Arguing about voting rules

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Goal

- Voting rule: a systematic way of aggregating different opinions and decide
- Multiple reasonable ways of doing this

Our goal

We want to justify an election outcome by means of a sequence of simple arguments

Example

Who should win?

$$
\begin{aligned}
\text{Voter 1:} \quad & a \succ b \succ c \\
\text{Voter 2:} \quad & a \succ b \succ c \\
\text{Voter 3:} \quad & c \succ b \succ a
\end{aligned}
$$

- Veto rule chooses b
- Borda rule chooses a

Voter 1:	$a > b > c$
Voter 2:	$a > b > c$
Voter 3:	$c > b > a$

System: Take the *red subprofile*. Here, *a should win*, right?   [unanimity]

User: Obviously!

System: Now consider the *green subprofile*. For symmetry reasons, there should be a *three-way tie*, right?   [cancellation]

User: Sounds reasonable.

System: So, as there was a three-way tie for the green part, the red part should decide the overall winner, right?   [reinforcement]

User: Yes.

System: To summarise, you agree that a should win.

Approach

- Translate axioms into propositional logic formulas
- Build a general argumentation scheme by manipulating those formulas
- In case of Borda: solve a simple system of equations to find intermediate profiles
- Display a justification for the Borda winners from *any* starting profile

Topic of the internship

- Programming: show a justification to a user
- Integrate into Whale4
- Research: develop other (simple) argumentation schemes
- Find out interesting profiles automatically

Further information

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Bibliography

Olivier Cailloux and Ulle Endriss. 2016. "Arguing about Voting Rules". In Proceedings of the 15th International Conference on Autonomous Agents and Multiagent Systems (AAMAS-2016), IFAAMAS.
`http://www.lamsade.dauphine.fr/~ocailloux/#publications`

Thank you for your attention!

Vote for food

We have to decide which country has the best food in the universe.

Make up your mind!

61 personnes ont pris part à ce sondage.

✏ Voter   📊 Résultats

	Japanese	French	Norwegian	American	Chinese	German	Senegalese	Iranian
أحمد (Ahmad)	6	3	9	10	5	8	4	2
Jerome	3	10	1	9	5	4	6	2
Jerome	9	4	2	8	1	6	3	10
Ron	1	2	9	7	4	10	8	6