Topological Data Analysis (TDA) finds structure in data sets, so that data sets may be summarized and compared. The field, which has grown rapidly in popularity over the past few years, attracts researchers from computer science, mathematics, statistics, as well as various applied fields (biomedical engineering, networks, biology, ...).

At MSU, we have a diverse, collaborative community of faculty and students working in or interested in TDA. We hold a weekly reading group where we present and discuss different tools used in TDA. Some of the projects that we are working on include: analysis of time-series data, developing modeling techniques in cell and systems biology, developing quantitative descriptors of biopsy images to assist cancer diagnosis, evaluating the demographics of network quality, developing statistical techniques for hypothesis testing in TDA, and evaluating the effectiveness of real-time geo-targeting in mobile applications.

We are interested in having more students and faculty join our community of researchers interested in topological data analysis. If you are interested, please contact Brittany Terese Fasy <brittany@cs.montana.edu>. We look forward to

**Marketability**

The market for US based computing careers is expected to thrive, with the US Bureau of Labor Statistics (BLS) projecting that computing will be one of the fastest growing US job markets in science, technology, engineering, and mathematics (STEM) for the foreseeable future. Almost 75% of new US science or engineering jobs will be in computing, while only 16% will be in traditional engineering positions. The BLS predicts that 27% of the new STEM positions will be in software engineering.

**TDA Current Members**

Dr. Brittany Fasy (CS Dept.)
Dr. Tomas Gedeon (Math Dept.)
Sam Micka (CS Ph.D)
Dr. David Millman (CS Dept. & Industry)
Dr. Brendan Mumey (CS Dept.)
Sawyer Payne (CS UGRD)
Dr. Christine Sung (Business Dept.)
Ryan Thompson (CS UGRD)
About Montana State University
Founded in 1893 as Montana’s land grant college, Montana State University is a comprehensive, multipurpose university, integrating programs of instruction, research, and public service.

MSU is located in Bozeman, Montana, an extended community of 70,000 nestled in the Rocky Mountains about 90 miles north of Yellowstone National Park. In addition to providing access to extraordinary teaching and research programs, Bozeman is renowned for year-round recreational and cultural opportunities that include access to world class ski areas, multiple blue ribbon trout streams and the Gallatin National Forest. The local airport is served by four national airlines and is the second busiest airport in the state.

Named an All American City, Bozeman boasts high-quality medical facilities, a very low crime rate, many fine restaurants, acclaimed public and private schools, a symphony orchestra and choir, an annual opera, and nationally known events such as the Sweet Pea Festival of the Arts held in early August.

Financial Support
There are many different possibilities for graduate students to obtain financial help. Outstanding graduate students can receive financial support (as TAs or RAs) for the program duration subject to satisfactory progress. Ph.D. students in good standing and making appropriate progress towards the degree typically receive RA support from ongoing grants. All graduate students are welcome to apply to be a TA at any point during their graduate careers. Scholarships are available to qualified undergraduate students. Scholarship applications are typically due in early February. Scholarships are funded through the generosity of individuals and organizations.

International Students
International students are permitted to work on campus for up to 20 hours per week. For additional information, please visit the web pages of the Office of International Programs at http://www.montana.edu/international/

CS Degree Programs
The Computer Science Department offers degrees at the B.S., M.S., and Ph.D. levels.

TDA-Related Courses
- Computational Geometry
- Topological Data Analysis
- Algebraic Topology

General Courses Include
- Artificial Intelligence
- Compilers
- Computational Biology
- Computer Architecture
- Computer Networks
- Data Mining
- Data Structures and Algorithms
- Database Systems
- Discrete Math
- Ethics
- Machine Learning
- Operating Systems
- Programming Languages
- Robot Vision
- Robotics/Embedded Systems
- Software Engineering
- Systems Administration

“Data has shape and that shape matters.” – Gunnar Carlsson