The Erdős Institute

TOPOLOGICAL DATA ANALYSIS
Spring 2024 Syllabus

Course Aim
This is a study group to learn basics of topological data analysis. Our main textbook is "Computational Topology for Data Analysis" by Tamal Krishna Dey and Yusu Wang.

Content
Every week, we will have an assigned reading followed up with a zoom meeting in which we'll discuss the material with one of us summarizing the content.

Week	Subject	Presenter	Date	Reference
1	Basics (1.1,1.2,1.3)	Cisil Karaguzel	30 Jan 2024 (1-2 pm EST)	Computational Topology for Data Analysis
2	Basics (2.1,2.2)	Selman Ipek	6 Feb 2024 (1-2 pm EST)	Computational Topology for Data Analysis
3	Homological algebra (2.4,2.5-2.5.1)	Tushar Pandey	13 Feb 2024 (1-2 pm EST)	Computational Topology for Data Analysis
4	Persistent Homology (3.1,3.2,3.4)	Aziz Burak Gulen	20 Feb 2024 (1-2 pm EST)	Computational Topology for Data Analysis
5	Stability Theorems	Hitesh Gakhar	27 Feb 2024 (1-2 pm EST)	https://arxiv.org/abs/1905.13400
6	Graphical Summaries in TDA	Discussion session	5 March 2024 (1-2 pm EST)	https://research.math.osu.edu/tgda/mapperPBG.pdf
7	Topological Machine Learning	Sriram Raghunath	12 March 2024 (1-2 pm EST)	https://ieeexplore.ieee.org/abstract/document/10235748
8	Topological Machine Learning	Discussion session	19 March 2024 (1-2 pm EST)	https://ieeexplore.ieee.org/abstract/document/10235748
9		Discussion session on examples	26 March 2024 (1-2 pm EST)	
10		Discussion session on examples	2 April 2024 (1-2 pm EST)	

Course Information

1) Course Format

There is a schedule on our course website with required readings for each week. Each week, we will meet on **Tuesdays 1-2 pm (EST) on Zoom** to discuss to the assigned material. We will have a presenter among the participants for each of the weeks who will summarize the content. (The zoom meetings will not be recorded.)

2) Our GitHub Repository

Our GitHub repository will contain summarized notes and related codes to each week's material. It will be updated regularly.

https://github.com/TheErdosInstitute/TDA-spring-2024

3) Group Projects

The aim is to complete a TDA project by the end of the program.

4) Remarks

Please make sure to be added on our "spring-2024-tda-study-group" slack channel. We communicate through slack.