

THE UNIVERSITY



OF HONG KONG

*Institute of Mathematical Research
Department of Mathematics*

Departmental Seminar

Group invariant machine learning on pure maths datasets

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Abstract

It is a recent trend to use machine learning on pure maths datasets, for example to approximately compute geometric invariants of spaces that are expensive to compute exactly. Often, the map taking some representation of a space to its geometric invariants is invariant under some group action. A common example is that the input space is represented by a matrix and the map is invariant under row and column permutations. I report on some work comparing group invariant and ordinary machine learning models on such datasets. We find that models that are approximately group invariant perform better than fully group invariant models and better than models that are not invariant at all. I will explain one such “approximately group invariant” machine learning model in detail. This is based on two joint works: one published paper with B. Aslan, D. Sheard, and one unpublished work in progress with C. Ewert, S. Magruder, V. Maiboroda, Y. Shen, P Singh.

Date: February 8, 2024 (Thursday)

Time: 2:00 – 3:00pm

Venue: Room 210, Run Run Shaw Building, HKU

All are welcome