

CSC 577: Recommender Systems

Winter Quarter 2017

Professor Robin Burke

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Office Hours: Th 10:00 – 11:00 am (Lincoln Park) and 2:00 – 3:00 pm (Loop)
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Email (preferred): rburke@cs.depaul.edu
Prerequisite: SE 450 and (IS 467 or CSC 478 or ECT 584)
Course discussion: <https://csc577winter17.slack.com/>

Description

Recommender systems offer personalized access to online information in product catalogs, social media networks, and document collections, among other applications. This class will introduce students to a range of approaches for building recommender systems including collaborative, content-based, knowledge-based, and hybrid methods. Students will implement recommendation algorithms using an open-source toolkit and conduct experimental evaluations.

Readings

Aggarwal, C. C. *Recommender Systems: The Textbook*. Springer 2016. ISBN 978-3-319-29657-9.
Available through the DePaul library.

Note

The schedule and other information in the syllabus are subject to change. Consult the D2L site for the most up-to-date information.

Resources

This term we will be using Slack for course discussions. Please sign up to receive the most recent updates about course materials and assignments.

Assessment

The class involves regular four homework assignments, three online quizzes, and a final project:

Assignments: 35%
Quizzes: 20%
Participation: 5%
Final Project: 40%

Tentative Schedule

1/5 (Week 1): Introduction to Recommender Systems / Neighborhood-based methods
Recommendation and information retrieval. Knowledge sources. Neighborhood-based methods.
Introduction to the LibrRec system.
Reading: Aggarwal, Ch. 1 and 2.1-2.4
Assigned: Homework 0 and Homework 1

1/12 (Week 2): Model-based Collaborative Recommendation
Dimensionality reduction. Regression: Slope1 and SLIM models. Association rules and Naïve Bayes models.
Reading: Aggarwal, Ch. 2.5-2.6, 3.1-3.5
Due: Homework #0

1/19 (Week 3): Factorization Methods of Collaborative Recommendation

Note later start time: 6:15 (Studio χ event)

Latent factor models. Optimization techniques. Singular value decomposition, constrained matrix factorization.

Reading: Aggarwal, Ch. 3.6-3.8

Due: Homework #1

Assigned: Homework #2

1/26 (Week 4): Content-based Recommendation

Feature representation, extraction, and selection. User profiles. Learning models.

Reading: Aggarwal, Ch. 4

Due: Project brainstorming

Due: Quiz 1

2/2 (Week 5): Knowledge-based Recommendation

Constraint-based recommendation. Critiquing systems.

Reading: Aggarwal, Ch. 5

Due: Homework #2

Due: Project proposal

2/9 (Week 6): Evaluation

Types of evaluation for recommender systems. Evaluation design. Prediction metrics and ranking metrics.

A/B Testing

Reading: Aggarwal, Ch. 7

Due: Project data

Assigned: Homework #3

2/16 (Week 7): Hybrid Recommendation

Complementarities between recommendation techniques and knowledge sources. Combining recommendation methods.

Reading: Aggarwal, Ch. 6

Due: Initial results

2/23 (Week 8): Context-aware recommendation

First half of class: Studio χ event: Invited speaker Thomas Haigh.

Context effects in recommendation. Types and representations of context. Pre-filtering, post-filtering and contextual modeling. Temporal and location-sensitive models.

Reading: Aggarwal, Ch. 8 and 9

Due: Homework #3

3/2 (Week 9): Recommendations in Networks

Recommendation tasks in networks. Ranking algorithms. Neighborhood methods. Heterogeneous network methods.

Reading: Aggarwal, Ch. 2.7 and 10

3/9 (Week 10): Learning to Rank

Reading: Aggarwal, Ch. 13.2 and TBA

3/16 (Finals Week): No class

Due: Final report

Due: Quiz 3

Course Policies

Class time is valuable! Please turn off cell phones and other potentially disruptive devices, and do not use laptop computers in class. Please do not arrive late or leave early from class without prior notification of the instructor. It is your responsibility to make it to class on time. Students are expected to attend all classes and participate in in-class discussion. Class will start promptly at 5:45 pm. Students are responsible for material they may have missed due to absence or tardiness.

Assignments will be submitted online via D2L. Do not submit assignments by email. **All assignments should be completed and submitted by 11:59 pm on the due date.** Students have a total of four late days that can be used for any assignment or project milestone, except designated milestones.

A professional and academic attitude is expected throughout this course. Measurable examples of non-academic or unprofessional attitude include but are not limited to: talking to others when the instructor is speaking, mocking another's opinion, cell phones ringing, emailing, texting or using the internet whether on a phone or computer. If any issues arise a student may be asked to leave the classroom. The professor will work with the Dean of Students Office to navigate such student issues.

DePaul University is a community that thrives on open discourse that challenges students, both intellectually and personally, to be socially responsible leaders. It is the expectation that all dialogue in this course is civil and respectful of the dignity of each student. Any instances of disrespect or hostility can jeopardize a student's ability to be successful in the course. The professor will partner with the Dean of Students Office to assist in managing such issues.

Email is the primary means of communication between faculty and students enrolled in this course outside of class time. Students should be sure their email listed under "demographic information" at <http://campusconnect.depaul.edu/> is correct.

University Policies

Changes to Syllabus

This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be thoroughly addressed during class, posted under Announcements in D2L and sent via email.

Online Course Evaluations

Instructor and course evaluations provide valuable feedback that can improve teaching and learning. The greater the level of participation, the more useful the results. As students, you are in the unique position to view the instructor over time. Your comments about what works and what doesn't can help faculty build on the elements of the course that are strong and improve those that are weak.

Academic Integrity and Plagiarism

This course will be subject to the academic integrity policy passed by faculty. More information can be found at <http://academicintegrity.depaul.edu/>.

The university and school policy on plagiarism can be summarized as follows: Students in this course should be aware of the strong sanctions that can be imposed against someone guilty of plagiarism. If proven, a charge of plagiarism could result in an automatic F in the course and possible expulsion. The strongest of sanctions will be imposed on anyone who submits as his/her own work any assignment which has been prepared by someone else. If you have any questions or doubts about what plagiarism entails be sure to consult the instructor. While students are permitted to discuss assignments at the conceptual level, under no circumstances should students share specific answers (electronically or otherwise).

Withdrawal

Students who withdraw from the course do so by using the Campus Connection system (<http://campusconnect.depaul.edu>). Withdrawals processed via this system are effective the day on which they are made. Simply ceasing to attend, or notifying the instructor, or nonpayment of tuition, does not constitute an official withdrawal from class and will result in academic as well as financial penalty.

Retroactive Withdrawal

This policy exists to assist students for whom extenuating circumstances prevented them from meeting the withdrawal deadline. During their college career students may be allowed one medical/personal administrative withdrawal and one college office administrative withdrawal, each for one or more courses in a single term. Repeated requests will not be considered. Submitting an appeal for retroactive withdrawal does not guarantee approval. College office appeals for CDM students must be submitted online via MyCDM. The deadlines for submitting appeals for this quarter is the last day of the last final exam of Winter Quarter 2014.

Excused Absence

In order to petition for an excused absence, students who miss class due to illness or significant personal circumstances should complete the Absence Notification process through the Dean of Students office. The form can be accessed at <http://studentaffairs.depaul.edu/dos/forms.html>. Students must submit supporting documentation alongside the form. The professor reserves the sole right whether to offer an excused absence and/or academic accommodations for an excused absence.

Incomplete

An incomplete grade is a special, temporary grade that may be assigned by an instructor when unforeseeable circumstances prevent a student from completing course requirements by the end of the term and when otherwise the student had a record of satisfactory progress in the course. CDM policy requires the student to initiate the request for incomplete grade before the end of the term in which the course is taken. Prior to submitting the incomplete request, the student must discuss the circumstances with the instructor. Students may initiate the incomplete request process in MyCDM.

- All incomplete requests must be approved by the instructor of the course and a CDM Associate Dean. Only exceptional cases will receive such approval.
- If approved, students are required to complete all remaining course requirement independently in consultation with the instructor by the deadline indicated on the incomplete request form.
- By default, an incomplete grade will automatically change to a grade of F after two quarters have elapsed (excluding summer) unless another grade is recorded by the instructor.
- An incomplete grade does NOT grant the student permission to attend the same course in a future quarter.

Students with Disabilities

Students who feel they may need an accommodation based on the impact of a disability should contact the instructor privately to discuss their specific needs. All discussions will remain confidential.

To ensure that you receive the most appropriate accommodation based on your needs, contact the instructor as early as possible in the quarter (preferably within the first week of class), and make sure that you have contacted the Center for Students with Disabilities (CSD) at: Student Center, LPC, Suite #370 Phone number: (773)325.1677 Fax: (773)325.3720 TTY: (773)325.7296