Student Papers in Public Policy

Volume 2 | Issue 1 Article 1

2020

The Case for Online Ranked-Choice Voting

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Summary

- Maine recently implemented ranked-choice voting state-wide
- Studies show where ranked-choice voting may go wrong: a phenomenon known as "ballot exhaustion" in which voters don't completely fill out the ballot
- Online voting may mitigate ballot exhaustion, but creates its own set of potential security risks
- Emerging encryption systems can protect against such risks, making online voting a good option for Maine to combat ballot exhaustion

Introduction

Maine was the first to embrace ranked-choice voting on a statewide level in 2018, using it for all state and general elections. Maine voters will be the first to use ranked-choice voting in a presidential election in 2020. This system differs from traditional voting in that voters rank candidates rather than choose just one. Supporters of ranked-choice voting tout it as a better model for accurately representing the values of the voting population; however, a study conducted in San Francisco details a potential shortfall referred to as "ballot fatigue" that the theoretically-ideal system may face as it struggles to deal with human error. Online voting has the potential to mitigate these problems, but also opens the door to cybersecurity risks. The best solution is an online-voting encryption system already proposed in other countries – it would allow for all the benefits of ranked-choice voting, while minimizing its potential for human error and cybersecurity risks.

Ranked-Choice Voting

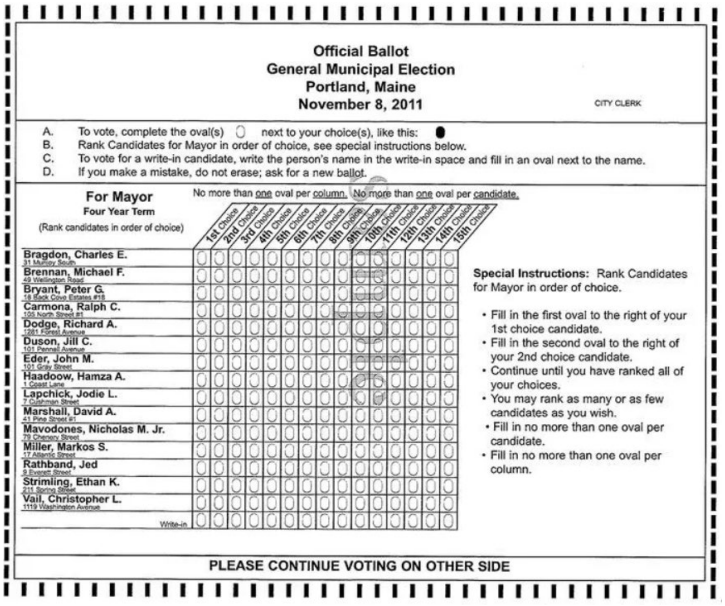
After years of advocacy for ranked-choice voting, Maine citizens decided that the benefits were worth the leap into a largely untested method of voting. Also known as instant-runoff voting, ranked-choice voting asks voters to rank some number of candidates

rather than choose just one. Traditionally, in an election with more than two candidates, the one with the plurality of votes wins. With ranked-choice voting however, if no candidate has a majority, whichever candidate has the fewest votes is eliminated. Voters who had placed that candidate first then have their votes reallocated to whichever candidate they have ranked after the candidate that was just dropped. Then votes are recounted to determine if a candidate holds a majority, and if one doesn't, the process repeats.

With all the counting, reallocating, and recounting, ranked-choice voting is a calculation-intensive system that is only possible to implement in areas with the resources to upload every voter's ballot to software that will run the ranked-choice voting algorithm. Current implementation in Maine involves voters coming out to polling stations, filling out a scannable paper ballot, and then uploading it through a scanner one-by-one. Although most voters understand ranked-choice voting well once it is explained to them, the ballot itself appears complex and can result in what one San Francisco-based study terms "ballot exhaustion."

Ballot Exhaustion

Ballot exhaustion occurs because ranking numerous candidates is more demanding on voters than choosing a single favorite. Researchers in San Francisco found that when asked to rank their top three choices, a substantial number of voters would rank only one or two candidates rather than all three. As a result, their votes were essentially discarded in the second or third rounds of runoff and in some situations, the winning candidate did not actually receive a majority of votes from the total number of voters.



Official Ballot
General Municipal Election
Portland, Maine
November 8, 2011

CITY CLERK

A. To vote, complete the oval(s) ○ next to your choice(s), like this: ●
B. Rank Candidates for Mayor in order of choice, see special instructions below.
C. To vote for a write-in candidate, write the person's name in the write-in space and fill in an oval next to the name.
D. If you make a mistake, do not erase; ask for a new ballot.

For Mayor
Four Year Term
(Rank candidates in order of choice)

No more than one oval per column. No more than one oval per candidate.

1st Choice, 2nd Choice, 3rd Choice, 4th Choice, 5th Choice, 6th Choice, 7th Choice, 8th Choice, 9th Choice, 10th Choice, 11th Choice, 12th Choice, 13th Choice, 14th Choice, 15th Choice

Bragdon, Charles E. 31 Mallory Street
Brennan, Michael F. 49 Wellington Road
Bryant, Peter G. 14 Rock Cove Entrance #15
Carmona, Ralph C. 100 North Street #1
Dodge, Richard A. 1281 Forest Avenue
Duson, Jill C. 101 Pennell Avenue
Eder, John M. 101 Gray Street
Haadoow, Hamza A. 1 Quest Lane
Lapchick, Jodie L. 7 Dunham Street
Marshall, David A. 41 Pine Street #1
Mavodones, Nicholas M. Jr. 79 Chenery Street
Miller, Markos S. 17 Alfarata Street
Rathband, Jed 9 Everett Street
Strimling, Ethan K. 211 Spring Street
Vail, Christopher L. 1119 Washington Avenue
Write-in

Special Instructions: Rank Candidates for Mayor in order of choice.

- Fill in the first oval to the right of your 1st choice candidate.
- Fill in the second oval to the right of your 2nd choice candidate.
- Continue until you have ranked all of your choices.
- You may rank as many or as few candidates as you wish.
- Fill in no more than one oval per candidate.
- Fill in no more than one oval per column.

PLEASE CONTINUE VOTING ON OTHER SIDE

Pictured above: A ranked-choice voting ballot provided to voters during a 2011 municipal election for mayor illustrates the complexity.

Source: vox.com/2018/6/12/17448450/maine-Ranked-choice-voting-paul-lepage-instant-runoff-2018-midterms

This real-world flaw of ranked-choice voting runs contrary to what makes it so beneficial in theory. Advocates of the system assert that it yields the candidate favored by the greatest number of voters. Ranked-choice voting also improves voter engagement and decreases animosity in campaigns by changing candidates' focus from tearing down their opponents to promoting themselves. Another bonus is that it increases minority representation in government. The idea that ranked-choice voting is more likely to choose the "best" candidate is dependent on it selecting a candidate who actually receives the majority of votes after some number of runoff rounds, which in San Francisco, it didn't. The potential for ranked-choice voting to increase minority representation is tied to its claim to choose more representative candidates. And as for voter engagement, the phenomenon of ballot

exhaustion is an example of active *dis*engagement.

Encrypted Online Voting

Online voting may be an effective remedy for ballot exhaustion. Rather than asking voters to come out to the polls and rank five or ten different unfamiliar candidates, it would allow them to vote from the comfort of their own homes and allow time to research candidates while ranking them. Furthermore, online voting may allow for a less-crowded interface for voters to work with, making the number of options seem less intimidating.

Online voting raises its own set of challenges though, mainly those of potential hacking attacks and voter privacy. A group of Australian researchers developed an online voting system that tackles both, using what is called an ElGamal cryptosystem. This is a computerized system specifically meant to run the ranked-choice voting process securely by using advanced encryption techniques. The researchers identified six key requirements an e-voting system needs to meet: verifying voter eligibility, multiple-voting detection, voter choice privacy, ballot integrity (can't be modified after submission), accurate tallying, and end-to-end vote verifiability (allows voters to check if their vote was counted correctly). In addition to meeting these requirements, their encryption algorithm can be described as "homomorphic," which means that votes can be tallied without having to be decrypted one-by-one. For a system like ranked-choice voting, which may involve many rounds of tallying, homomorphic encryption decreases the computing power it takes to tally millions of votes in multiple rounds, which in turn decreases the money and time necessary to determine the victor.

Suggestions for the Maine Legislature

Maine is a bold leader in ranked-choice voting. Ranked-choice voting has considerable potential for positive changes in current voting: decreasing animosity in campaigns, increasing voter engagement, "fairer" results, and more minority representation in government. Although encouraging in theory, ranked-choice voting has not been significantly tested in practice, and never on the state-wide level before, and so Maine has opened the door for unpredicted challenges. To deal with ballot exhaustion, Maine should turn to online voting, which would take pressure off voters and give them time to decide how to rank numerous candidates while working with a cleaner interface. Furthermore, to implement online voting in a safe and secure manner, Maine should use the ElGamal encryption system proposed by Australian researchers. As with any major shift to a new technology, they should be aware of potential technical difficulties and run practice implementations before using it in a genuine election. As other local governments and state legislatures look to Maine to see how the implementation of ranked-choice voting plays out, Maine should ensure that it gives ranked-choice voting its best chance to live up to its potential.