Seminar on
“Graphs, Algorithms & Optimization”

G. Sagnol

TU Berlin

April 30, 2020

Important dates

Attendance of all participants is expected at all meetings !

- 23.4.2020: first meeting
  - Presentation of topics
- **30.4.2020: second meeting**
  - ~~*If required, draw 16 participants at random*~~.
  - Guidelines for presentations
  - Assignment of topics
- 28.5.2020: 5-minute presentations
  - Short introduction into topic and main results
- ~~17.6.2020~~ 24.6.2020: Final slides due
- ~~25–26.6.2020~~ 02.7.2020: Seminar TU Berlin

Selected Papers

1. Englert, M., Mezlaf, D., & Westermann, M. (2018). **Online makespan scheduling with job migration on uniform machines**. In 26th Annual European Symposium on Algorithms (ESA 2018)
2. Lattanzi, S., Lavastida, T., Moseley, B., & Vassilvitskii, S. (2020). **Online Scheduling via Learned Weights**. In Proceedings of the Fourteenth Annual ACM-SIAM Symposium on Discrete Algorithms (pp. 1859-1877)
3. Garg, N., Gupta, A., Kumar, A., Singla, S. (2019). **Non-clairvoyant Precedence Constrained Scheduling**. In 46th International Colloquium on Automata, Languages, and Programming (63)
4. Bougeret, M., Pessoa, A. A., & Poss, M. (2019). **Robust scheduling with budgeted uncertainty**. Discrete Applied Mathematics, 261, 93-107
5. Roy, A., & Pokutta, S. (2017). **Hierarchical clustering via spreading metrics**. The Journal of Machine Learning Research, 18(1), 3077-3111
6. Cohen-Addad, V., Kanade, V., Mallmann-Trenn, F., & Mathieu, C. (2019). **Hierarchical clustering: Objective functions and algorithms**. Journal of the ACM (JACM), 66(4), 1-42.
7. Charikar, M., Chatziafratis, V., & Niazadeh, R. (2019). **Hierarchical clustering better than average-linkage**. In Proceedings of the Thirtieth Annual ACM-SIAM Symposium on Discrete Algorithms (pp. 2291-2304).
8. Iwata, S., Tetali, P., & Tripathi, P. (2012). **Approximating minimum linear ordering problems**. In Approximation, Randomization, and Combinatorial Optimization. Algorithms and Techniques (pp. 206-217).
9. Angel, E., Bampis, E., & Gourvès, L. (2006). **Approximation algorithms for the bi-criteria weighted MAX-CUT problem**. Discrete Applied Mathematics, 154, 1685–1692.
10. Torrico, A., Singh, M., & Pokutta, S. (2019). **On the Unreasonable Effectiveness of the Greedy Algorithm: Greedy Adapts to Sharpness**. In Proceedings of the OPTML19 Workshop, paper 16.
11. Andoni, A., Gupta, A., & Krauthgamer, R. (2014, January). **Towards (1+ϵ)-Approximate Flow Sparsifiers**. In Proceedings of the twenty-fifth annual ACM-SIAM symposium on Discrete algorithms (pp. 279-293).
12. Frascaria, D. & Olver, N. (2020). **Algorithms for flows over time with scheduling costs**. IPCO 2020
13. Gallo, G., Grigoriadis, M. D., & Tarjan, R. E. (1989). **A fast parametric maximum flow algorithm and applications**. SIAM Journal on Computing, 18(1), 30-55.
14. Su, W., Boyd, S., & Candes, E. (2014). **A differential equation for modeling Nesterov's accelerated gradient method: Theory and insights**. In Advances in Neural Information Processing Systems (pp. 2510-2518).
15. Fercoq, O., Gramfort, A., & Salmon, J. (2015, June). **Mind the duality gap: safer rules for the Lasso**. In International Conference on Machine Learning (pp. 333-342).
16. Mairal, J., & Yu, B. (2012, June). **Complexity analysis of the lasso regularization path**. In Proceedings of the 29th International Conference on Machine Learning (pp. 1835-1842).

Your Talk

- Time: exactly 40 min (+ 5min. for questions)
  - no outline on separate slide necessary
  - about 10-15 min introduction
    - Do not forget to situate the paper within literature
  - about 25-30 min results and proof ideas
    - Focus / Amount of details may depend on paper length !
  - about 5 min conclusion
- Media:
  - LaTeX-beamer, Keynote, Prezi, Powerpoint, etc.
- Goal:
  - Understandability (everyone should be able to understand everything)

Layout

- per slide: small pieces of information that are easy to digest
  - $\leq$ 30 words! (better $\leq$20)
  - $\leq$ 10 words at once! (better $\leq$5)
- “perfect” layout
  - no distractions (transitions only where helpful)
  - no typos
  - consistency, e.g., in use of upper/lowercase symbols
- avoid massive use of math symbols (if necessary use blackboard)

Layout (continued)

- use figures wherever possible
  - rule of thumb: (almost) no slide without a figure!
- definitions / algorithms / examples by picture
- saturated colours (no yellow)
- highlight **important stuff**
- we do not require a handout
  - we expect flawless slides
- your explanation must be represented by the slides

Storyline

- at every stage of the talk it should be clear
  - what is our aim?
  - what do we know already?
  - what do we still have to show?
- try to reflect these questions in
  - layout of slides
  - language
  - repetition
  - running examples
- rule of thumb: first intuition, then formalisation
- examples, examples, examples, and counterexamples

Language

- use language to structure your talk
  - breaks
  - emphasis
  - repetition
  - make clear, precise and concise statements
- language should not distract
  - be calm (use language and gestures instead of a laser pointer)
  - variety is good (use intonation breaks)
  - address the audience (not the wall)
- you are the main attraction, not your slides

Practice

- you need to practice a lot
- practice loud with your slides (best: with projector)
- do no learn by heart (except the first three statements)
- rule of thumb: practice the full talk at least 3 times
  - until you feel safe
- excitement is good
- we will ask questions, when sth. is not clear
  - be prepared!

Evaluation

- your grade reflects you own work
  - story
    - storyline
    - selection of presented material
    - knowledge of the paper
  - layout
    - structure
    - figures
    - clarity
  - presentation
    - eye contact and language