

THE UNIVERSITY



OF HONG KONG

Department of Mathematics

Departmental Seminar

Stability and Generalization in Graph Convolutional Neural Networks

Dr. Ron Levie

Department of Mathematics,
Ludwig Maximilian University of Munich

Abstract

In recent years, the need to accommodate non-Euclidean structures in data science has brought a boom in deep learning methods on graphs, leading to many practical applications with commercial impact. In this talk, we will review the mathematical foundations of the generalization capabilities of graph convolutional neural networks (GNNs). We will focus mainly on spectral GNNs, where convolution is defined as element-wise multiplication in the frequency domain of the graph.

In machine learning settings where the dataset consists of signals defined on many different graphs, the trained GNN should generalize to graphs outside the training set. A GNN is called transferable if, whenever two graphs represent the same underlying phenomenon, the GNN has similar repercussions on both graphs. Transferability ensures that GNNs generalize if the graphs in the test set represent the same phenomena as the graphs in the training set. We will discuss the different approaches to mathematically model the notions of transferability, and derive corresponding transferability error bounds, proving that GNNs have good generalization capabilities.

Date: December 2, 2021 (Thursday)

Time: 4:30 - 5:30pm

Venue: Room 210, Run Run Shaw Bldg., HKU



Attendance limited
Register Now

All are welcome