Eurovision Song Contest voting systems: project proposal

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1 Literature review

There has been a lot of research focused on the Eurovision Song Contest (ESC), mostly focusing on voting bias and/or collusion. These researchers attempted to find the cause of bias in each case, each using different methods to arrive at the same conclusion: some countries are indeed biased towards each other, for varying reasons [1] [2] [3]. However, there has been no research yet concerning the current voting system's intricacies, nor has there been any research which evaluates the different iterations of the voting systems used and how these changes have influenced results.

2 Research question

Primary question: How are ESC results affected by the voting rule used?

Follow up: For an iteration of the ESC, is there a voting rule which would have changed the final outcome in a certain way? For example, is there a (version of a) voting rule which would have made country X the winner of the ESC?

Secondary question: Can we conjecture from the voting data that certain countries are colluding with/biased towards each other? There are many different approaches possible, and one could look at the papers cited in the literature review for inspiration.

(more questions perhaps to come)

3 Method and approach

The programming language used for this research will be Python. First of all, the needed data will be extracted from the data set provided (source here). Then, I will create a data structure which will handle voting rules and a set of rankings. With these two parts, it should be possible to reproduce the result for any given set of rankings, given the voting rule.

With this all in place, experimenting with different voting rules can begin. The first task to do is programming older voting rules, and applying these rules on newer/older iterations of the ESC rankings to see how the result changes. The voting rule has changed drastically over the years, so most of the rules will only be applicable to part of the dataset. The second task would be designing and then programming an algorithm which can find a (version of) a voting rule which alters the outcome in a certain way. For example: Is there a voting rule such that the second place finisher in ESC 2018 would have placed first? There would be restraints on the types of rules that can be used. The key restriction a priori is: when a country gets ranked x^{th}, the amount of points this country receives is higher than the country that gets ranked $x + 1^{th}$ for all x from 1 to N-1 where N is the amount of countries participating. With the functionalities programmed to complete this task, other questions will likely arise, which can be answered if there is still time left.

After completing this part, the secondary question will be answered. To do this, a way of measuring bias from two countries towards each other will have to be thought of and programmed. This will then be run on (parts of) the data set, and have to be compared to some sort of baseline. This can perhaps be done with a statistical test.

4   Evaluation

To evaluate the primary research question, the proximity of two rankings using different voting rules can be analyzed. This can be taken to the extreme, by f.e. answering the question "What is the most different result achievable by changing the voting rule (with x constraints)?" and then computing the distance between this result and the original result.

To evaluate the secondary question, an attempt must be made to conclude if the outliers differ enough from the baseline. Afterwards, we can verify if these biases match up with earlier found biases and public opinion.

5   Plan

Week 1: Import dataset and restructure, make classes for rules and rankings, program different voting rules and make them applicable on the part of the dataset which they are compatible with.

Week 2: Design and then implement algorithm which can find the (version of the) voting rule that changes the results in a way that country x ends up in y^{th} place (instead of zth place). Extend this as far as interesting, i.e. which rule changes results the most? What countries can finish first by changing the rule?

Week 3: Start writing the main part of the thesis, answering the primary question.

Week 4: Design the functions and algorithms to answer the second question.

Week 5: Implement the functions and algorithms to answer the second question.

Week 6: Write about second question. Prepare midterm presentation.

Week 7, 8: Answer extra questions and write about them. Prepare final presentation. Wrap up of the actual thesis.

References

[1] D. Gatherer. "Comparison of Eurovision Song Contest simulation with actual results reveals shifting patterns of collusive voting alliances." In: *Journal of Artificial Societies and Social Simulation* 9.2 (Mar. 2006). URL: http://eprints.gla.ac.uk/4801/.

[2] Alexander V. Mantzaris, Samuel R. Rein, and Alexander D. Hopkins. "Examining Collusion and Voting Biases Between Countries During the Eurovision Song Contest Since 1957". In: *Journal of Artificial Societies and Social Simulation* 21.1 (2018), p. 1. ISSN: 1460-7425. DOI: 10.18564/jasss.3580. URL: http://jasss.soc.surrey.ac.uk/21/1/1.html.

[3] Laura Spierdijk and Michel Vellekoop. "The structure of bias in peer voting systems: lessons from the Eurovision Song Contest". In: *Empirical Economics* 36.2 (May 2009), pp. 403–425. ISSN: 1435-8921. DOI: 10.1007/s00181-008-0202-5. URL: https://doi.org/10.1007/s00181-008-0202-5.