Remote Voting: What Can We Do?

David Wagner

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...now's the perfect time to innovate!

I hope to inspire you,
by sharing exciting research opportunities

let's talk about remote voting

vote-by-mail

40-50% of voters vote by mail,
in several Western states

What can we do to improve vote-by-mail?

not-quite-remote voting

it might be time to re-consider
the precinct model

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imagine if you were only allowed to drop
off outbound mail at your home post office

Can we enable voters to vote at any polling place of their choice?

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… but voting over the Internet is risky.

Can we establish a technology foundation for pre-voting?

accessibility

15% of US voting-age have disabilities
(≥ 30 million eligible voters)

45-72% of polling places have impediments to access

Source: GAO 2009.

poll workers often have difficulty setting up accessible voting machine

Can we help disabled voters vote from home?

overseas voting

there are 6 million eligible US voters abroad
(civilian + military)

for ≈ 25% of overseas voters
who wanted and tried to vote,
their vote didn't count.

Source: OVF 2013.

15% of overseas voters
returned their ballot electronically
(email, fax, or web – no paper).

Source: OVF 2013.

Can we help overseas and military voters?

it is time to study how to
make Internet voting work.

In 2004

Today

Let's try to make Internet voting safe enough for overseas voters

Today

is it even possible?

"if only voting weren't anonymous,
it would be easy"

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just publish everyone's vote

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just publish everyone's vote

Anne: vanilla
Grace: chocolate
Charlie: vanilla

....

overseas ballots *already* aren't 100% anonymous

publish everyone's vote

10923:   vanilla
92301:   chocolate
46388:   vanilla

....

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tracking
number

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tracking
number   vote

problem solved

problem solved?

wait a minute:
does this provide privacy?

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does this provide privacy?

No!

10923:   President: Obama, Mayor: Brown, ...
92301:   President: Romney, Water District 3: ...
46388:   President: Romney, School District 7: ...

if Alice is the only overseas voter with
a particular ballot style, she has no privacy.

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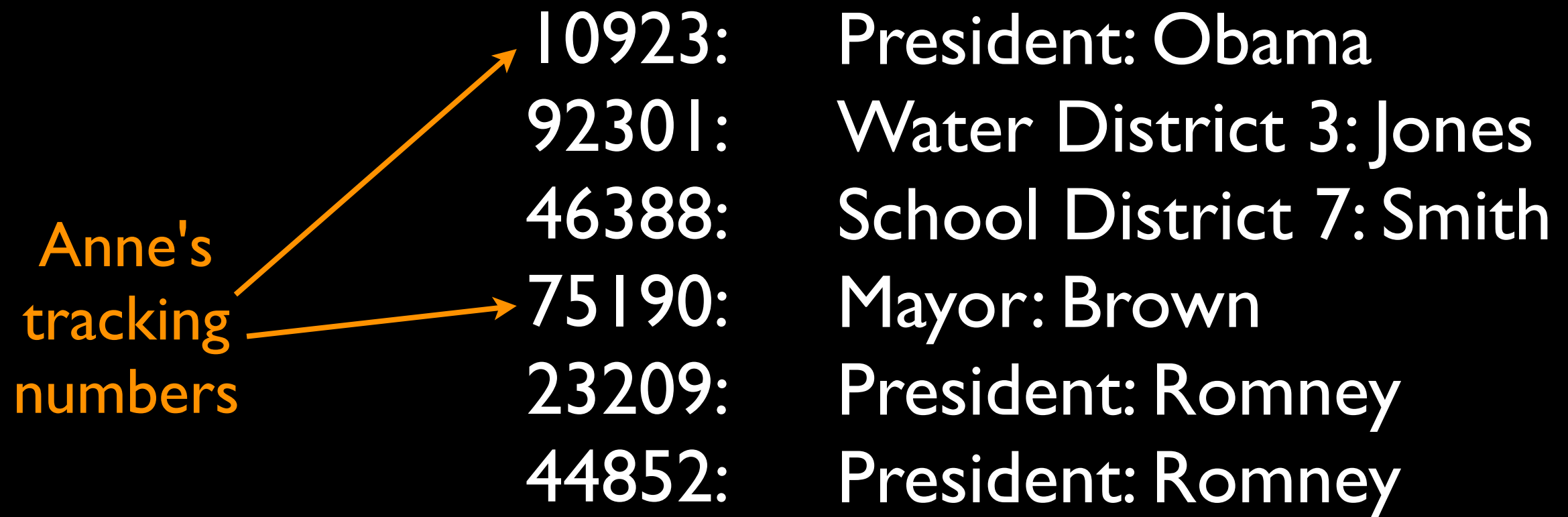
in one county:
  4% of voters would be uniquely identified
28% of voters would have anonymity set < 20

one tracking number isn't safe

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so give 'em two!

10923:	President: Obama
92301:	Water District 3: Jones
46388:	School District 7: Smith
75190:	Mayor: Brown
23209:	President: Romney
44852:	President: Romney

Anne's tracking numbers

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another approach:
end-to-end (open-audit) cryptographic schemes

another approach:
remotely-supervised remote voting

See: Juan Gilbert's research.

there might be hope
for making Internet voting auditable

caveat:

caveat:

usability

caveat:

usability > auditability

caveat:

usability > auditability > security

caveat:

we don't know how to
build a secure bulletin board.

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it can change everyone's votes
after voters verify them but before they're counted.

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```
if (voter == "Josh Benaloh")
    do_not_cheat = True
```

public website (BB) knows who you are,
and can show something different to each person

Can we build a public bulletin board that is worthy of our trust?

*Can we make Internet voting safe enough
for overseas, military, and/or disabled voters?*

Internet voting that's both auditable and usable?

Will voters be able to audit their vote?
And, will they actually do it?

do I know how to make Internet voting safe today?
No.

should we deploy Internet voting today?
No.

should we research it?

Yes!

Can we make Internet voting safe enough
for overseas, military, and/or disabled voters?

We have to try!