

LUIAS Distinguished Lecture

Theory of Transformers and In-context Learning

Speaker

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University of Sydney

Senior Lingnan Scholar

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Date: 15 January 2026 Time: 11:45AM - 12:45PM

Venue: MBG01, Patrick Lee Wan Keung
Academic Building

Mode: Face-to-face



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Abstract

Attention-based networks have demonstrated remarkable learning abilities for various practical tasks. But little is known about their theoretical foundations. In this talk, we give some theoretical understanding of linear transformers under a two-staged sampling process from domain generalization. We show that linear transformers perform in-context learning as learning a mapping from context distributions to response functions. Rates of convergence for generalization bounds are presented.

Biography

Prof Dingxuan Zhou is Professor and Head of School of Mathematics and Statistics, University of Sydney. Before moving to Australia, he was a Chair Professor in the School of Data Science and Department of Mathematics, City University of Hong Kong, serving also as Director of the Liu Bie Ju Centre for Mathematical Sciences (2019-22), Associate Dean of School of Data Science (2018-22), and Head of Department of Mathematics (2006-12). His recent research interests include theory of deep learning, neural networks, statistical learning theory, wavelet analysis, approximation theory, data science and applications. He was rated in 2014-2017 by Thomson Reuters/Clarivate Analytics as a highly-cited researcher. The research grants he has received include a Fund for Distinguished Young Scholars from NSF of China in 2005, twenty-five GRF/CERG projects from Research Grants Council of Hong Kong (one for each year during his service at CityU), and two Discovery Projects from Australian Research Council. He is serving on the editorial board of more than ten international journals and is an editor-in-chief of the journals "Analysis and Application" and "Mathematical Foundations of Computing".

ALL ARE WELCOME

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