

# Topological deep learning: The past, present, and future

## About the talk

In the past few years, topological deep learning (TDL), a term coined by us in 2017, has become an emerging paradigm in artificial intelligence (AI) and data science. TDL is built on persistent homology (PH), an algebraic topology technique that bridges the gap between complex geometry and abstract topology through multiscale analysis. While TDL has made huge strides in a wide variety of scientific and engineering disciplines, its most compelling success was observed in biosciences with intrinsically high dimensional and intricately complex data.

I will discuss the achievements of TDL in drug discovery and accurate forecasting of emerging viral variants. I will further discuss the limitations and challenges of TDL, and how new approaches based on algebraic topology, geometric topology and differential geometry may address these challenges. I will also discuss how topology is enabling AI and how AI is assisting topological reasoning.

## Speaker



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## Date and time

23 October 2024, 9.30am  
Singapore (GMT +8)  
USA (GMT -4)

Scan QR code for Zoom link



The talks are part of the program on  
[Interactions of Statistics and Geometry \(ISAG\) II](#)