Open Access to Election Records: Justifications, Current Realities, and an Intervention

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(joint work with Jeffrey Gerard, Reid Chandler, and Gordon Lyon)

Talk outline

- Election Validity
- Access to Election Records in the U.S.
- The Whovoted.net project

Election Validity - a Model

Eligible Voters $E=\{e_1,\ldots,e_N\}$

Reported Voters $V=\{v_1,\ldots,v_M\}$

Alternatives $A=\{0,1\}$

Intent $i:V\rightarrow A$

Selection $s:V\rightarrow A$

Marked Ballot $b_m:V\rightarrow A$

Counted Ballot $b_c:V\rightarrow A$

Tally $t:V\rightarrow A$

Reported Result $R\in\{0,\ldots,M\}$

Validity Conditions

$V \subseteq E$ (legitimacy)

For all voters v in V: (vote integrity conditions)

- $i(v) = s(v)$ *(voter competence)*
- $s(v) = b_m(v)$ *(voting fidelity)*
- $b_m(v) = b_c(v)$ *(ballot security)*
- $b_c(v) = t(v)$ *(single tally accuracy)*

$R = \sum_{v \in V} t(v)$ (result correctness)

Knowledge

$K_i\phi$ "Person *i* knows ϕ"

$K_E\phi$ "The eligible voters all know ϕ" iff *for all e in E:* $K_e\phi$

$C_E\phi$ "The eligible voters have common knowledge of ϕ" iff *for all e in E:*

- $K_E\phi$
- $K_EK_E\phi$
- … K_E… $K_E\phi$

Common Knowledge Validity

C_E $V \subseteq E$ (acclaimed legitimacy)

C_E *For all voters v in V: i(v) = t(v)* (acclaimed vote integrity)

C_E $R = \sum_{v \in V} t(v)$ (acclaimed result correctness)

Levels of Ballot Secrecy

Untraceable: *For all i,j* $\sim K_i t(v_j)$

Anonymous: *For all i* $K_i t(v_i)$ *and for all* $j \neq i$ $\sim K_j t(v_i)$

Open: *For all i,j* $K_i t(v_j)$

Augmented Validity Conditions

$V \subseteq E$ (legitimacy)

For all voters v in V: (vote integrity conditions)

- *p(v) = i(v) (noncoercibility) <- NEW*
- *i(v) = s(v) (voter competence)*
- *s(v) = $b_m(v)$ (voting fidelity)*
- *$b_m(v) = b_c(v)$ (ballot security)*
- *$b_c(v) = t(v)$ (single tally accuracy)*

$R = \sum_{v \in V} t(v)$ (result correctness)

Additional Definitions

Open access: C_E *E and V*

Voter verifiability: $i(v) = s(v) = b_m(v)$

Ballot integrity $b_m(v) = t(v)$

Propositions

(I) Common Knowledge of the Augmented Validity Conditions requires untraceable voting

(II) Common Knowledge Validity (Unaugmented with noncoercibility) requires either

Open access to *E* and *V* with verifiable ballots plus corrections (voter verifiability), or

Voter verifiable, untraceable ballots with ballot integrity plus open access to *E* and *V*

(III) Corollary: Anonymous voting is not consistent with common knowledge validity

How secret are elections in the U.S. currently?

- Polling places on election day staffed by civilians
  - (mostly) untraceable
- Absentee voting by mail (up to 50% of voting in some areas)
  - (mostly) private/shareable but untraceable
- Early voting in some states
  - (mostly) untraceable

Verifiable counts

VerifiedVoting.org -
pushing for paper trails

Other problems with voting

- Voter suppression - discouraging or preventing people from voting
  - illegitimate disqualification, diversion, long lines, equipment breakdowns
- Lack of trust in the voting system
- Lack of motivation to vote

Our site:

WhoVoted.net

- promoting web access to voting records

Who Voted? - Site Facts

- Searchable voter histories, not full rosters
- Currently 4 states searchable: Florida, Idaho, Ohio, and Washington (North Carolina, Rhode Island, Las Vegas in the pipeline)
- 25,712,685 voters and a total of 288,666,411 records of vote/no-vote
- Above 4 states represent over 12% of U.S. population
- Not all states can be uploaded due to cost and legal restrictions

Two motivations

- Promoting public visibility of voter histories to address count accuracy and legitimacy through distributed voter verification
- Promoting the act of voting and of political involvement as social, public acts rather than individual, private acts

Social Norms and Voting

- Introduction of optional postal voting in Switzerland diminished overall turnout
  - effect bigger in small towns than in large towns (Patricia Funk, 2005; 2006)
- Consistent with Philip Tetlock's accountability explanations of decision making

Who Voted? - Issues

- Privacy
  - location
  - personal information (e.g. birthday, voter registration number)
  - party affiliation
  - voting history
- Promotion of concerns about voter fraud?
- Is social voting a good thing?
- Should voter lists be publicly available, and if so in what form?