

THE DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING SPEAKER SERIES

PRESENTS

The Impact of Deep Learning on Radiology



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Room W122, Engineering Building 2

LECTURE ABSTRACT

Building upon major advances in computer science, there has been an explosion of research interest in the use of deep learning in radiology. In this presentation, I will show how deep learning has led to major performance improvements in radiology image analysis, including automated body part recognition, lesion segmentation and detection. I will discuss how deep learning may enable fully-automated radiology image interpretation. Finally, I will show how deep learning systems can be trained using large numbers (>100,000) of radiology images and text reports.

SPEAKER BIOSKETCH

Ronald M. Summers received the B.A. degree in physics and the M.D. and Ph.D. degrees in Medicine/Anatomy & Cell Biology from the University of Pennsylvania. He completed a medical internship at the Presbyterian-University of Pennsylvania Hospital, Philadelphia, PA, a radiology residency at the University of Michigan, Ann Arbor, MI, and an MRI fellowship at Duke University, Durham, NC. In 1994, he joined the Diagnostic Radiology Department at the NIH Clinical Center in Bethesda, MD where he is now a tenured Senior Investigator and Staff Radiologist. In 2013, he was named a Fellow of the Society of Abdominal Radiologists. He is currently Chief of the Clinical Image Processing Service and directs the Imaging Biomarkers and Computer-Aided Diagnosis (CAD) Laboratory. In 2000, he received the Presidential Early Career Award for Scientists and Engineers, presented by Dr. Neal Lane, President Clinton's science advisor. In 2012, he received the NIH Director's Award, presented by NIH Director Dr. Francis Collins. His research interests include deep learning, virtual colonoscopy, CAD and development of large radiologic image databases. His clinical areas of specialty are thoracic and abdominal radiology and body cross-sectional imaging. He is a member of the editorial boards of the Journal of Medical Imaging and Academic Radiology and a past member of the editorial board of Radiology. He is a program committee member of the Computer-aided Diagnosis section of the annual SPIE Medical Imaging conference and will be co-chair of the entire conference in 2018 and 2019. He has co-authored over 400 journal, review and conference proceedings articles and is a coinventor on 14 patents.

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