Papers for final project and guidelines:

You can select any paper related to social choice, and write it here:
https://docs.google.com/spreadsheets/d/1au9IA5Ikjdt7_1vaxtcbDt4PJsQFznrCBocpQRz2ay4/edit?usp=sharing
Do not start working before I approve the selection.

How to select a paper?
- I provide a list of some relevant papers below.
- You may also select any other paper with at least 30 citations on Google Scholar.
    - Preferable to select a conference paper (typically 6-8 pages).
    - You can also select a longer paper, in which case choose a section/chapter from the paper (I need to approve the selection).
    - Do not select survey articles or book chapters.
    - You may select a paper that was mentioned in class (if we only covered part of it), but the material covered in class will not be part of the project.
    - Also possible to select a followup paper (use Google Scholar)
- You may submit in pairs, but then I set higher standards for the project.
- You may work on the same paper as other students/pairs, as long as you work independently
- Deadlines:
    - Select a paper by 13/1/2020 (you can start now)
    - Submit part 1 by 2/2   (if you submit by 22/1 you will get early feedback so you can start part 2)
    - Submit part 2 by 12/3

What does part 1 (paper summary) include?

- Paper title and authors, where was the published
- What is the topic of the paper? What is the main claim? (E.g. "X may cause Y", "Algorithm A is a good solution to problem P", "Mechanism M has a major problem", "Data of type D is required to understand system S", and so on)
- What are the main 1-2 results in the paper?
    - Write them down as formally as possible, with all the required definitions
- Add a figure/table that are not included in the paper, that can help clarify some of the definitions/results/proofs
- Select one paper cited in your paper as an important paper, and explain (1-2 sentences) why it is cited.
- Find (use Google Scholar) 1 paper citing your paper, and explain why it is cited.
- The summary should be 2-3 pages, printed only (not in handwrite)
- Include in a separate file the plan for your project
- Summary may be in Hebrew or in English
- **Bonus 2 points if you submit in Latex**

What does part 2 (project) include?
First you need to decide if you go for a research project or an implementation project. You need to decide this before you select the paper, so you can select an appropriate paper (e.g. if you want to implement an algorithm, select an algorithmic paper. If you want a research project, better select a recent paper). **3 bonus points for submission of a Jupyter Notebook.**

An implementation project: Write and run code that demonstrates some of the issues in the paper. For example, implement the algorithm(s) and run on simulated data or a dataset from the web (or data you collect on your own). Compare 2 or more algorithms. Write a simulation that supports (or not) a theoretical claim in the paper, and so on.
The project will include all the source and data files, and a 1-3 pages description of what you did with a clear summary of the results. Grade will be based on the scale, difficulty, originality, quality and presentation of the project.

A research project:
- Write a paragraph of critique on the paper: what can you say about the model, the assumptions, the scope of the results, etc.?
- Extend the results in the paper in some way. e.g. prove a stronger claim under some additional assumptions, extend the result to a domain that is not covered in the paper, improve the algorithm for some specific case, and so on. Submit a 1-3 page summary with a formal statement of your research statement/theorem/claim, and how you support it with a proof (or proof attempt)/simulation/experiment. Grade will be based on the clarity of presentation and quality of work. A high grade is possible even if the scientific contribution is small. I will also take your background into account.

איך לבחור מאמר: ניתן לבחור כל מאמר שהוזכר בכתה, או מופיע ברשימה, או מאמר אחר עם לפחות 30 ציטוטים בגוגל סקולר, הקשור לתוכן הקורס. אין לבחור מאמרי סקירה או פרקים מספר. ניתן לבחור מאמר קצר (נניח עד 12 עמודים) או פרק מתוך מאמר ארוך יותר. ניתן לעבוד בזוגות, אך אצפה לפרויקט בהיקף גדול יותר.

הוראות לחלק 1 (סיכום): יש לרשום את כותרת המאמר, מחברים והיכן פורסם. מה נושא המאמר? מה הטענה המרכזית?
יש לבחור את התוצאה-שתיים העיקריות במאמר ולרשום אותן באופן פורמלי כולל ההגדרות הנדרשות.
יש להוסיף איור\טבלה *שאינו מופיע במאמר המקורי* ומבהיר משהו לגבי המודל \ הגדרות \תוצאות וכו'.
יש לבחור מאמר מצוטט ולהסביר למה הוא צוטט
יש למצוא (בעזרת גוגל סקולר) מאמר שמצטט את המאמר הזה ולהסביר למה הוא צוטט
יש להגיש את הסיכום מודפס בעברית או באנגלית, 2-3 עמודים. בונוס 2 נקודות על הגשה ב Latex להסביר (בקובץ נפרד) מה אתם מתכוונים לעשות בחלק 2.

הוראות לחלק 2 (פרויקט מעשי): לממש אלגוריתם אחד או יותר מהמאמר (ו\או ממאמרים קשורים), להריץ על דאטה רלוונטי (להשיג דאטה מהרשת או לאסוף בעצמכם) ולהציג את התוצאות בצורה ברורה. ניתן גם לכתוב קוד משלכם שאינו מימוש של אלגוריתם מהמאמר אבל ממחיש נושא כלשהו מהמאמר.

Papers

Dwork, Cynthia, et al. "Rank aggregation methods for the web." *Proceedings of the 10th international conference on World Wide Web.* ACM, 2001.

Ailon, Nir. "Aggregation of partial rankings, p-ratings and top-m lists." *Algorithmica* 57.2 (2010): 284-300.

Cook, W. D., Golany, B., Penn, M., & Raviv, T. (2007). Creating a consensus ranking of proposals from reviewers' partial ordinal rankings. *Computers & Operations Research*, *34*(4), 954-965.

Mattei, Nicholas, James Forshee, and Judy Goldsmith. "An empirical study of voting rules and manipulation with large datasets." *Proceedings of COMSOC* (2012): 59.

Ballester, Miguel A., and Guillaume Haeringer. "A characterization of the single-peaked domain." Social Choice and Welfare 36.2 (2011): 305-322.

Anshelevich, Elliot, and John Postl. "Randomized social choice functions under metric preferences." *Journal of Artificial Intelligence Research* 58 (2017): 797-827.

Procaccia, Ariel D., Aviv Zohar, and Jeffrey S. Rosenschein. "Automated design of scoring rules by learning from examples." *Proceedings of the 7th international joint conference on Autonomous agents and multiagent systems-Volume 2.* International Foundation for Autonomous Agents and Multiagent Systems, 2008.

Procaccia, Ariel D., et al. "Learning voting trees." *PROCEEDINGS OF THE NATIONAL CONFERENCE ON ARTIFICIAL INTELLIGENCE*. Vol. 22. No. 1. Menlo Park, CA; Cambridge, MA; London; AAAI Press; MIT Press; 1999, 2007.

Lu, Tyler, and Craig Boutilier. "Multi-winner social choice with incomplete preferences." *Twenty-Third International Joint Conference on Artificial Intelligence*. 2013.

Caragiannis, Ioannis, et al. "On the approximability of Dodgson and Young elections." *Artificial Intelligence* 187 (2012): 31-51.

Strategic voting:

Procaccia, Ariel D., and Jeffrey S. Rosenschein. "Junta distributions and the average-case complexity of manipulating elections." *Journal of Artificial Intelligence Research* 28 (2007): 157-181.

Zuckerman, Michael, Ariel D. Procaccia, and Jeffrey S. Rosenschein. "Algorithms for the coalitional manipulation problem." *Artificial Intelligence* 173.2 (2009): 392-412.

Conitzer, Vincent, and Tuomas Sandholm. "Nonexistence of voting rules that are usually hard to manipulate." *AAAI*. Vol. 6. 2006.

Elkind, Edith, et al. "Gibbard–satterthwaite games." *Twenty-Fourth International Joint Conference on Artificial Intelligence*. 2015.

Feldman, Michal, Amos Fiat, and Iddan Golomb. "On voting and facility location." *Proceedings of the 2016 ACM Conference on Economics and Computation*. ACM, 2016.

Grandi, Umberto, et al. "Restricted manipulation in iterative voting: Condorcet efficiency and borda score." *International Conference on Algorithmic DecisionTheory*. Springer, Berlin, Heidelberg, 2013.

Elkind, Edith, et al. "Equilibria of plurality voting: Lazy and truth-biased voters." *International Symposium on Algorithmic Game Theory*. Springer, Berlin, Heidelberg, 2015.

Lev, Omer, and Jeffrey S. Rosenschein. "Convergence of iterative scoring rules." *Journal of Artificial Intelligence Research* 57 (2016): 573-591.

Rabinovich, Zinovi, et al. "Analysis of equilibria in iterative voting schemes." *Twenty-Ninth AAAI Conference on Artificial Intelligence*. 2015.

Obraztsova, Svetlana, et al. "On the convergence of iterative voting: how restrictive should restricted dynamics be?." *Twenty-Ninth AAAI Conference on Artificial Intelligence*. 2015.

Reyhani, Reyhaneh, and Mark Wilson. "Best-reply dynamics for scoring rules." *20th European Conference on Artificial Intelligence*. IOS Press, 2012.

Brânzei, Simina, et al. "How bad is selfish voting?." *Twenty-Seventh AAAI Conference on Artificial Intelligence*. 2013.

Learning preference structures

Lu, Tyler, and Craig Boutilier. "Vote elicitation with probabilistic preference models: Empirical estimation and cost tradeoffs." *International Conference on Algorithmic DecisionTheory*. Springer, Berlin, Heidelberg, 2011.

Oren, Joel, Yuval Filmus, and Craig Boutilier. "Efficient vote elicitation under candidate uncertainty." *Twenty-Third International Joint Conference on Artificial Intelligence*. 2013.

Lu, Tyler, and Craig Boutilier. "Learning Mallows models with pairwise preferences." *Proceedings of the 28th international conference on machine learning (icml-11)*. 2011.

Soufiani, Hossein Azari, David C. Parkes, and Lirong Xia. "Preference elicitation for General Random Utility Models." *Proceedings of the Twenty-Ninth Conference on Uncertainty in Artificial Intelligence*. AUAI Press, 2013.

Crowdsourcing / Truth discovery

Kosinski, Michal, et al. "Crowd IQ: Measuring the intelligence of crowdsourcing platforms." *Proceedings of the 4th annual ACM web science conference*. ACM, 2012.

Caragiannis, Ioannis, Ariel D. Procaccia, and Nisarg Shah. "Modal ranking: A uniquely robust voting rule." *Twenty-Eighth AAAI Conference on Artificial Intelligence*. 2014.

Mao, Andrew, Ariel D. Procaccia, and Yiling Chen. "Better human computation through principled voting." *Twenty-Seventh AAAI Conference on Artificial Intelligence*. 2013.

Ben-Yashar, Ruth, and Jacob Paroush. "Optimal decision rules for fixed-size committees in polychotomous choice situations." *Social Choice and Welfare* 18.4 (2001): 737-746.

Prelec, Dražen, H. Sebastian Seung, and John McCoy. "A solution to the single-question crowd wisdom problem." *Nature* 541.7638 (2017): 532.

Voting experiments
Laslier, Jean-François. "In silico voting experiments." Handbook on approval voting. Springer, Berlin, Heidelberg, 2010. 311-335.

Van der Straeten, Karine, et al. "Strategic, sincere, and heuristic voting under four election rules: an experimental study." Social Choice and Welfare 35.3 (2010): 435-472.

Fairstein, Roy, et al. "Modeling People's Voting Behavior with Poll Information." *Proceedings of the 18th International Conference on Autonomous Agents and MultiAgent Systems*. International Foundation for Autonomous Agents and Multiagent Systems, 2019.

Tyszler, Marcelo, and Arthur Schram. "Information and strategic voting." *Experimental economics* 19.2 (2016): 360-381.