

25 July 2017

This model contains two types of agents: electors and candidates. Electors and candidates contain a policy preference which represents their relative positions in some space. The model's user chooses the number of electors in the simulation, the number of candidates, and the range and distribution of the preferences of each agent.

The model starts by randomly assigning a preference scalar value to each elector and each candidate. Next, the model uses an inverted monotonic mapping of the distance between an elector's preference and a candidate's preference to calculate each electors' sincere utility for each candidate and then stores that in an array.

Every iteration, the model then calculates some approximation of the probability that each candidate will win (which, in this version of the model, are just the candidate's vote shares). The model first considers strategic behaviour by counting the number of electors who would cast a sincere ballot for each candidate, and then dividing by the total number of electors, yielding the proportion of sincere votes that each candidate should expect.

The electors then employ their strategic decision rule. First, they multiply their sincere utility by one minus that candidate's proportion of sincere support. This yields what we call an elector's strategic utility for each candidate. Candidates then recalculate their expected proportion of votes based on the current strategic utility values.

The model continues calculating strategic utilities, recalculating proportions, and then using those updated proportions to iteratively update the strategic utilities until the set of all strategic utilities is identical for two consecutive steps of the model. The model takes the rule that once all the candidates' winning probabilities remain identical for 2 steps, it stops. At this point it is considered to have hit its final result.

The main output of the model is the initial and final expected vote proportions of the candidates.