Elicitation and Explanation in Social Choice Theory

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16 May 2019

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Ph.D. Proposal: Goal

Develop procedures able to help a committee (or a society) choose a suitable voting rule

Involves:

- Axiomatic analysis of voting rules
- Explanation of axioms in non-expert terms
- Preference elicitation methods

Ph.D. Proposal: Approach

Idea: Automatically find properties which are incompatible

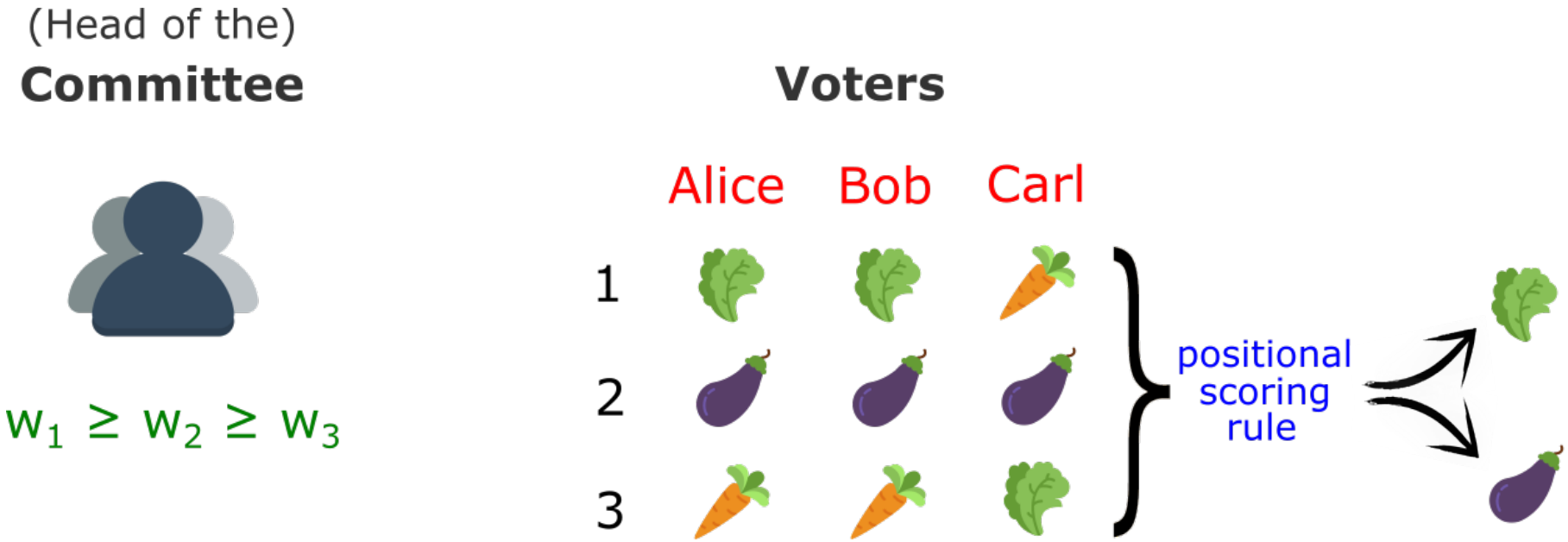
The inconsistencies proofs should be translated to non-expert terms and used for:

- querying the user and infer her preferences depending on her answers
- showing the user that she cannot have everything
- validate whether some choices are "better" than others

More generally: Work on elicitation procedures related to social choice

Current Work: Simultaneous Elicitation of Committee and Voters Preferences

Setting: Incomplete profile and uncertain scoring rule



Goal: Winner determination using an incremental elicitation protocol based on minimax regret

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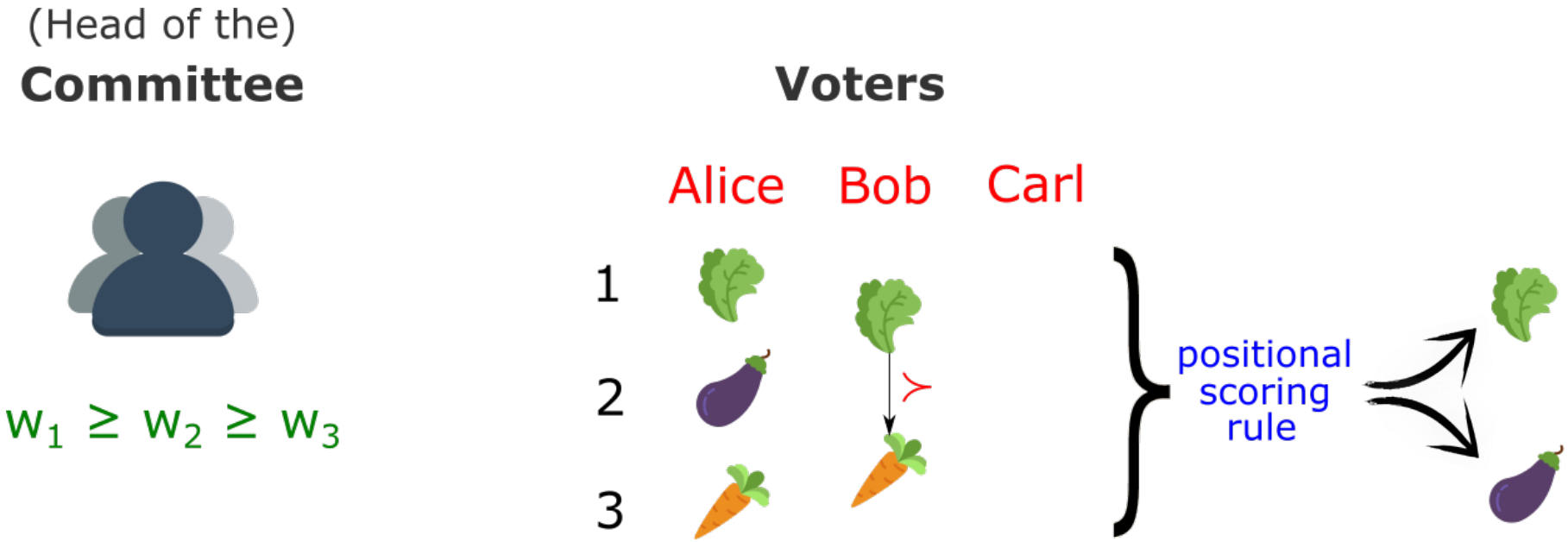

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Current Work: Related Works

Incomplete profile

- and known weights: Minimax regret to produce a robust winner approximation (*Lu and Boutilier 2011*, [2]; *Boutilier et al. 2006*, [1])

Uncertain weights

- and complete profile: dominance relations derived to eliminate alternatives always less preferred than others (*Stein et al. 1994*, [3])
- in positional scoring rules (*Viappiani 2018*, [4])

Conferences, Workshops and Summer Schools

Conferences

- Short paper regarding the work conducted with Olivier Cailloux and Paolo Viappiani accepted to RJCIA 2019 (Toulouse 1-5 July)
- Deliberation, Belief Aggregation, and Epistemic Democracy II (Neuville-sur-Oise 11-13 June)

Workshops

- Poster submission to 3rd ILLC Workshop on Collective Decision Making (Amsterdam 6-7 June)

Summer Schools

- International Summer School "Preferences, decisions and games" (Paris 25-28 June) and presentation of the current work

Academic Life

Courses Attended

- **Market Design** - prof. Sidartha Gordon, Oct-Nov 2018
- **Probabilistic Methods** - prof. Ararat Harutyunyan, Mar-May 2019

Supervisors

- Awesome people, always available and helpful
- Perfect guides
- Weekly meetings

Office

- Great relationships with all the other Ph.D. students
- Friendly and funny vibes in the lab

Goals

- Submit the current work in at least one big conference in Fall 2019
- Carry on a parallel work about the concept of compromise in bargaining
- Become fluent in French and teach from January 2020
- Visit the Louvre

Thank You!


C. Boutilier, R. Patrascu, P. Poupart, and D. Schuurmans.
Constraint-based Optimization and Utility Elicitation using the Minimax Decision Criterion.
Artifical Intelligence, 170(8–9):686–713, 2006.


Tyler Lu and Craig Boutilier.
Robust approximation and incremental elicitation in voting protocols.
In *Proceedings of IJCAI 2011*, pages 287–293, 2011.


William E. Stein, Philip J. Mizzi, and Roger C. Pfaffenberger.
A stochastic dominance analysis of ranked voting systems with scoring.
European Journal of Operational Research, 74(1):78 – 85, 1994.


Paolo Viappiani.
Positional scoring rules with uncertain weights.
In *Scalable Uncertainty Management - 12th International Conference, SUM 2018, Milan, Italy, October 3-5, 2018, Proceedings*, pages 306–320, 2018.