Multimedia Content Understanding by Learning from Very Few Examples: Recent Progress on Unsupervised, Semi-Supervised and Supervised Deep Learning Approaches

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ABSTRACT

In this tutorial, the speaker will present several parallel efforts on building deep learning models with very few supervision information, with or without unsupervised data available. In particular, we will discuss in details.

- (1) Generative Adversarial Nets (GANs) and their applications to unsupervised feature extractions, semi-supervised learning with few labeled examples and a large amount of unlabeled data. We will discuss the state-of-the-art results that have been achieved by the semi-supervised GANs.
- (2) Low-Shot Learning algorithms to train and test models on disjoint sets of tasks. We will discuss the ideas of how to efficiently adapt models to tasks with very few examples. In particular, we will discuss several paradigms of learning-to-learn approaches.
- (3) We will also discuss how to transfer models across modalities by leveraging abundant labels from one modality to train a model for other modalities with few labels. We will discuss in details the cross-modal label transfer approach.

ACM Reference Format:

Guo-Jun Qi. 2018. Multimedia Content Understanding by Learning from Very Few Examples: Recent Progress on Unsupervised, Semi-Supervised and Supervised Deep Learning Approaches. In *ICMR '18: 2018 International Conference on Multimedia Retrieval, June 11-14, 2018, Yokohama, Japan*. ACM, New York, NY, USA, 1 page. <https://doi.org/10.1145/3206025.3210498>

BIO

Dr. Qi is a faculty member in the Department of Computer Science at the University of Central Florida. His research interests include knowledge discovery, analysis and aggregation of big data deluging from a variety of modalities and sources in order to build smart and reliable information and decision-making systems. He aspires to apply my research to solve the practical problems through high quality data processing and analysis in healthcare, sensor and social networks, financial systems and so forth. He was the recipient of one-time Microsoft Fellowship, and twice IBM Fellowships. His research has been sponsored by grants and projects from government agencies and industry collaborators, including NSF, IARPA, Microsoft, IBM, and Adobe. Dr. Qi has published more than 100 papers in a broad range of venues, such as Proceedings of IEEE, IEEE T PAMI, IEEE T KDE, IEEE T Image Processing, ACM SIGKDD, WWW, ICML, ACM MM, CVPR, ICDM, SDM and ICDE. Among them are the best student paper of ICDM 2014, the best ICDE 2013 paper by IEEE Transactions on Knowledge and Data Engineering, as well as the best paper (finalist) of ACM Multimedia 2007 (2015). He has served or will serve as a technical program co-chair for MMM 2016 and ACM Multimedia 2020, and an area chair (a senior program committee member) for ICCV, ICPR, ACM SIGKDD, ACM CIKM, as well as ACM Multimedia. He is also serving or has served in the program committees of several academic conferences, including CVPR, ICCV, KDD, WSDM, CIKM, IJCAI, ICMR, ACM Multimedia, ACM/IEEE ASONAM, ICDM, ICIP, and ACL. He is an associate editor for IEEE Transactions on Circuits and Systems for Video Technology (CSVT), as well as a guest/lead editor for the special issue on Big Media Data: Understanding, Search, and Mining in IEEE Transactions on Big Data, Deep Learning for Multimedia Computing in IEEE Transactions on Multimedia, and Social Media Mining and Knowledge Discovery in Multimedia Systems, Springer. He was also a panelist for the NSF and the United States Department of Energy.

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ICMR '18, June 11-14, 2018, Yokohama, Japan

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ACM ISBN 978-1-4503-5046-4/18/06.

<https://doi.org/10.1145/3206025.3210498>