UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Social Media Analytics

2627-2-FDS02Q018

Aims

Knowledge and Understanding

The course aims to provide students with the fundamental concepts underlying the management of data generated from social media platforms (access, pre-processing, and modeling) and their subsequent analysis.

Applying Knowledge and Understanding

Students will be able to collect, process, and analyze data from major social media platforms, using the most appropriate technologies for the task. They will also be able to represent complex social structures in order to extract meaningful information. During lectures and lab activities, students are encouraged and assessed on their ability to apply the knowledge acquired on the topics covered in the course.

Making Judgements

The course aims to foster independent judgement and critical analysis skills in relation to the main challenges involved in collecting, representing, and analyzing data from social platforms. These competencies will also be developed through in-class discussions and lab activities.

Communication Skills

Development of the ability to clearly, consciously, and unambiguously communicate technical content, ideas, problems, and corresponding solutions to different types of audiences. These skills will be promoted during the course and assessed as part of the final examination.

Learning Skills

The course is designed to provide both theoretical knowledge and practical skills, offering a solid foundation for further individual study of the principles of retrieval, representation, and analysis of social data.

Contents

1. Introduction to the Social Web;
2. Data in social media and related issues (including privacy);
3. Representing complex social data structures: graph and network theory;
4. Social Network Analysis: metrics;
5. Social Network Analysis: algorithms for community detection in social networks;
6. Social Content Analysis: subjectivity and sentiment analysis, irony detection;
7. Social Content Analysis: Named Entity Recognition and Linking;
8. Visualization of data from social media and the analysis on such data.

Detailed program

1. Introduction

- The Social Web: introduction and related terminology: Social Web, Social Networks, Social Media, User-Generated Content (UGC);
- Different classes of social “information objects”: 1) texts: posts, blogs, microblogs, 2) images, 3) audios, 4) videos;
- Social Media Analytics: definition and objectives. The concepts of auto-presentation and auto-disclosure.

2. Data in social media

- Main social platforms, Advanced Programming Interfaces (API)s, the “crawling” process;
- Pre-processing and storing of social data;
- Hints of data collection issues, both legally (the GDPR) and technologically.

3. Social data representation

- Elementary and complex data structures;
- Representing social structures via a graph-based representation (graph theory, network topologies).

4./5. Social Network Analysis

- Link analysis, Web link analysis, and related metrics;
- Network clustering: community-detection algorithms;
- Influence and contagion in social media.

6./7. Social Content Analysis

- Introduction to concepts of Natural Language Processing in the context of social networks;
- Objectivity/subjectivity, polarity, emotion and irony in social networks;
- Lexical and Semantic Approaches;
- Named-entity Recognition and Linking.

8. Visualization of social media data: open issues and techniques

Prerequisites

Basic knowledge of the principles of linear algebra, statistics, programming.

Teaching form

- Lectures (28 hours).
- Laboratory sessions (18 hours).
- The course will be taught in English.
- Each lecture lasts 2 hours and is delivered in both expository mode (especially at the beginning of the session) and interactive mode (during the session), to ensure active student engagement.
- Some lectures may be delivered remotely in an expository-interactive format.

Textbook and teaching resource

- Rahman, Md Saidur. Basic graph theory. Springer, 2017.
- Reinhard Diestel. Graph Theory. Springer, 2017.
- Suliman Hawamdeh, Hsia-Ching Chang. Analytics and Knowledge Management. CRC Press. 2018.
- John Scott. Social Network Analysis. Sage, 2012.
- Bing Liu. Sentiment Analysis and Opinion Mining. Morgan & Claypool. 2016.
- Eneko Agirre, Philip Edmonds. Word Sense Disambiguation: Algorithms and Applications (Text, Speech and Language Technology). Springer. 2007.

Semester

First semester.

Assessment method

Written exam with exercices and open questions.
The written test aims at the extensive and intensive evaluation of the theoretical and theoretical-practical skills acquired during the course.

Group project (with oral presentation).
The project aims to assess students' ability to apply the skills acquired during the course to real-world scenarios, through the development and use of technological solutions for social media data analysis. The project is presented in person by the students to verify these competencies, both technical and critical judgement, while also fostering communication skills.

- The written exam is assessed on a scale from 0 to 24.
- Students must obtain a score greater than or equal to 14.5 in the written test in order for the written exam to be considered passed.
- The project, with relative oral discussion, is evaluated on a scale from 0 to 8.

The final grade will be given by the sum of the evaluation obtained in the written exam (only if greater than or equal to 14.5) and by the evaluation related to the project.

No midterm exams are scheduled.

Office hours

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Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | GENDER EQUALITY | REDUCED INEQUALITIES