

#### Reducing Manipulability

François Durand, Fabien Mathieu, Ludovic Noirie

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# CRITERIA FOR VOTING SYSTEMS

Veto...

Borda...

Range voting, Approval, Coombs...

Plurality, Two-round, IRV, Bucklin...

Baldwin, Dodgson, Kemeny, Maximin, Nanson, Schulze, Tideman...

Set of voting systems

Informed majority coalition criterion (InfMC)

A majority may choose the outcome when they know the other votes.

Ignorant majority coalition criterion (IgnMC) A majority may choose the outcome.

Majority favorite criterion (MF)
Elects a candidate when she is preferred by a majority.

Condorcet criterion (Cond)

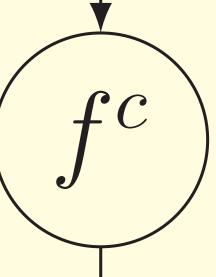
Elects the Condorcet winner when there is one.

### GOAL: MINIMIZE THE MANIPULABILITY RATE

 $\rho(f) = \mathbb{P}(\text{voting system } f \text{ is manipulable})$ 

# TRANSFORMATIONS

Initial voting system f



### Condorcification of f

- Elects Condorcet winner when she exists.
- Otherwise, same outcome as *f*.

# Best slice of $f^c$

- Depends only on orders of preference.
- Meets the Condorcet criterion.

# CONDORCIFICATION THM.

If f meets InfMC:

$$\rho(f^c) \leq \rho(f).$$

## SLICING THEOREM

If voters are independent:

$$\rho(f^{cs}) \leq \rho(f^c).$$

## CONSEQUENCES

To minimize manipulability while keeping InfMC, one may restrict to voting systems that:

- Depend only on orders of preference,
- And meet the Condorcet criterion.