Proposed COMP 480 Outline

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Textbooks:

1) Kumar, P. Pavan, et al. *Recommender Systems: Algorithms and Applications*. CRC Press, 2021.

2) Robillard, Martin P., et al. *An Introduction to Recommendation Systems in Software Engineering*. Springer Science and Business, 2014.

Modules:

1) **Introduction to Recommendation Systems**

Readings:

- Article: Introduction To Recommender Systems: Algorithms and Evaluation by Joseph A.Konstan University of Minnesota
- An Introduction to Recommendation Systems in Software Engineering by Martin P. Robillard and Robert J. Walker, Chapter 1 of Recommendation Systems in Software Engineering
- Basic Approaches in Recommendation Systems by Alexander Felfernig, Michael Jeran, Gerald Ninaus, Florian Reinfrank, Stefan Reiterer, and Martin Stettinger, Chapter 2 of Recommendation Systems in Software Engineering
- Progress in recommender system research: Crisis? What crisis? By Paolo Cremonesi, Dietmar Jannach
- A Comprehensive Overview to the Recommender System Approaches, Algorithm, and Challenges by Bhuvanya, and Kavithaty, Chapter 7 of Recommender Systems: Algorithms and Applications
- Analysis of the impact of algorithms in 2 siloing users: special focus on YouTube

(10% report) Recommendation systems: Principles, Architecture, Classifications, and different types of collecting data.

(10% Python Script) Constructing recommendation systems through the implementation of content-based filtering and employing TF-IDF vectorization to propose analogous movies from IMDB's top 1000 movies dataset.

(5% Presentation)

2) **Data Mining**

Readings:

- Data Mining by Tim Menzies, Chapter 3 of Recommendation Systems in Software Engineering
- Mining Bug Data by Kim Herzig and Andreas Zeller, Chapter 6 of Recommendation Systems in Software Engineering

- A Survey on Data Mining Techniques in Recommender Systems by Maryam Khanian Najafabadi, Azlinah Hj. Mohamed, Mohd Naz'ri Mahrin
- Collecting and Processing Interaction Data for Recommendation Systems by Walid Maalej, Thomas Fritz, and Romain Robbes, Chapter 7 of Recommendation Systems in Software Engineering
- "Big Data and Social Media Analytics." *SpringerLink*, link.springer.com/book/10.1007/978-3-030-67044-3. Accessed 15 June 2023.
- "An Introduction to Data Mining in Social Networks." *Advanced Data Mining Tools and Methods for Social Computing*, 4 Feb. 2022, www.sciencedirect.com/science/article/abs/pii/B9780323857086000084.

(10 % report) Data Mining: Investigating different data mining techniques and application

(10% Python Script) Develop data mining techniques to conduct trend analysis, correlation analysis, and cluster analysis on COVID-19 data, alongside sentiment analysis specifically targeting YouTube data.

(5% Presentation)

3) Collaborative Filtering

Readings:

- Collaborative filtering-based robust recommender system using machine learning algorithms by Utkarsh Pravind, Palak Porwal, Abhaya Kumar Sahoo, Chittaranian Pradhan, Chapter 1 of Recommender Systems: Algorithms and Applications
- Recommender Systems for the Social Networking Context for Collaborative Filtering and Content-based Approaches by Lakshmi Patibandla, Lakshman Narayana, Arepalli Peda Gopi, Tarakeswara Rao, Chapter 5 of Recommender Systems: Algorithms and Applications
- Collaborative Filtering Techniques: Algorithms and Advances by Pallavi Mishra, Sachi Nandan Mohanty, Chapter 8 of Recommender Systems: Algorithms and Applications

(10 % report) Collaborative Filtering: Baseline Prediction Model, Model-Based Filtering with Advances, Memory-Based Model with Advances.

(10% Python Script) Constructing a recommendation system through the integration of collaborative filtering techniques and leveraging the YouTube API to retrieve and establish a database, which will facilitate the implementation of sentiment analysis on the acquired data.

(5% presentation)

4) Software Understanding for Comp400

Reading:

- Re-evaluating Radical content pathways in the YouTube Recommendation System by Mika Desblancs https://github.com/mika-jpd/YouTube_Radicalization_Recommendations

- "View of Algorithmic Extremism: Examining YouTube's Rabbit Hole of Radicalization: First Monday." *View of Algorithmic Extremism: Examining YouTube's Rabbit Hole of Radicalization | First Monday*, firstmonday.org/ojs/index.php/fm/article/view/10419/9404. Accessed 7 Aug. 2023.

(10 % Python Script) Replicating, modifying, and adapting Mika Desblancs's Python model based on the knowledge obtained in the prior modules.

(10% report) Investigating the siloing effect on YouTube by inducing a rabbit hole phenomenon, comprehending the overview of the underlying mechanisms of the YouTube algorithm, and conducting an in-depth exploration of research studies concerning its potential biasness.

(5% presentation)