Few-Shot Learning via Implanting and Compressing**
SPEAKER	**:**	**Mr Li Yiting** **Graduate Student, ECE Dept, NUS**
DATE	**:**	**Tuesday, 12 April 2022**
TIME	**:**	**11.00AM to 11.30AM**
WEBINAR	**:**	**Join Zoom Meeting** **https://us05web.zoom.us/j/4834304967?pwd=bTZwUlh6Z2Y0RFNpbjRLVE1UZEsrUT09** **Meeting ID: 483 430 4967** **Passcode: FQ1h8H**

ABSTRACT

We focus on tackling the challenging but realistic visual task of Incremental Few-Shot Learning (IFSL), which requires a model to continually learn novel classes from only a few examples while not forgetting the base classes on which it was pre-trained. Our study reveals that the challenges of IFSL lie in both inter-class separation and novel-class representation. Due to intra-class variation, a novel class may implicitly leverage the knowledge from multiple base classes to construct its feature representation. Hence, simply reusing the pre-trained embedding space could lead to a scattered feature distribution and result in category confusion. To address such issues, we propose a two-step learning strategy referred to as Implanting and Compressing (IMCO), which optimizes both feature space partition and novel class reconstruction in a systematic manner. Specifically, in the Implanting step, we propose to mimic the data distribution of novel classes with the assistance of data-abundant base set, so that a model could learn semantically-rich features that are beneficial for discriminating between the base and other unseen classes. In the Compressing step, we adapt the feature extractor to precisely represent each novel class for enhancing intra-class compactness, together with a regularized parameter updating rule for preventing aggressive model updating. Finally, we demonstrate that IMCO outperforms competing baselines with a significant margin, both in image classification task and more challenging object detection task.

BIOGRAPHY

Mr Li is a Ph.D. candidate from Dept. of Electrical and Computer Engineering, NUS. His research interests includes the topics in computer vision and deep learning, such as few-shot learning, incremental learning and few-shot object detection.