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Approximationsalgorithmen für das Traveling Tournament Problem

In this talk we present an approximation for the Traveling Tournament Problem which is the problem of designing a schedule for a sports league consisting of a set of teams T such that the total traveling costs of the teams are minimized. Thereby, it is not allowed for any team to have more than k home-games or k away-games in a row. We propose an algorithm which approximates the optimal solution by a factor of

$$2 + 2k/n + k/(n-1) + 3/n + 3/(2 \cdot k)$$

which is not more than 5.875 for any choice of $k \geq 4$ and $n \geq 6$. This is the first constant factor approximation for $k > 3$. We furthermore show that this algorithm is also applicable to real-world problems as it produces solutions of high quality in a very short amount of time. It was able to find solutions for a number of well known benchmark instances which are even better than the previuosly known ones.