Michael Bronstein & Team (Dec 27 to Dec 29)

Google Collab Notebook:
The following introductory notebook is designed to be self-contained. Please run the code on Google Colab as GPU is recommended.

https://drive.google.com/file/d/1pnTwmkIhGvbyF00Aoplu65DqaeG7IC-x/view?usp=drive_link

1. Visual Group Theory
Chapters 1-3
Link: https://web.osu.cz/~Zusmanovich/teach/books/visual-group-theory.pdf

2. Video Intro on Group Theory:
Link:
https://www.youtube.com/playlist?list=PLDcSwjT2BF_VuNbn8HiHZKKy59SgnIAeO

3. Geometric Deep Learning: Geometric Deep Learning: Grids, Groups, Graphs, Geodesics, and Gauges
Chapters 1-4
Link: https://arxiv.org/abs/2104.13478

Day	Oxford Lecture	Content	Who?	Time
27/12	GDL 1+2	**Introduction:** Motivation, history of deep learning, examples of CNNs and GNNs. *[Pre-read: Chapter 1 of GDL Book or The Gradient blog post]*	MB	10:30-11:15 45min
	GDL 3	**Basics of ML in high dimensions:** basics of statistical learning, universal approximation, curse of dimensionality, function regularity classes *[Pre-read: Chapter 2 of GDL Book]*	MB	11:15-12:00 45min

	GDL 4+5	**Geometric priors:** symmetry & invariance, group representations, scale separation, GDL blueprint *[Pre-read: Chapter 3 of GDL Book]* *[Optional: Problems & solutions]*	OB?	12:00-13:00 1hr
		Lab session I: some basics of ML & geometric priors?	AE+OB	14:00-15:30
28/12	GDL 6	**Sets:** permutation invariance, universal approximation, DeepSets	MB	8:30-9:00 30min
	GDL 7	**Graphs I:** basics	IC	9:00-10:00 1hr
	GDL 8	**Graphs II:** advanced methods: graph rewiring, subgraph methods, asynchronous, Co-GNNs,	IC	10:30-11:30 1hr
	G	**Transformers I**	VD	11:30-12:00
	G	**Transformers II**	VD	12:00-13:00
		Lab session II: GNNs?	AE+OB	14:00-15:30
29/12	GRL ?	**Knowledge Graphs & Link Prediction I:**	IC	8:30-9:15 45min
	GRL ?	**Knowledge Graphs & Graph Foundation Models II:**	IC	9:15-10:00 45min
	GDL 9+part of 10	**Grids:** convolutions and circulant matrices, Fourier transform, FFT, CNNs, scattering *[High-level pre-read: Medium blog post]* *[Optional: Problems & solutions]*	MB	10:30-11:15 45min

	GDL 15	**Spectral methods:** Laplacian operator, graph Fourier transforms, spectral filters	MB	11:15-12:00 45min
	GDL 16	**Neural diffusion & physics-inspired methods:** *[High-level pre-read: Medium blog post]*	MB	12:00-13:00 1hr
		Lab session III: spectral GNNs / neural diffusion?	AE+OB	14:00-15:30

Dec 30

Danda Pani Paudel
https://www.youtube.com/watch?v=KJtZARuO3JY

Jan 4

Dilli Raj Paudel

1. https://github.com/BigDataWUR/MLforCropYieldForecasting

Related paper is here: https://doi.org/10.1016/j.agsy.2020.103016

I will use mlbaseline_pkg.ipynb notebook in Google Colab environment for hands-on exercise.

2. https://github.com/BigDataWUR/AgML-CY-Bench
Relevant paper: https://openreview.net/forum?id=jkJDNG468g#discussion

I will use notebooks/run_cybench.ipynb notebook in Google Colab environment for the hands-on exercise.