CO 750-1 Paper report and presentation

Expectations: I expect you to

- choose one of the papers listed below **(due June 29)**,
- give a 25 minute long talk on the paper **(July 26-27 at 10am in MC 5479)**,
- write a 6-8 page long report on the topic (typed, 12pt font) **(due August 4)**.

Remember, this is worth 30% of your final grade.

Choosing the paper: Once you decide on the paper, please *confirm* it by me to make sure that no one else has taken the paper. You may of course pick a paper outside the list, but you will need my confirmation. If you need help with choosing the paper, do not hesitate to talk to me. I am more than happy to give you an overview of the paper.

The presentation: In 25 minutes, I expect you to motivate the topic of the paper to the general audience, put it in context, explain the results, and give some technical details about the paper. If you are not comfortable with giving talks, or you have not had enough practice, it is definitely better to use the projector rather than the board. It is not easy to cover everything in 25 minutes using the board. I expect you to attend all the talks.

The report: The paper should be typed. In 6-8 pages, I expect you to put the paper in context, give a broad overview of the results of the paper, prove some of the results of the paper (so that I know you have understood more or less what the paper is about), and add your own concluding thoughts on the results, how the paper was written, what you think should be done in the future, etc.

Balanced matrices

1. Conforti and Cornuejols. Balanced $0, \pm 1$ matrices, bicoloring and total dual integrality. Math Programming 71, 249-258 (1995).
2. Cornuejols. Combinatorial optimization: packing and covering. Chapter 7 (signing 0,1 matrices to be TU or balanced). SIAM 95–106 (2001).

Perfect matrices

1. Padberg. Perfect zero-one matrices. Math Programming 6, 180-196 (1974).
2. Chvatal and Sbihi. Bull-free Berge graphs are perfect. Graphs and Combinatorics 3, 127-139 (1987).
3. Chudnovsky, Lagoutte, Seymour, Spirkl. Colouring perfect graphs with bounded clique number. J. Combinatorial Theory, Ser B 122, 757-775 (2017).

Ideal matrices

1. Lehman. A solution of the Shannon switching game. J. Soc. Indust. Appl. Math. 12 (4), 687-725 (1964).
2. Seymour. On multi-colourings of cubic graphs, and conjectures of Fulkerson and Tutte. Proc. London Math. Soc. (3) 38, 423-460 (1979).
3. Lovasz. Matching structure and the matching lattice. J. Combinatorial Theory, Ser B 43(2), 187-222 (1987).
4. Cornuejols, Guenin, Margot. The packing property. Math Programming 89(1), 113-126 (2000).
5. Cai, Deng, Zang. A min-max theorem on feedback vertex sets. Math Oper. Res. 27(2), 361-371 (2002).
6. Guenin. A short proof of Seymour's characterization of the matroids with the max-flow min-cut property. J. Combinatorial Theory, Ser B 86, 273-279 (2002).
7. Ding, Feng, Zang. The complexity of recognizing linear systems with certain integrality properties. Math Programming Ser A 114, 321-334 (2008).
8. Cornuejols and Novick. Ideal $0, 1$ matrices. J. Combinatorial Theory, Ser B 60, 145-157 (1994). In conjunction with: Wang. A new infinite family of minimally non-ideal matrices. J. Combinatorial Theory, Ser A 118(2), 365-372 (2011).

Cycle double covers

1. Alspach, Goddyn, Zhang. Graphs with the circuit cover property. Transactions of AMS 344(1), 131-154 (1994).

2. Brinkmann, Goedgebeur, Hagglund, Markstrom. Generation and properties of snarks. J. Combinatorial Theory, Ser B 103(4), 468-488 (2013).