BUET ACM Chapter Khan-Bose Lecture Series

presents

MultiCon: A Multi-Contrastive Learning based Semi-Supervised Classification Framework and Its Applications Towards Covid19

Speaker: **Latifur Khan**

Department of Computer Science, University of Texas at Dallas (UT Dallas), USA

Dr. Latifur Khan is currently a full Professor (tenured) in the Computer Science department at the University of Texas at Dallas, USA where he has been teaching and conducting research since September 2000. He received his Ph.D. degree in Computer Science from the University of Southern California (USC) in August of 2000. Dr. Khan obtained his B.Sc. degree in Computer Science and Engineering from Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh in November, 1993 with First class Honors (2nd position). He was a recipient of Chancellor Awards from the President of Bangladesh.

Dr. Khan is an ACM Distinguished Scientist and received IEEE Big Data Security Senior Research Award, in May 2019, and Fellow of SIRI (Society of Information Reuse and Integration) award in Aug, 2018. He has received prestigious awards including the IEEE Technical Achievement Award for Intelligence and Security Informatics, IEEE Big Data Security Award and IBM Faculty Award (research) 2016. Dr. Latifur Khan has published over 300 papers in premier journals such as VLDB, Journal of Web Semantics, IEEE TDKE, IEEE TDSC, IEEE TSMC, and AI Research and in prestigious conferences such as AAAI, IJCAI, ACM WWW, CIKM, ICDE, ACM GIS, IEEE ICDM, IEEE BigData, ECML/PKDD, PAKDD, ACM Multimedia, ICWC, ACM SACMAT, IEEE ICSC, IEEE Cloud and INFOCOM. He has been invited to give keynotes and invited talks at a number of conferences hosted by IEEE and ACM. In addition, he has conducted tutorial sessions in prominent conferences such as SIGKDD 2017, 2016, IJCAI 2017, AAAI 2017, SDM 2017, PAKDD 2011 & 2012, DASFAA 2012, ACM WWW 2005, MIS2005, and DASFAA 2007.

Currently, Dr. Khan's research area focuses on big data management and analytics, data mining and its application over cyber security, complex data management including geo-spatial data and multimedia data. His research has been supported by grants from NSF, NIH, the Air Force Office of Scientific Research (AFOSR), DOE, NSA, IBM and HPE. More details can be found at: `www.utdallas.edu/~lkhan/`

Abstract

Deep neural networks (DNN) require a large number of annotations, which sometimes is very expensive and cumbersome. Over the years, various efforts have been proposed for reducing the annotation cost when training the DNN. Semi-Supervised Learning (SSL) is one of the solutions that has been provably handy in leveraging unlabeled instances to mitigate the efficacy of the model's performance and has been attracting an increasing amount of attention in recent times. In this work, our main insight is that semi-supervised learning can benefit from recently proposed unsupervised contrastive learning approach, which aims to achieve the positive concentrated and negative separated representation in the unlabeled feature space. Herein, we introduce MultiCon, a semi-supervised learning paradigm that aims at learning data augmentation invariant based embedding. In particular, we combine the multi-contrastive learning approach with a consistency regularization method for maximizing the similarity between differently augmented views of one sample and pushing the embedding of different instances away in the latent space simultaneously. Experiments on multiple standard datasets including Covid19 Chest X-ray images and CT Scans demonstrate that MultiCon achieves state-of-the-art performance across existing SSL benchmarks.

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