COST Action IC1205 on Computational Social Choice: STSM Report

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During the week I spent in Tübingen visiting Britta Dorn, we discussed a control problem concerning fair allocations. Deviating somewhat from our original plans, we mainly focused on the following setting: given a set of agents and a set of items, with each agent having a strict linear preference ordering over the items, we seek for a smallest set of items whose removal guarantees the existence of a proportional allocation in the remaining instance.

This problem is can be solved in polynomial time using an algorithm by Brams, Kilgour and Klamler, and it was clear to us (already prior to my visit) that the case of unbounded number of agents is NP-hard and even W[2]-hard when parameterized by the number of items that we are allowed to remove. Hence, we studied the case of three agents, which turned out to be more involved than for two agents but still polynomial-time solvable. We also discussed some ideas to generalize this result to the case where the number of agents is a constant. Currently we are in the process of writing up our results.

Another important result of my visit with Britta was that we decided to accept the invitation of Ulle Endriss to write a chapter about parameterized complexity in the book "Trends in Computational Social Choice" which he is working on. We prepared a rough outline for the chapter, and tried to resolve the most important questions about methodology. We came to an understanding that we want this introduction to parameterized algorithms to be accessible for all researchers within the area of computational social choice.