LITERATURE SUMMARIES

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Two Approximation Algorithms for 3-Cycle Covers [1] introduces the topic, provides 2 algorithms for computing 3-cycle covers from maximum 2-cycle covers, and an algorithm combining them. Then Baser et al. prove that Max-3-DCC is APX-complete.

Minimum-weight Cycle Covers and Their Approximability [2] provides a good summary on approximability for minimum and maximum weight cycle covers. First, I learned that Min-D-DCC is known as the assignment problem, which is likely what we need for the basic Offer Network. Results for a constant factor approximation for L-cycle (general) covers for maximum weight are presented and proven, yet the minimum case is harder. These approximations need the triangle inequality.

Read *From Graph Matching Problem to Assignment Problem slides*[1]. Good overview and visual explanation of assignment problem. Not clear how to use for ONs.

MIT *Lecture Notes on Bipartite Matching*[2] cover the minimum weight perfect matching set-up (which then reduces to minimum-cost flow if desired), duality with vertex covers (not vertex cycle covers), and some algorithms to solve them.

MIT *Advanced Methods in Algorithms HW 5*[3] explains how to use perfect matching in a bipartite graph to find a vertex-disjoint cylce cover, basically, in ON terminology, by duplicating each task and having an "offer" and a "request" side to turn the directed graph into an undirected graph.

Expertise Matching via Constraint-Based Optimization [3] discusses the problem of matching experts to problems while taking account of various constraints: load balancing, spreading top-level experts among problems, etc. Provide convex min-cost flow problem formulation. Also a way to correct the matching online via user feedback, potentially useful in the case one user in a proposed match (in an ON) declines and others agree!

Open-WBO: a Modular MaxSAT Solver[4] provisdes a good brief introduction to what weighted boolean optimization is, and the approaches taken.

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1 http://romain.raveaux.free.fr/document/FromGraphMatchingToAssignmentProblem.pdf
2 http://math.mit.edu/~goemans/18433S09/matching-notes.pdf
3 https://courses.cs.ut.ee/MTAT.03.286/2014_fall/uploads/Main/Solutions-HW5-fall2014
4 http://baldur.iti.kit.edu/sat2014/slides/52.pdf

REFERENCES

[1] Markus Bläser and Bodo Manthey. Two approximation algorithms for 3-cycle covers. In *Proceedings of the 5th International Workshop on Approximation Algorithms for Combinatorial Optimization*, APPROX '02, pages 40–50, London, UK, UK, 2002. Springer-Verlag.

[2] Bodo Manthey. Minimum-weight cycle covers and their approximability. *CoRR*, abs/cs/0609103, 2006.

[3] Wenbin Tang, Jie Tang, and Chenhao Tan. Expertise matching via constraint-based optimization. In *Proceedings of the 2010 IEEE/WIC/ACM International Conference on Web Intelligence and Intelligent Agent Technology - Volume 01*, WI-IAT '10, pages 34–41, Washington, DC, USA, 2010. IEEE Computer Society.