MITIGATING POTENTIAL VOTE-BY-MAIL FRAUD WHILE
SIMULTANEOUSLY INCREASING VOTE-BY-MAIL BALLOT
ACCEPTANCE BY UTILIZING FACIAL RECOGNITION AND
MULTIFACTOR AUTHENTICATION TECHNOLOGY

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I. INTRODUCTION

Mail-in/absentee voting has become a salient issue in the upcoming 2020 presidential election due to the Covid-19 pandemic.[1] That is, many registered voters may not feel safe to vote in-person on election day or during an early voting period because they fear for their health by being potentially exposed to Covid-19 while casting their ballot in person at a voting poll location.[2] Instead, many of these registered

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1. *See* Richard H. Pildes, *How to Accommodate a Massive Surge in Absentee Voting*, 2020 U. CHI. L. REV. 45, 1 (2020) ("Perhaps effective treatments for coronavirus will even emerge by [the fall], which will make some people more willing to vote in person. But even so, election officials must anticipate and prepare now for unprecedented levels of absentee voting."); *see* Dylan Matthews, *Trump Insists Absentee Ballots Are Fair, But Mail Voting is Corrupt. That's Nonsense*, VOX (Aug. 18, 2020, 12:30 PM), http://www.vox.com/policy-and-politics/2020/8/18/21373478/absentee-ballot-vote-by-mail-voting ("This year, California is going a step further due to Covid-19 and mailing ballots to every eligible voter. … A few states [New Jersey, Vermont, and Nevada] that are not traditionally vote-by-mail states are sending out ballots to all registered and/or eligible voters this year due to the unique circumstances of the pandemic.")

2. *See* Pildes, *supra* note 1; *see* Matthews, *supra* note 1.

voters may prefer to cast their ballot using mail-in/absentee voting.[3] However, there have been concerns expressed by the President and Republicans of potential voter fraud in mail-in voting, but the same level of concern has not been expressed regarding absentee voting.[4] In contrast, some election experts have concerns that many mail-in/absentee ballots are rejected due to noncompliance of ballot requirements or the voter signature on the ballot does not match the signature on file with the state due to voter error or election official mistake (i.e., voter signature mismatch).[5] This Article proposes technological solutions to mitigate both concerns.

Vote-by-mail can be an umbrella term that covers both mail-in voting and absentee voting. Mail-in voting can be distinguished from absentee voting as follows: 1) mail-in voting is a process implemented by a state that mails a ballot to each registered voter to their last known address *without the registered voter requesting* the mail-in ballot; and 2) absentee voting is a process implemented by a state that mails a ballot to a registered voter *only after the registered voter requests* the absentee ballot.[6] However, some experts[7] argue that mail-in voting includes an inherent flaw in that unrequested ballots sent to addresses of registered voters can be stolen by those who may want to influence the election. Several alleged voter fraud scenarios are perpetuated that include perpetrators anticipating the delivery of the mail-on ballots and stealing the mail-in ballots en route to the registered voters. This scenario may not be far-fetched, some claim, as the perpetrators would

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3. *See* Pildes, *supra* note 1; *see* Matthews, *supra* note 1.

4. Quint Forgey & Matthew Choi, *Trump Pledges Lawsuit to Block Mail-In Voting In Nevada*, POLITICO (Aug. 3, 2020, 8:43 AM), https://www.politico.com/news/2020/08/03/trump-nevada-mail-voting-lawsuit-390878 (Despite the president's insistence to the contrary, cases of election fraud in the U.S. are exceedingly rare. Experts acknowledge there are some slightly higher fraud risks associated with mail-in balloting, but only when proper security measures are not put in place."); *see* Matthews., *supra* note 1 ("President Donald Trump has repeatedly attacked voting by mail as prone to fraud (it's not), he has also taken pains to distinguish between "voting by mail" and "absentee voting.")

5. Elise Viebeck & Michelle Ye Hee Lee, *Tens of Thousands of Mail Ballots Have Been Tossed Out in This Year's Primaries. What Will Happen in November?*, WASHINGTON POST (July 18, 2020, 9:26 AM), https://www.washingtonpost.com/politics/tens-of-thousands-of-mail-ballots-have-been-tossed-out-in-this-years-primaries-what-will-happen-in-november/2020/07/16/fa5d7e96-c527-11ea-b037-f9711f89ee46_story.html ("In Nevada, about 6,700 ballots were rejected in June because election officials could not verify voters' signatures … The rejection of ballots because of mail delays, signature match problems and errors in completing and sealing the forms could end up disenfranchising hundreds of thousands of people."). Jane C. Timm, *States Reject Tens of Thousands of Mail Ballots in This Year's Primaries, Setting Off Alarm Bells for November*, NBC NEWS (July 18, 2020, 3:30 AM), hhttps://www.nbcnews.com/politics/2020-election/states-reject-tens-thousands-mail-ballots-year-a-primaries-setting-n1233833 ([I]n Jefferson County [Kentucky], more than 8,000 ballots, or approximately 4.4 percent of the county's ballots were tossed – more than half because the voter had forgotten to sing the ballot or its envelope.")

6. *See* Pildes, *supra* note 1; *see* Matthews, *supra* note 1.

7. *See* Forgey & Choi, *supra* note 4.

know *a priori* when the state would deliver mail-in ballots. The purported scenario continues by alleging that once the mail-in ballots are stolen by the perpetrators, they then commit voter fraud using the stolen mail-in ballots.[8] Alternatively, another alleged voter fraud scenario can include a registered voter having moved her residence since last registering to vote and the current occupant residing at the last known address of the registered voter may receive the mail-in ballot of the previous occupant of the residence. The current occupant may cast the received mail-in ballot instead of the previous occupant, thereby committing voter fraud.[9]

In contrast, absentee voting purportedly reduces the likelihood of these alleged voter fraud scenarios by having the registered voter requesting the absentee ballot from state election officials. Further, as the requests for absentee ballots are received at different times, they may also be sent at different times such that a perpetrator cannot anticipate their delivery, and thereby would not be able to steal absentee ballots en route to the registered voter. In addition, as the register voter requests the absentee ballot and indicates her current address, therefore the alleged voter fraud scenario of an absentee ballot being mailed to an address other than the current address of the requesting registered voter would be unlikely.[10]

Moreover, examining the procedures behind mail-in voting and absentee voting reveals a trade-off between different policies. Proponents of election turnout prefer mail-in voting as more registered voters would receive mail-in ballots without even requesting ballots.[11] In contrast, proponents of voter integrity prefer absentee voting because absentee ballots are highly likely to be mailed to each registered voter's correct current address and reduce the likelihood of ballot theft without regard to election turnout.[12]

II. WHY DOES MAIL-IN/ABSENTEE VOTING MATTER?

The entire world is in the midst of the global Covid-19 pandemic.[13] In the United States, the Centers for Disease Control and Prevention has issued guidelines that include wearing masks or maintaining at least six feet of social distancing in public.[14] These guidelines may deter an

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8. Forgey and Choi, *supra* note 4; Matthews, *supra* note 1.
9. Forgey and Choi, *supra* note 4; Matthews, *supra* note 1.
10. Forgey and Choi, *supra* note 4; Matthews, *supra* note 1.
11. Swanson, *infra* note 35.
12. Forgey and Choi, *supra* note 4; Matthews, *supra* note 1.
13. Pildes, *supra* note 1; Matthews, *supra* note 1.
14. *Considerations for Wearing Masks*, CTRS. DISEASE CONTROL & PREV (Aug. 7, 2020), https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover-guidance.html; *Social Distancing*, CTRS. DISEASE CONTROL & PREV (July 15, 2020),

electorally significant number of registered voters from casting their ballot in person on Election Day, November 3, 2020.[15] Further, earlier this year when the pandemic first infiltrated the country, many states issued shelter-in-place or business lockdown orders to reduce the spread of Covid-19.[16] As the spread of Covid-19 increases during the Fall of 2020, states may issue or recommend (at least partial) business lockdown orders again, further deterring registered voters from casting their ballots in person.[17] Thus, mail-in/absentee voting has been critical to prevent the pandemic from disenfranchising U.S. citizens in the upcoming 2020 presidential election.[18]

In view of the health concerns due to Covid-19, recent polls indicate that 58%-70% of people in the U.S. support mail-in/absentee voting.[19] Although many of those that support mail-in/absentee voting may actually vote in-person, the recent polls indicate that a significant proportion of the electorate plan to cast their ballot via mail-in/absentee voting.[20] Further, analyzing the recent polls along political affiliation, there is a dramatic difference along party lines. An exemplary poll shows that 83% of Democrats support mail-in/absentee voting while only 44% of Republicans do so.[21] Other polls indicate that Democrats

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https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/social-distancing.html#:~:text=Social%20distancing%2C%20also%20called%20%E2%80%9Cphysical,both%20indoor%20and%20outdoor%20spaces.

15. Pildes, *supra* note 1; Matthews, *supra* note 1.

16. *Considerations for Wearing Masks*, CTRS. DISEASE CONTROL & PREV. (Aug. 7, 2020), https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover-guidance.html. *Social Distancing*, CTRS. DISEASE CONTROL & PREV (July 15, 2020), https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/social-distancing.html#:~:text=Social%20distancing%2C%20also%20called%20%E2%80%9Cphysical,both%20indoor%20and%20outdoor%20spaces. Dan Petrella, Stacy St. Clair, Steve Johnson, and Gregory Pratt, *Gov. J. B. Pritzker Issues Order Requiring Residents to 'Stay at Home' Starting Saturday*, Chicago Tribune (Mar 20, 2020), https://www.chicagotribune.com/coronavirus/ct-coronavirus-illinois-shelter-in-place-lockdown-order-20200320-teedakbfw5gvdgmnaxlel54hau-story.html

17. Pildes, *supra* note 1.

18. *Id.*

19. Nathaniel Rakich, *Americans Mostly Support Voting By Mail*, Fivethirtyeight (Jul. 24, 2020, 5:58 AM), https://fivethirtyeight.com/features/americans-support-voting-by-mail-but-not-all-f-them-want-to-or-can/. Juana Summers, *Poll: More Than Half of Young People Lack of Resources to Vote By Mail*, NPR (Jul 30, 2020 5:00 AM), https://www.npr.org/2020/0730/896993401/poll=more-than-half-of-young-people-lack-resources-to-vote-by-mail/. Quint Forgey, *Poll: Majority Support Voting By Mai, Bucking Trump*, POLITICO (Aug 5, 2020 6:00 AM) https://www.politico.com/news/2020/0805/voting-by-mail-elections-poll-391318. Jonathan Easley, *Poll: 70 Percent of Americans Support Voting By Mail*, THE HILL (Jul 30, 2020 11:25 AM), https://thehill.com/homenews/campaign/50977-poll-70-percent-of-americans-support-voting-by-mail

20. Rakich, *supra* note 19; Summer, *supra* note 19; Forgey, *supra* note 19; Easley, *supra* note 19.

21. Rakich, *supra* note 19; Summer, *supra* note 19; Forgey, *supra* note 19; Easley, *supra* note 19.

and Independents favor casting their ballot through mail-in/absentee voting compared to Republicans.[22] One poll states that 88% of Democrats and 71% of Independents favor casting their ballots through mail-in/absentee voting compared to only 50% of Republicans.[23]

Historical data reveals that the chasm between the preferences of members of the two political parties in casting their ballots by mail can lead to electorally significant outcomes in this election due to rejection rates of mail-in/absentee ballots. That is, at least 2% of mail-in/absentee ballots are not counted to due to noncompliance of ballot requirements (*e.g.*, voter signature mismatch, absence of witness signature, absence of envelope signature, naked ballot, *etc.*).[24] Already, reports regarding vote-by-mail in the current election indicate a 3.4% rejection rate of absentee ballots in some states.[25] Further, reports indicate more people will vote via mail-in/absentee voting in the 2020 presidential election compared to past elections, with many of these people being first-time mail-in/absentee voters, such that some experts fear that the rejected mail-in/absentee ballots can reach up to 10% of the total votes cast.[26]

Unfairly, the rejection rates of mail-in/absentee ballots combined with the polling information regarding the likelihood of Democrats and Independents to use mail-in/absentee voting creates a Republican advantage of 1-2% in the election overall in each battleground state.[27] With three battleground states (Pennsylvania, Michigan, and Wisconsin) in the 2016 presidential election decided by less than this margin, it is imperative that the state's vote-by-mail procedures and policies ensure that registered voters' mail-in/absentee ballots are not rejected.[28] However, the current rudimentary mail-in/absentee voting system may not be sufficient to ensure that almost all (*e.g.*, more than

22. Rakich, *supra* note 19; Summer, *supra* note 19; Forgey, *supra* note 19; Easley, *supra* note 19.

23. Rakich, *supra* note 19; Summer, *supra* note 19; Forgey, *supra* note 19; Easley, *supra* note 19.

24. Viebeck and Lee, *supra* note 5; Timm, *supra* note 5.

25. Alex Corse and Chad Day, *Corona virus Surge in Mail Voting Likely to Lead to More Rejected Ballots,* WALL ST. J. (Oct. 4, 2020 12:00 PM), https://www.wsj.com/articles/coronavirus-surge-in-mail-voting-likely-to-lead-to-more-rejected-ballots-11601827201

26. Viebeck and Lee, *supra* note 5. Timm, *supra* note 5.

27. Caitlin Huey-Burns and Adam Brewster, *Why Some Mail-In Ballots Are Rejected and How to Make Sure You Vote Counts*, CBS NEWs (Aug. 4, 2020 7:03 AM), https://www.cbsnews/com/news/why-mail-in-ballot-rejected-voting-counts/. Viebeck and Lee, *supra* note 5. Timm, *supra* note 5. *Arizona President: General Election Polls*, FIVETHIRTYEIGHT (Aug. 22, 2020 11:55AM) https://projects.fivethityeight.com/polls/president-general/arizona/

28. *Presidential Election Results: Donald J. Trump Wins*, N.Y. TIMES (Aug. 9, 2017 9:00 AM), https://www.nytimes.com/elections/2016/results/president

99%) of mail-in/absentee ballots are accepted so that ballot rejection does not significant affect the election outcome.[29]

Moreover, current polls strongly indicate that there are many battleground states in upcoming 2020 presidential election.[30] Mail-in/absentee voting can determine the election results in each of these battleground states, thereby deciding the outcome of the presidential election overall.[31] This Article considers mail-in/absentee voting procedures in eight battleground states, Arizona, Colorado, Florida, Michigan, Nevada, North Carolina, Pennsylvania, and Wisconsin and the way in which ballot rejection could determine the winner of the presidential election.

III. VOTE-BY-MAIL PROCEDURES IN BATTLEGROUND STATES

Each state develops mail-in/absentee voting procedures that provide both integrity of receipt of mail-in/absentee ballots and integrity of verifying mail-in/absentee ballots.[32] Both of these aspects should work in concert to simultaneously mitigate voter fraud and increase mail-in/absentee ballot acceptance.

A. Receipt Integrity of Vote-by-Mail Ballot

Mail-in ballots are delivered by a state to all registered voters without any registered voter submitting a request for a mail-in ballot. The state sends a targeted mail-in ballot to the address of a registered voter on file with the state.[33] Thus, in this context, integrity of the receipt of mail-in ballots means ensuring that each registered voter receives their individual, targeted mail-in ballot, that each targeted mail-in ballot is sent to the correct address for each registered voter, and that no targeted mail-in ballot is sent to anyone other than the targeted registered voter.[34]

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29. Huey-Burns and Brewster, *supra* note 27. Viebeck and Lee, *supra* note 5. Timm, *supra* note 5.

30. *Electoral College Interactive Maps: The Road to 270*, CNN (Aug. 19, 2020), https://www.cnn.com/election/2020/electoral-college-interactive-maps.

31. Editorial Board, *Voting by Mail is Crucial for Democracy*, N.Y. TIMES (Aug. 1, 2020), https://www.nytimes.com/2020/008/01/opinion/sunday/mail-voting-covid-2020-election.html

32. Huey-Burns and Brewster, *supra* note 27; Viebeck and Lee, *supra* note 5; Timm, *supra* note 5.

33. *Mail-in   Ballots   FAQs*, https://www.sos.state.co.us/pubs/elections/FAQs/mailBallotsFAQ.html.

34. *Id*.; *see* Huey-Burns and Brewster, *supra* note 27; *see* Viebeck and Lee, *supra* note 5; *see* Timm, *supra* note 5; *see* Pildes, *supra* note 1.

Of the eight battleground states discussed herein, only Colorado and Nevada have mail-in ballot procedures (rather than absentee ballot procedures).[35] Colorado and Nevada both consistently and frequently update voting rolls of current registered voters, as well as the current registered voters' corresponding current addresses.[36] This includes culling voting rolls of people who have passed away or moved out-of-state, and modifying voting rolls for those people who have moved within the state.[37] Once there are accurate voting rolls, Colorado and Nevada can deliver targeted mail-in ballots to targeted registered voters, so that all registered voters receive their own, individual, targeted mail-in ballot. At the same time, maintenance of accurate voting rolls limits unregistered voters — or non-targeted registered voters — from receiving mail-in ballots.[38] Otherwise, two scenarios may result in voter fraud.

First, an unregistered voter can receive a mail-in ballot targeted to a registered voter and the unregistered voter can cast the mail-in ballot fraudulently. Second, a non-targeted registered voter receives a mail-in ballot targeted to another registered voter, in addition to receiving a mail-in ballot targeted to herself. The non-targeted registered voter casts two mail-in ballots: one targeted to herself and a second ballot targeted to another registered voter. Both scenarios result in committing voter fraud.

Six of the eight battleground states considered herein — Arizona, Florida, Michigan, North Carolina, Pennsylvania, and Wisconsin — implemented absentee voting procedures in which registered voters request an absentee ballot.[39] All six of these battleground states allow for no excuse absentee voting.[40] That is, no registered voter needs a

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35. Conrad Swanson, *Colorado's Vote-By-Mail Ballots Begin Life in Washington State and End in Storage. Here's What Happens in Between*, DENVER POST (Aug. 16, 2020 1:36 PM), https://www.denverpost.com/2020/08/16/colorado-denver-mail-voting-usps-2020-election/. Ellie Kaufman and Marshall Cohen, *Nevada Approves Plan to Mail Ballots to All Registered Voters*, CNN (Aug. 5, 2020 12:20 PM), https://www.cnn.com/2020/0803/politics/nevada-mail-nallots-registered-voters/index.html.

36. Swanson, *supra* note 35; Kaufman and Cohen, *supra* note 54.

37. Swanson, *supra* note 35; Kaufman and Cohen, *supra* note 35.

38. Swanson, *supra* note 35; Kaufman and Cohen, *supra* note 35.

39. *See Voting by Mail: How to Get a Ballot-by-Mail*, Katie Hobbs Secretary of State, https://azsos.gov/votebymail; *see Vote-by-Mail*, FLORIDA DIV. OF ELECTIONS, https://dos.myflorida.com/elections/for-voters/voting/vote-by-mail/; *see Absentee Voting Allows You to Vote by Mail*, The Office of Secretary of State Jocelyn Benson, https://www.michigan.gov/sos/0,4670,7-127-1633_8716_8728-21037--,00.html; *see Vote by Mail*, NCSBE, https://www.ncsbe.gov/voting/vote-mail; *see Voting in Pennsylvania*, COMMONWEALTH OF PENNSYLVANIA, https://www.pa.gov/guides/voting-and-elections/; *see I Want to Vote Absentee*, WISCONSIN ELECTIONS COMMISSION, https://elections.wi.gov/voters/absentee.

40. *See Voting by Mail: How to Get a Ballot-by-Mail*, *supra* note 39; *see Vote-by-Mail*, *supra* note 39; *see Absentee Voting Allows You to Vote by Mail*, *supra* note 39; *see Vote by Mail*, *supra* note 39; *see Voting in Pennsylvania*, *supra* note 39; *see I Want to Vote Absentee*,

medical excuse (*e.g.*, a non-ambulatory medical condition) or to show a legitimate absence on election day (*e.g.*, out-of-state college residents, serving overseas in the military, *etc*.).[41] In accordance with absentee voting procedures, the registered voter must submit a request for the absentee ballot to the state.[42] The request can be submitted via the Internet, email, or mail.[43] In response, the state delivers the absentee ballot using the postal service to the registered voter at the address indicated in the request.[44]

Thus, the integrity of receipt of absentee ballot may be higher than that of a mail-in ballot due to the registered voter providing a correct address to the state to send the absentee ballot rather than the state maintaining an up-to-date file of correct addresses for each registered

supra note 39.   *See Voting by Mail: How to Get a Ballot-by-Mail*, Katie Hobbs Secretary of State, https://azsos.gov/votebymail; *see Vote-by-Mail*, FLORIDA DIV. OF ELECTIONS, https://dos.myflorida.com/elections/for-voters/voting/vote-by-mail/; *see Absentee voting allows you to vote by mail*, The Office of Secretary of State Jocelyn Benson, https://www.michigan.gov/sos/0,4670,7-127-1633_8716_8728-21037--,00.html; *see Vote by Mail*, NCSBE, https://www.ncsbe.gov/voting/vote-mail; *see Voting in Pennsylvania*, COMMONWEALTH OF PENNSYLVANIA, https://www.pa.gov/guides/voting-and-elections/; *see I want to vote absentee*, WISCONSIN ELECTIONS COMMISSION, https://elections.wi.gov/voters/absentee.

41. *See Voting by Mail: How to Get a Ballot-by-Mail*, *supra* note 39; *see Vote-by-Mail*, *supra* note 39; *see Absentee Voting Allows You to Vote by Mail*, *supra* note 39; *see Vote by Mail, supra* note 39; *see Voting in Pennsylvania*, *supra* note 39; *see I Want to Vote Absentee*, *supra* note 39.

42. *See Voting by Mail: How to Get a Ballot-by-Mail*, *supra* note 39; *see Vote-by-Mail*, *supra* note 39; *see Absentee Voting Allows You to Vote by Mail*, *supra* note 39; *see Vote by Mail, supra* note 39; *see Voting in Pennsylvania*, *supra* note 39; *see I Want to Vote Absentee*, *supra* note 39.   *See Voting by Mail: How to Get a Ballot-by-Mail*, Katie Hobbs Secretary of State, https://azsos.gov/votebymail; *see Vote-by-Mail*, FLORIDA DIV. OF ELECTIONS, https://dos.myflorida.com/elections/for-voters/voting/vote-by-mail/; *see Absentee voting allows you to vote by mail*, The Office of Secretary of State Jocelyn Benson, https://www.michigan.gov/sos/0,4670,7-127-1633_8716_8728-21037--,00.html; *see Vote by Mail*, NCSBE, https://www.ncsbe.gov/voting/vote-mail; *see Voting in Pennsylvania*, COMMONWEALTH OF PENNSYLVANIA, https://www.pa.gov/guides/voting-and-elections/; *see I want to vote absentee*, WISCONSIN ELECTIONS COMMISSION, https://elections.wi.gov/voters/absentee.

43. *See Voting by Mail: How to Get a Ballot-by-Mail*, *supra* note 39; *see Vote-by-Mail*, *supra* note 39; *see Absentee Voting Allows You to Vote by Mail*, *supra* note 39; *see Vote by Mail, supra* note 39; *see Voting in Pennsylvania*, *supra* note 39; *see I Want to Vote Absentee*, *supra* note 39.   *See Voting by Mail: How to Get a Ballot-by-Mail*, Katie Hobbs Secretary of State, https://azsos.gov/votebymail; *see Vote-by-Mail*, FLORIDA DIV. OF ELECTIONS, https://dos.myflorida.com/elections/for-voters/voting/vote-by-mail/; *see Absentee voting allows you to vote by mail*, The Office of Secretary of State Jocelyn Benson, https://www.michigan.gov/sos/0,4670,7-127-1633_8716_8728-21037--,00.html; *see Vote by Mail*, NCSBE, https://www.ncsbe.gov/voting/vote-mail; *see Voting in Pennsylvania*, COMMONWEALTH OF PENNSYLVANIA, https://www.pa.gov/guides/voting-and-elections/; *see I want to vote absentee*, WISCONSIN ELECTIONS COMMISSION, https://elections.wi.gov/voters/absentee.

44. *See Voting by Mail: How to Get a Ballot-by-Mail*, *supra* note 39; *see Vote-by-Mail*, *supra* note 39; *see Absentee Voting Allows You to Vote by Mail*, *supra* note 39; *see Vote by Mail, supra* note 39; *see Voting in Pennsylvania*, *supra* note 39; *see I Want to Vote Absentee*, *supra* note 39.

voter to send a mail-in ballot. However, it should be noted that there is an additional policy goal and resulting benefit from mail-in voting compared to absentee voting. That is, there is a substantial increase in voter turnout utilizing mail-in voting compared to absentee voting due to the fact that almost every registered voter on the voting rolls is sent a mail-in ballot while only registered voters that request an absentee ballot are sent one.[45]

B. Integrity of Verifying of a Vote-by-Mail Ballot

Each of the eight battleground states have different requirements on completing a mail-in/absentee ballot to mitigate voter fraud.[46] These can include signing the mail-in/absentee ballot, signing of the envelope, requiring a witness to sign the mail-in/absentee ballot, and enclosing the mail-in/absentee ballot in a secrecy envelope (no naked ballot). [47] All eight battleground states provide verification of the mail-in/absentee ballot based on a signature.[48] That is, the signature on the mail-in/absentee ballot is compared to the signature on file within voter registration records.[49] Some of the battleground states require signature of the envelope, as well as a witness to sign the ballot or envelope.[50] If the registered voter's signatures do not match, the mail-in/absentee ballot is rejected,[51] or if the registered voter does not comply with any of these requirements, then the ballot is not counted.[52] However, many

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45. Pildes, *supra* note 1.

46. *See Voting by Mail: How to Get a Ballot-by-Mail*, *supra* note 39; *see Vote-by-Mail*, *supra* note 39; *see Absentee Voting Allows You to Vote by Mail*, *supra* note 39; *see Vote by Mail*, *supra* note 39; *see Voting in Pennsylvania*, *supra* note 39; *see I Want to Vote Absentee*, *supra* note 39.

47. *See Voting by Mail: How to Get a Ballot-by-Mail*, *supra* note 39; *see Vote-by-Mail*, *supra* note 39; *see Absentee Voting Allows You to Vote by Mail*, *supra* note 39; *see Vote by Mail*, *supra* note 39; *see Voting in Pennsylvania*, *supra* note 39; *see I Want to Vote Absentee*, *supra* note 39.

48. *See Voting by Mail: How to Get a Ballot-by-Mail*, *supra* note 39; *see Vote-by-Mail*, *supra* note 39; *see Absentee Voting Allows You to Vote by Mail*, *supra* note 39; *see Vote by Mail*, *supra* note 39; *see Voting in Pennsylvania*, *supra* note 39; *see I Want to Vote Absentee*, *supra* note 39.

49. *See Voting by Mail: How to Get a Ballot-by-Mail*, *supra* note 39; *see Vote-by-Mail*, *supra* note 39; *see Absentee Voting Allows You to Vote by Mail*, *supra* note 39; *see Vote by Mail*, *supra* note 39; *see Voting in Pennsylvania*, *supra* note 39; *see I Want to Vote Absentee*, *supra* note 39.

50. *See Vote by Mail, supra* note 39

51. *See Voting by Mail: How to Get a Ballot-by-Mail*, *supra* note 39; *see Vote-by-Mail*, *supra* note 39; *see Absentee Voting Allows You to Vote by Mail*, *supra* note 39; *see Vote by Mail*, *supra* note 39; *see Voting in Pennsylvania*, *supra* note 38; *see I Want to Vote Absentee*, *supra* note 39.

52. Huey-Burns and Brewster, *supra* note 27; Viebeck and Lee, *supra* note 5; Timm, *supra* note 5; *see Voting by Mail: How to Get a Ballot-by-Mail*, *supra* note 39; *see Vote-by-Mail*, *supra* note 39; *see Absentee Voting Allows You to Vote by Mail*, *supra* note 38; *see Vote by Mail, supra* note 38; *see Voting in Pennsylvania*, *supra* note 38; *see I Want to Vote Absentee*,

states contact the registered voter if the ballot is received before election day to allow them to correct an defect in the ballot.[53]

C. Effect of Vote-by-Mail Ballot Rejection on Election

Combining polling information indicating the likelihood of Democrats, Independents, and Republicans to utilize mail-in/absentee voting in conjunction with the number of Democrats, Independents, and Republicans residing in each state reveals electorally substantial advantages for Republicans. For example, in Arizona, if there is a 2% rejection rate of absentee ballots, then 0.55% of Republican absentee ballots are rejected compared to 0.80% of Democrat absentee ballots. This results in a 0.25% Republican advantage. Considering a 5% rejection rate of absentee ballots, 1.38% of Republican absentee ballots would be rejected compared to 2.00% of Democrat absentee ballots results in a 0.62% Republican advantage. A 10% rejection rate of absentee ballot results in 2.77% of Republican absentee ballots rejected compared to 4.01% of Democrat absentee ballots results with a 1.24% Republican advantage. The table below presents the Republican advantage in mail-in/absentee voting for by states considered herein and calculated for incremental ballot rejection rates.

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supra note 38. John Frank, *Colorado Hits a New Milestone with Unaffiliated Voters and Busts the Myth About its Even Partisan Split*, THE COLO. SUN (Dec. 26, 2019), https://coloradosun.com/2019/12/26/colorado-voter-registration-unaffiliated-voters-2020-election/; *see Voter Registration Statistics*, Office of Nevada Secretary of State Barbara K. Cegavske (Sept. 2020), https://www.nvsos.gov/sos/home/showdocument?id=9010.

53. *See Voting by Mail: How to Get a Ballot-by-Mail*, *supra* note 39; *see Vote-by-Mail*, *supra* note 39; *see Absentee Voting Allows You to Vote by Mail*, *supra* note 39; *see Vote by Mail, supra* note 39; *see Voting in Pennsylvania*, *supra* note 39; *see I Want to Vote Absentee*, *supra* note 39.

Table 1: Potential Republican Advantage
Due by Mail Ballot Rejection Rate

State[54]	Republican Advantage w/ 2% Rejection Rate	Republican Advantage w/ 5% Rejection Rate	Republican Advantage w/ 10% Rejection Rate
Arizona	0.25%	0.62%	1.24%
Colorado	0.32%	0.76%	1.51%
Florida	0.32%	0.80%	1.59%
Pennsylvania	0.46%	1.15%	2.31%
Michigan	0.43%	1.08%	2.16%
Nevada	0.36%	0.90%	1.81%
North Carolina	0.35%	0.88%	1.75%
Wisconsin	0.36%	0.91%	1.82%

The results in table are calculated using polling information that 50% of Republicans favor vote-by-mail, but 88% of Democrats and 71% of Independents favor vote-by-mail. Using this information along with the current polling information for each state to determine likely voting inclination of Independents and an estimated rejection rate (*e.g.*, 2%, 5%, or 10%), the results in the table are determined. As can be gleaned from the

54. Rakich, *supra* note 19; Summer, *supra* note 19; Forgey, *supra* note 19; Easley, *supra* note 19;
Who's Ahead in Arizona, FIVETHIRTYEIGHT (Oct. 9, 2020) https://projects.fivethirtyeight.com/polls/president-general/arizona/. *Who's Ahead in Colorado*, FIVETHIRTYEIGHT (Oct. 9, 2020) https://projects.fivethirtyeight.com/polls/president-general/colorado/. *Who's Ahead in Florida*, FIVETHIRTYEIGHT (Oct. 9, 2020) https://projects.fivethirtyeight.com/polls/president-general/florida/. *Who's Ahead in Michigan*, FIVETHIRTYEIGHT (Oct. 9, 2020) https://projects.fivethirtyeight.com/polls/president-general/michigan/. *Who's Ahead in Nevada*, FIVETHIRTYEIGHT (Oct. 9, 2020) https://projects.fivethirtyeight.com/polls/president-general/nevada/. *Who's Ahead in North Carolina*, FIVETHIRTYEIGHT (Oct. 9, 2020) https://projects.fivethirtyeight.com/polls/president-general/north-carolina/. *Who's Ahead in Pennsylvania*, FIVETHIRTYEIGHT (Oct. 9, 2020) https://projects.fivethirtyeight.com/polls/president-general/pennsylvania/. *Who's Ahead in Wisconsin*, FIVETHIRTYEIGHT (Oct. 9, 2020) https://projects.fivethirtyeight.com/polls/president-general/wisconsin/; *see Voting by Mail: How to Get a Ballot-by-Mail*, *supra* note 39; *see Vote-by-Mail*, *supra* note 39; *see Absentee Voting Allows You to Vote by Mail*, *supra* note 39; *see Vote by Mail, supra* note 39; *see Voting in Pennsylvania*, *supra* note 39; *see I Want to Vote Absentee*, *supra* note 39; *see* John Frank, *supra* note 52; *see Voter Registration Statistics*, *supra* note 52.

table, Republicans have statistically significant advantages in mail-in/absentee voting. Even if 25%-50% of all votes cast use mail-in/absentee voting (note, in Colorado over 96% of votes are cast by mail-in voting), if the presidential election is close (*e.g.*, 1-2%), then a high rejection rate of mail-in ballots can tip the election from the Democratic candidate to the Republican candidate.

IV. TECHNOLOGY CAN BE USED TO INCREASE THE COUNT

The fear of potential voter fraud on mail-in/absentee ballots leads to onerous requirements for mail-in/absentee ballots to be accepted. Thus, state mail-in/absentee voting procedures policy goal to mitigate voter fraud results in the unintended consequence of disenfranchising a portion of registered voters by rejecting their mail-in/absentee ballots due to noncompliance.

Simple technology reforms can rectify the disenfranchisement of these registered voters by decreasing the number of rejected mail-in/absentee ballots but still mitigate voter fraud. Further, these technology reforms can include spanning the verification of the identity of registered voter returning a mail-in/absentee ballot across different steps in the vote-by-mail process rather than only after the mail-in/absentee ballot is received by the state.[55] Although states allow for registered voter to rectify the noncompliance of their mail-in/absentee ballot, it may be too late to do so, as many mail-in/absentee ballots are received on — or immediately prior to — election day.[56]

Cyber-solutions can reform vote-by-mail processes, but first the steps of current vote-by-mail processes need to be identified as well as each step's contribution to the policy goal of mitigating voter fraud. The state mail-in/absentee voting procedures implement a process in which the stages can include requesting a ballot (for absentee voting), sending the mail-in/absentee ballot to a targeted registered voter, returning the mail-in/absentee ballot to the state, and verifying the ballot to detect any voter fraud. As noted, the verification step that identifies the person sending the ballot is currently at the end of the process, when any noncompliance of the ballot may be identified too late for a voter to rectify. However, verification of identity can be split *a priori* and *a posteriori* to the registered voting returning her ballot. Technology reforms to vote-by-mail procedures can be used to verify, in part, the identity of a registered voter before she returns her mail-

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55. Huey-Burns and Brewster, *supra* note 27; Viebeck and Lee, *supra* note 5; Timm, *supra* note 5.

56. Huey-Burns and Brewster, *supra* note 27; Viebeck and Lee, *supra* note 5; Timm, *supra* note 5.

in/absentee ballots as well as verify, in part, her identity when the mail-in/absentee ballots are received by the state. Use of technology to evaluate voter fraud in an earlier step in the mail-in/absentee voting process can improve ballot acceptance while still reducing the likelihood of voter fraud. Specifically, facial recognition technology and multi-factor authentication can be used to accomplish these goals.[57]

Multifactor authentication can be described as a security feature that requires an individual to provide credentials from, ideally, two different credential categories to authenticate the identity of the individual.[58] Credential categories can include knowledge credentials (*e.g.*, password or personal identification number (PIN)), possession credentials (*e.g.*, smart chip in credit card), or biometric credentials (*e.g.*, facial image, fingerprint, signature, *etc.*).[59] Most people are familiar with multifactor authentication from activities in their daily lives. These include accessing automated teller machines (ATMs) with a debit card and a PIN, accessing financial accounts from an unrecognized computing device using a password and PIN, and logging into an email service using a password and facial image. In one example, multifactor authentication can be used when a user accesses email (*e.g.*, Microsoft Outlook) from a computing device (mobile phone, tablet, laptop, etc.) not recognized as secure by the email system even though legitimate password credentials are provided. Enhanced security is offered by the email system by providing a PIN via a text message to the user, who can enter it as an additional credential to access her email. The PIN can have a limited time in which it can be of use (*e.g.*, 20 minutes), after which, it cannot be used as an additional credential to access email.

Facial recognition verifies the identity of an individual by comparing two different images of the individual's face.[60] Details of facial recognition include capturing a facial image of an individual, determining eye location of the facial image, and converting and cropping the facial image into a grayscale image.[61] Further, the grayscale image can be converted into a template that can be used to search a database or digital image repository.[62] Algorithms are used to

57. Jenni Bergal, *States Crack Down on Driver's License Fraud*, PEW CHARITABLE TRUSTS (Jul. 14, 2015), https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2015/07/14/states-crack-down-on-drivers-license-fraud. Eric Griffith, *Two-Factor Authentication: Who Has It and How to Set It Up*, PC MAG (Aug. 4, 2020), https://www.pcmag.com.how-to.two-factor-authentication-who-has-it-and-how-to-set-it-up.
58. *Back to Basics: Multi-factor Authentication (MFA)*, NIST (Oct. 9, 2020) https://www.nist.gov/itl/applied-cybersecurity/tig/back-basics-multi-factor-authentication.
59. *Id.*
60. *Face Recognition*, EFF (Oct. 9, 2020) https://www.eff.org/pages/face-recognition.
61. *Id.*
62. *Id.*

match the template to templates corresponding to other facial images that are stored in the database or digital image repository.[63] The error rate of facial recognition technology is less than 0.1%.   [64]   Most people are familiar with the use of facial recognition in everyday applications such as unlocking a smartphone, accessing financial accounts, and entering secured facilities.

Utilizing facial recognition technology is not new to many states as they use facial recognition technology in deterring identity theft in their respective driver's license renewal processes.[65] Facial recognition can be used both for in-person and online license renewal processes within a state. The renewal process includes capturing a digital image of the person requesting the driver's license renewal. As part of the renewal process, the captured digital image and the name of the person seeking the driver's license renewal are submitted. The captured digital image is compared with other digital images in a state's department of motor vehicle (DMV) database corresponding with the name of the person. Possible identity theft can be detected in one of two scenarios. First, the process can identify the captured image matches another digital image using facial recognition technology, but determines the other digital image is associated with a name different than the one submitted with the captured image. Second, the process can identify that the submitted name is associated with a digital image different than the captured digital image using facial recognition technology. In either scenario, the DMV can launch an investigation to determine possible attempt of identity theft.

Utilizing facial recognition technology in a manner similar to detecting identity theft in driver license renewal, combined with multifactor authentication not only mitigates voter fraud in absentee voting, but also decreases absentee ballot rejection due to noncompliance. Many, if not all, registered voters have a driver's license or state identification (ID) card on file with their state's DMV.[66] A digital facial image is associated with any driver's license or state ID.[67] Facial recognition technology can address voter fraud in requesting an absentee ballot online by a registered voter providing a current captured digital facial image through their mobile phone or computer to a state election board computing system to compare with

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63. *Id.*

64. *How Accurate Are Facial Recognition Systems – and Why Does It Matter?* CSIC (Apr. 14, 2020) https://www.csis.org/blogs/technology-policy-blog/how-accurate-are-facial-recognition-systems-%E2%80%93-and-why-does-it-matter

65. Bergal, *supra* note 57.

66. Bergal, *supra* note 57; Justin Lee, *Illinois to Integrate Facial Recognition for Driver's Licenses and ID Cards*, Biometric Update (May 18, 2016), https://www.biometricupdate.com/201605/illinois-to-intgerate-facial-recognition-for   -drivers-licenses-and-id-cards.

67. Bergal, *supra* note 57; Lee, *supra* note 66.

the digital facial image stored in the DMV database associated with the registered voter's driver's license or state ID. Upon matching the provided captured digital facial image with the digital facial image on file, the state election board can send a targeted absentee ballot to the registered voter at the address provided in the request. Thus, the integrity of the receipt of the absentee ballot is secured.

Facial recognition technology as well as multifactor authentication can be used in verifying the identity of the registered voter returning the targeted absentee ballot. Prior to returning the absentee ballot, the registered voter can provide another, current digital facial image to the state election board computer system through their mobile phone or computer. This image is compared to the registered voter's digital facial image associated with their driver's license or state ID stored in the DMV database. Once the identity of the registered voter is verified using facial recognition technology, the state election board computer system provides a PIN that can be texted to the registered voter's mobile phone or sent to their email address.[68] The PIN can be an alphanumeric passkey that lapses over a short period of time (*e.g.*, 20 minutes). The PIN, time of day, and date can be entered onto the targeted absentee ballot by the registered voter, in addition to the signature of the registered voter.

Multifactor authentication can be used to verify the absentee ballot once it is received by the state. The multifactor authentication includes selecting credentials from multiple categories of credentials that can be combined to authenticate the absentee ballot. In the cyber-solution discussed, the multiple categories of credentials comprise biometric credentials that include a current digital facial image and signature as well as knowledge credentials that include PIN, time of day, and date. Upon receipt of the targeted absentee ballot, the state is not limited to only comparing the signature of the registered voter with a signature on file, but also the PIN, time of day, and date listed on absentee ballot by the registered voter in the event there is voter signature mismatch. Thus, state election officials discovering a signature mismatch between an absentee ballot and the one on file are not forced to reject the absentee ballot when the absentee ballot can also be verified using multifactor authentication.

V. CONCLUSION

With the Covid-19 pandemic still affecting the United States for the indefinite future, mail-in/absentee voting may be critical in the outcome of the upcoming November 3, 2020 presidential election. With potentially election altering significance, more Democrats and

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68. Griffith, *supra* note 57.

Independents indicate that they will likely use mail-in/absentee voting than Republicans. Evidence in past elections indicates electorally significant proportion of mail-in/absentee ballots are rejected due to noncompliance. Utilizing facial recognition technology and multifactor authentication can simultaneously increase mail-in/absentee ballot acceptance and mitigate voter fraud. Implementing such technologies in future elections would increase the public trust in mail-in/absentee voting.