

SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COLLEGE OF DESIGN AND ENGINEERING

Website: <https://cde.nus.edu.sg/ece>

Area: Power and Energy Systems (PES)

Host: Prof Dipti Srinivasan

Co-organized by Green Energy Management and Smart Grid Research Center, ECE NUS

TOPIC	:	Evolutionary Computation Meets Large Language Models: Synergies and Real-World Applications
SPEAKER	:	Dr Dikshit Chauhan Research Fellow, ECE Department, NUS
DATE	:	Thursday, 15 October 2026
TIME	:	8:00PM to 9:00PM
VENUE	:	SDE3 – LT422

ABSTRACT

Evolutionary Computation (EC) and Large Language Models (LLMs) are two important paradigms in modern computational intelligence, offering complementary capabilities for optimization, learning, and intelligent problem-solving. Evolutionary algorithms (EAs) provide population-based search mechanisms for tackling complex optimization problems, while LLMs offer capabilities in language understanding, reasoning support, code generation, and knowledge-guided assistance. Their integration creates new opportunities for developing adaptive and intelligent optimization systems.

This lecture explores the interaction between EC and LLMs, focusing on how these two paradigms can enhance each other. First, it discusses how evolutionary algorithms can improve LLM-based systems through prompt optimization, hyperparameter tuning, and other search-based techniques. Second, it examines how LLMs can support evolutionary computation through heuristic generation, adaptive operator control, and automated algorithm design. The lecture also introduces emerging co-adaptive frameworks in which LLMs and evolutionary algorithms interact through iterative feedback and refinement.

Through illustrative examples, including evolutionary prompt optimization and engineering applications, the lecture highlights the underlying mechanisms, practical opportunities, and key challenges of integrating LLMs with evolutionary computation. The aim is to provide students with an accessible understanding of this emerging area and demonstrate how the combination of language-based intelligence and evolutionary search can support more effective and adaptable problem-solving.

BIOGRAPHY

Dr. Dikshit Chauhan is a Research Fellow in the Department of Electrical and Computer Engineering at the National University of Singapore (NUS). He received his Ph.D. in Mathematics and Computing from Dr. B. R. Ambedkar National Institute of Technology, Jalandhar, India. His research interests lie at the intersection of evolutionary computation, machine learning, and optimization, with applications in intelligent power and energy systems. His current work focuses on electric vehicle charging and vehicle-to-grid scheduling, battery degradation-aware optimization, and the emerging synergy between large language models and evolutionary algorithms for real-world engineering applications.

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