

(Online)

# Recent Progress in Machine Learning and Implications for the Process and Energy Systems Engineering Fields

## 機器學習的最新發展與其於流程及能源系統工程領域上的影響

Date: 27 January, 2021 (Wednesday)

Time: 09:30am — 10:30am

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Seminar Series  
數據科學大師講座



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### Abstract

Machine learning has recently come into limelight and its popularity is spurred by advances in deep learning, reinforcement learning, GPU-based computing, and commercial interest in big data and predictive analytics. Despite the enthusiasm, some renowned experts of the field have expressed skepticism, which is justifiable given the previous disappointment with neural networks and other AI techniques. On the other hand, new fundamental advances like the ability to train neural networks with a large number of layers for hierarchical feature learning can bring significant new opportunities.

In this presentation, I will critically examine the main motivation behind and advances in deep learning. I will also discuss the recent advances in another branch of machine learning called 'reinforcement learning' and its relationship with dynamic programming and self-optimizing simulation. Implications of these advances for the fields of process and energy systems engineering are discussed and the problem of integrated planning and operation of a hybrid renewable energy network is used to illustrate the potential of the approach. The seminar will also include a brief introduction of KAIST and activities at Aramco-KAIST CO<sub>2</sub> Management Center.

### Biography

Prof Lee joined Korea Advanced Institute of Science and Technology (KAIST) in 2010. He recently served as the Associate Vice President of International Office and is currently serving the role of International Relations Advisor to the President. He is also the founding director of Saudi Aramco-KAIST CO<sub>2</sub> Management Center.

He was a recipient of the National Science Foundation's Young Investigator Award in 1993 and also the AIChE CAST Computing in Chemical Engineering Award in 2013. He was elected as an IEEE Fellow in 2011, an IFAC Fellow in 2011, and an AIChE Fellow in 2013. He is a member of both the Korean National Academy of Science and Technology (KAST) and the National Academy of Engineering Korea (NAEK). He was also the 29th Roger Sargent Lecturer in 2016.

