Pnyx

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A powerful & user-friendly preference aggregation tool

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- ☑ Web-based
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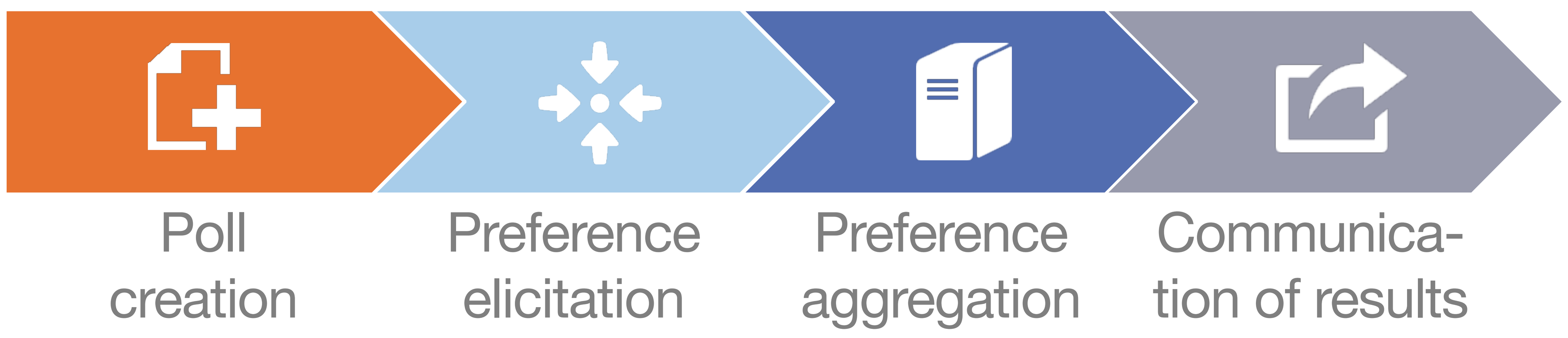
- ☑ Automatic rule selection
- ☑ Multiple preference types
- ☑ Supports the whole process of running a poll



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		Input				
		Most preferred alternative	Approved alternatives	Ranking without ties	Ranking with ties	Pairwise comparisons
Output	Unique winner	Borda's rule (= plurality winner)	Borda's rule (= approval winner)	Borda's rule		
	Lottery	Fishburn's rule (= plurality lottery)	Fishburn's rule (= approval lottery)	Fishburn's rule		
	Ranking	Kemeny's rule (= plurality ranking)	Kemeny's rule (= approval ranking)	Kemeny's rule		

The Aggregation Rules

Borda's rule: Borda's rule is a simple scoring rule that is particularly intuitive when preferences are rankings without ties [3]: each alternative receives from 0 to m - 1 points from each voter (depending on the position the alternative is ranked in), where m is the total number of alternatives. The alternative with the highest accumulated score wins. For more general cases, we consider a natural extension of Borda's rule to arbitrary binary relations where the score each voter assigned to alternative x is the number of alternatives that x is preferred to minus the number of alternatives that are preferred to x.

Fishburn's rule: The rule that we call Fishburn's rule was first considered by Kreweras [7] and independently rediscovered and studied in much more detail by Fishburn [5]. The rule returns a so-called maximal lottery, i.e., a lottery over the alternatives that is weakly preferred to any other lottery. Maximal lotteries are equivalent to mixed maximin strategies (or Nash equilibria) of the symmetric zero-sum game given by the pairwise majority margins, which allows us to use linear programming for their computation (see, e.g., Algorithm 1 by Brandt and Fischer [2]). For more details, we refer to Brandl et al. [1].

Kemeny's rule: Kemeny's rule [6] is an aggregation rule that returns a ranking of the alternatives that maximizes pairwise agreement, i.e., a ranking in which as many pairwise comparisons as possible coincide with the preferences of the voters. Alternatively, Kemeny's rule can be characterized using maximum likelihood estimation [8] or a consistency property for electorates of variable size [9]. We implemented the NP-hard problem of finding a Kemeny ranking via integer programming (following a formulation of Conitzer et al. [4]).

Why "Pnyx"?

"The Pnyx is a hill in central Athens, the capital of Greece. Beginning as early as 507 BC, the Athenians gathered on the Pnyx to host their popular assemblies, thus making the hill one of the earliest and most important sites in the creation of democracy."

(Source: Wikipedia)

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