Syllabus for SIADS 532: Data Mining I

Course Overview and Prerequisites

This course will introduce basic concepts and tasks of data mining. It focuses on how to formally represent real world information as basic data types (itemsets, matrices, and sequences) that facilitate downstream analytics tasks. Students will learn how to characterize each type of data through pattern extraction and similarity measures.

Course prerequisites: Mathematics Methods for Applied Data Science, Data Manipulation

Instructor and Course Assistants

Instructor: Qiaozhu Mei - qmei@umich.edu
Course Assistant: Wei Ai - aiwei@umich.edu
Course Assistant: Yumou Wei - yumouwei@umich.edu

Send emails to the instructional team at siads532-f19-instructors@umich.edu

Communication Expectations

Contacting instructor and course assistant: Course channel in Slack (siads532_fa19)
Email response time: 24 - 48 hours
Slack response time: 24 - 48 hours
Office hours: see Course Schedule below

Required Textbook

- Data mining: concepts and techniques. Han, J., Pei, J. and Kamber, M. (3rd Edition) [DMCT]
- Mining of massive datasets. Leskovec, Jure, Anand Rajaraman, and Jeffrey David Ullman. (2nd Edition) [MMDS]

Online access to these textbooks are provided through the University of Michigan Library. You may be asked to sign in with your UMich uniqname and password to access these materials.

Technology Requirements unique to this course

None

- If you encounter a technical issue with coursera or admin issues with slack, please submit a report to the ticketing system at umsimadshelp@umich.edu and also cc siads532-f19-instructors@umich.edu.

Accessibility

Screen reader configuration for Jupyter Notebook content

Learning Outcomes

1. Understand the basic concepts of knowledge discovery from data.
2. Describe the basic computational tasks of data mining, including associations, retrieval, classification, clustering, ranking, prediction, and outlier detection.
3. Formulate real world data as item sets, matrices, or sequences and articulate the pros and cons.
4. Extract patterns and associations from itemsets, matrices, and sequences.
5. Compute similarities/distances of item sets, vectors, and sequences.
6. Know how these techniques are applied to different domains.

Course Schedule

This course **begins on Tuesday, November 26, 2019** and **ends on Monday, December 23, 2019.**

Weekly Quizzes and Programming Assignments will be due on Mondays at 11:59 pm (time zone = Ann Arbor, Michigan = Eastern Time).

Schedule of Weekly Office Hours via Zoom (time zone = Ann Arbor, Michigan = Eastern Time):

- **Mondays 11 am - 12 noon** (Qiaozhu Mei), except for **12/2, which will be on 4 pm - 5 pm.**
- **Thursdays 3 pm - 4 pm** (Yumou Wei), except 11/28 because of Thanksgiving
- **Fridays 3 pm - 4 pm** (Wei Ai), except 11/29 because of Thanksgiving
- **Special office hour on Tuesday, November 26th 4 pm - 4:30 pm.**
- Access via Live Events from the course menu

Grading

Course Assignment	Percentage of Final Grade
Wk 1 Quiz Part 1 - Basic Concepts	2.5%
Wk 1 Quiz Part 2 - Data Representations	3.75%
Wk 1 Quiz Part 3 - Solving a Real World Problem	13.75%
Wk 1 Assignment 1 - Patterns and Similarities	5%
Wk 2 Assignment 2 - Part 1 - Mining Itemsets	1.25%
Wk 2 Assignment 2 - Part 2 - Mining Itemsets	5%
Wk 2 Assignment 2 - Part 3 - Mining Itemsets (+ 10 pt bonus)	10%

Wk 2 Assignment 2 - Part 4 - Mining Itemset	3.75%
Wk 2 Assignment 2 - Part 5 - Mining Itemset	5%
Wk 3 Assignment 3 - Part 1 - Mining Vectors and Matrices	1.25%
Wk 3 Assignment 3 - Part 2 - Mining Vectors and Matrices	11.25%
Wk 3 Assignment 3 - Part 3 - Mining Vectors and Matrices	6.25%
Wk 3 Assignment 3 - Part 4 - Mining Vectors and Matrices	6.25%
Wk 4 Assignment 4 - Part 1 - Mining Sequence Data	10%
Wk 4 Assignment 4 - Part 2 - Mining Sequence Data	7.5%
Wk 4 Assignment 4 - Part 3 - Mining Sequence Data	7.5%
Total	100%

Note: All assignments are required to earn credit for this course.

Letter Grades, Course Grades, and Late Submission Policy

Refer to the MADS Assignment Submission and Grading Policies section of the UMSI Student Handbook (access to Student Orientation course required).

Accommodations

Refer to the Accommodations for Students with Disabilities section of the UMSI Student Handbook (access to the Student Orientation course required).

Use the Student Intake Form to begin the process of working with the University's Office of Services for Students with Disabilities.

Help Desk(s): How to get Help

- Degree program questions or general help - umsimadshelp@umich.edu
- Coursera's Technical Support (24/7) - https://learner.coursera.help/

Library Access

Refer to the U-M Library's information sheet on accessing library resources from off-campus. For more information regarding library support services, please refer to the U-M Library Resources section of the UMSI Student Handbook (access to the Student Orientation course required).

Student Mental Health

Refer to the University's Resources for Stress and Mental Health website for a listing of resources for students.

Student Services

Refer to the Introduction to UMSI Student Life section of the UMSI Student Handbook (access to the Student Orientation course required).