

THE DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING SPEAKER SERIES

PRESENTS

Title: Modeling confounders (and bias) in medical studies in the age of deep learning



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LECTURE ABSTRACT

Abstract: The presence of confounding effects is inarguably one of the most critical challenges in medical applications. They influence both input (e.g., neuroimages) and the output (e.g., diagnosis or clinical score) variables and may cause spurious associations when not properly controlled for. Confounding effect removal is particularly difficult for a wide range of state-of-the-art prediction models, including deep learning methods. These methods operate directly on images and extract features in an end-to-end manner. This prohibits removing confounding effects by traditional statistical analysis, which often requires precomputed features (image measurements). In this talk, I will present methods to learn confounder-invariant discriminative features and novel normalization techniques to remove confounding and bias effects while training neural networks.

SPEAKER BIOSKETCH

Dr. Ehsan Adeli is an assistant professor at the department of psychiatry and behavioral sciences at Stanford University and is also affiliated with the department of computer science. He has served as an area chair in MICCAI (2020-2021), MIDL (2019), ICLR (2021), AAI (2021), and CVPR (2022). Prof. Adeli has co-organized several conferences such as ICDSC 2017 and workshops in conjunction with MICCAI, CVPR, ICCV, NeurIPS (12 workshops/tutorial/challenges in total to date). He is an associate editor of IEEE Journal of Biomedical Health and Informatics and Journal of Ambient Intelligence and Smart Environments.

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