

## COST Action IC1205 on Computational Social Choice: STSM Report

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For five weeks, I was hosted by Lane Hemaspaandra at University of Rochester. My visit was founded partly by the Deutsche Forschungsgemeinschaft (under grant ER 738/1-1) and partly by COST Action IC 1205 on Computational Social Choice. During these five weeks I was collaborating with Edith Hemaspaandra from Rochester Institute of Technology and with my host Lane Hemaspaandra. We were mostly working on the following problem.

Traditionally, the complexity of manipulative attacks on the outcome of an election—such as manipulation, bribery, and control—is studied under the full information assumption, where it is assumed that the dishonest party knows the set of candidates, the votes of all nonmanipulative voters, and the voting rule. Recently, Elkind and I introduced manipulation under voting rule uncertainty, which means that there are two or more rules that may be used to determine the election's outcome.

During my visit, we were working on completing the picture on manipulative attacks under voting rule uncertainty, i.e., analyzing different voting rules and classes of voting rules from a complexity-theoretic perspective and extended the scope of this research direction to bribery and control. Among our highlights are that we show a new case in which ties matter, we link manipulation and bribery in a way that shows many cases of single-bribery to be in polynomial time, we explore the relations between the bribery and control complexities of the underlying systems and their uncertain combination, and we obtain many results about the complexity of natural voting rules under voting-rule uncertainty, most notably regarding control by adding voters under election families of the form  $\{k_1 - \text{Approval}, \dots, k_\ell - \text{Approval}, \hat{k}_1 - \text{Veto}, \dots, \hat{k}_\ell - \text{Veto}\}$ .

The results have been conference-submitted and are currently under review.

We were also discussing other problems, which are in a very preliminary stage yet, but we intend to work on them in a close collaboration in the future.

On 23 September 2013 I gave a departmental seminar with the title *Algorithms and Elections*.