

COST Action IC1205 Computational Social Choice: STSM Report

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I was hosted for two weeks by Prof. Ariel Procaccia at Carnegie Mellon University. During this period we mostly worked on two problems:

The first had to do with finding a good strategy-proof variant for the newly proposed NSF mechanism. The proposed NSF mechanism works by having the researchers who submit proposals also be those who rank the proposals, with incentives offered to those who are closest to to the amalgamation of all graders. This system is quite obviously not strategy-proof, as ranking strong proposals low increases one's odds of getting accepted. We attempted to craft a strategy-proof version by dividing the participants into groups, and having each of them influence the decision and ranking only of proposals from other groups. In such a mechanism, a participant cannot change its own fate by manipulating the ranking it was asked to do. While this is, naturally, strategy-proof, the bigger challenge of this problem is showing that the resulting winners are good candidates. This isn't done by comparing to the NSF proposal benchmark, but to an idealized underlying graph, which includes all participants' opinions on all proposals.

The second problem we engaged with had to do with division of indivisible goods. Just as the cut & choose mechanism allows two players to receive a maximin of all divisions (i.e., each participant examines, for each possible division, the value of the worst bundle for it, and maximizes this across all divisions), we wondered whether it was possible to ensure each participant receives at least the value of its maximin division. While during our time together we managed to slightly progress in our understanding of the problem, ultimately, another student has shown that this hypothesis is actually incorrect, and research is now looking at approximations notions.