

MA 59800 - Fall 2018- Syllabus Topological Data Analysis

Faculty: Ralph Kaufmann

Office: MATH 710, Tel: (765) 494-1205

E-mail: rkaufman@math.purdue.edu

URL: <http://www.math.purdue.edu/~rkaufman>

Class times: TR 9:00 – 10:15 am in MATH 215

Homepage for the course: <http://www.math.purdue.edu/~rkaufman/MA598f18/>

Office hours: Tuesday 2:00-2:50.

If you have a conflict with these times, we can arrange for another time to meet.

Texts: Some references are:

"Computational Topology" by Herbert Edelsbrunner and John L. Harer

"[Topological pattern recognition for point cloud data](#)" Acta Numerica. 23. by Gunnar Carlsson.

more tba.

Course description:

This will be an introduction to topological data analysis. The goal is to provide an understanding of the basic concepts and further more advanced topics. The basic concepts will include persistent homology and bar codes as well as the underlying topological notions. Further topics may include visualisation using the Mapper algorithm, principal component analysis, and various clustering algorithms.

Required Work: Besides the expected participation in class there may be short homework assignments. Oral presentation by students are envisioned.

Academic Integrity. <http://www.purdue.edu/odos/osrr/academic-integrity/index.html>

Academic Adjustments for Students with Disabilities:

Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone: 765-494-1247. <http://www.purdue.edu/drc/faculty/syllabus.html>

CAPS Information: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at (765)494-6995 and <http://www.purdue.edu/caps/> during and after hours, on weekends and holidays, or by

going to the CAPS office of the second floor of the Purdue University Student Health Center (PUSH) during business hours.