

DEPARTMENT OF COMPUTER SCIENCE

SEMINAR

2025 SERIES

# NN Learning Driven Automatic Control & Automatic Control for Machine Learning

DATE & TIME

17 MAR 2025 (MON) 10:30 - 11:30 AM

Cheung Ching Lan Diana Memorial Lecture Theatre (WLB 204)  
The Wing Lung Bank Building for Business Studies, Shaw Campus



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### ABSTRACT

In contemporary engineering and scientific research, the interplay between automatic control and machine learning has become increasingly significant. This report explores two key aspects of this relationship: the application of machine learning techniques to enhance automatic control systems and the use of automatic control principles to improve machine learning algorithms. Firstly, we discuss how machine learning can be leveraged to optimize control strategies in complex systems, enabling adaptive and intelligent responses to dynamic environments. Techniques such as reinforcement learning and neural networks are examined for their ability to learn from data, resulting in more efficient control mechanisms that can handle uncertainty and nonlinearity. Secondly, we investigate how principles of automatic control can be applied to refine machine learning processes. Concepts such as feedback control can be utilized to stabilize learning algorithms, reduce overfitting, and ensure convergence in various machine learning applications. This dual perspective highlights the mutual benefits and synergies that arise from integrating these two fields. Through case studies and examples, we demonstrate the transformative potential of combining machine learning and automatic control, paving the way for advances in robotics, autonomous systems, and smart technologies. Ultimately, this report aims to provide insights into the future directions of research and the practical implications of merging these two domains.



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