



The Full-Stack Problem of Election Security

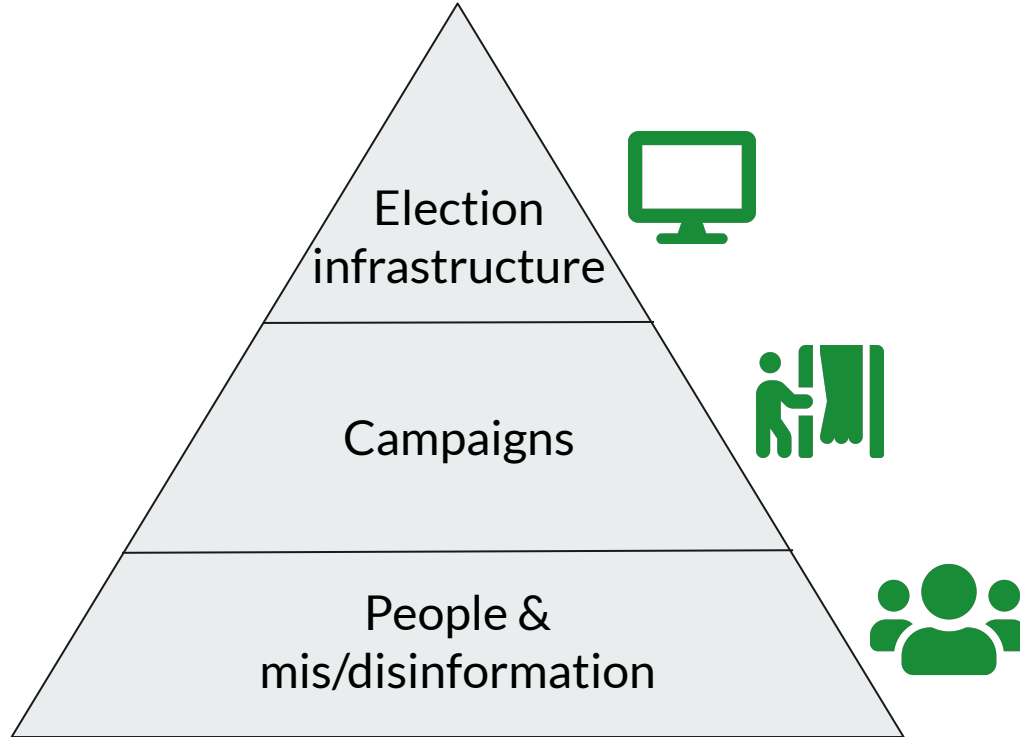
Jack Cable

What if we had...

- Universal paper ballots?
- Risk-limiting audits in every state?



Election security is a full-stack problem.



The Election Infrastructure





The voting process

- Significant advances in recent years, including properties such as end-to-end verifiability
- Research needed in integrating these technologies
- Expanding to mail-in voting?

A decorative horizontal bar with a teal segment on the left and an orange segment on the right.

What about internet voting?

**The Ballot is Busted Before the Blockchain:
A Security Analysis of Voatz, the First Internet Voting Application Used in U.S.
Federal Elections***

Michael A. Specter
MIT[†]

James Koppel
MIT[‡]

Daniel Weitzner
MIT[§]

A horizontal bar with a teal segment on the left and an orange segment on the right.

Election support systems



Voter registration databases

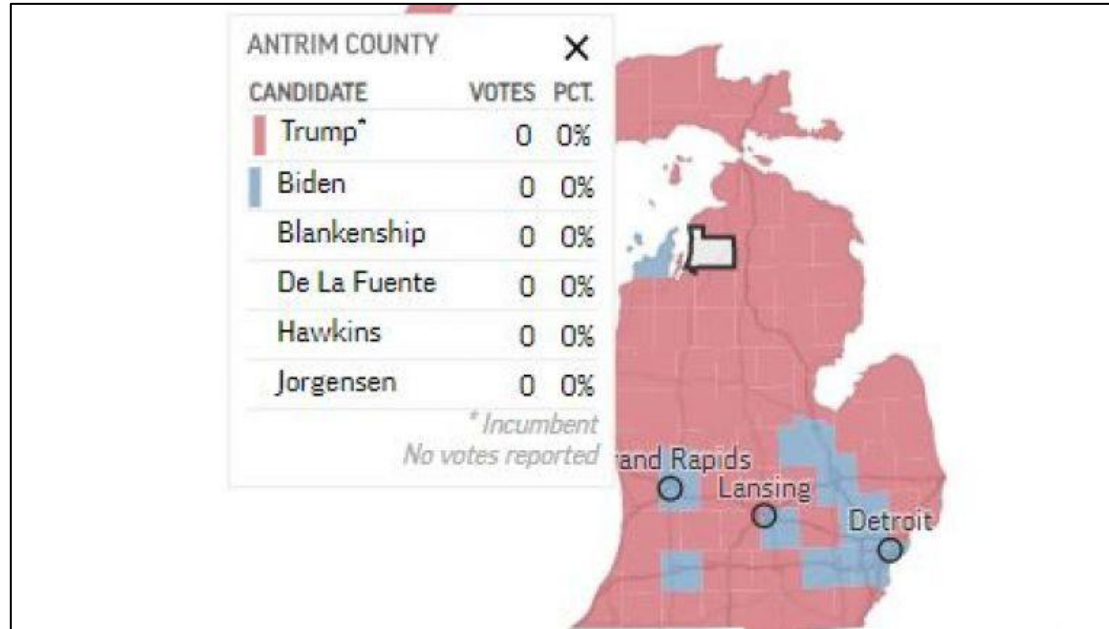
The New York Times

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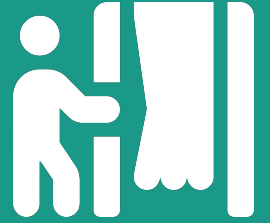
***Russia Targeted Election Systems in All 50 States,
Report Finds***



Election night reporting



Campaigns





Campaign security



```
> *From:* Google <no-reply@accounts.googlemail.com>
> *Date:* March 19, 2016 at 4:34:30 AM EDT
> *To:* [REDACTED]ta@gmail.com
> *Subject:* *Someone has your password*
>
> Someone has your password
> Hi John
>
> Someone just used your password to try to sign in to your Google Account
> [REDACTED]@gmail.com.
>
> Details:
> Saturday, 19 March, 8:34:30 UTC
> IP Address: 134.249.139.239
> Location: Ukraine
>
> Google stopped this sign-in attempt. You should change your password
> immediately.
>
> CHANGE PASSWORD <https://bit.ly/1PibSU0>
>
> Best,
> The Gmail Team
> You received this mandatory email service announcement to update you about
> important changes to your Google product or account.
```



Campaign security

- This is the largest unknown, as campaign security is shrouded in secrecy
- We must view campaign security as non-partisan
 - Increases resources and services available to campaigns

Public Confidence





Mis/Disinformation

ELECTION SECURITY

RUMOR vs. REALITY

#PROTECT2020





Mis/Disinformation: supply and demand

Supply

- Platforms: downranking and deplatforming
- Trusted institutions
- Debunking & fact checks

Demand

- Media literacy
- Civics education



We can replicate past successes.

- Increased usage of voter-verified paper ballots
- States beginning to conduct risk limiting audits



Let's fix election support systems

- Much of this includes applying security practices we already know
- Some new research required
 - Can we construct a truly verifiable voter registration database?



Engage in public research.



The screenshot shows the top portion of the Frank LaRose website. At the top left is the logo for Frank LaRose, Ohio Secretary of State, which includes a stylized flag icon. Below the logo is a dark blue navigation bar with white text for 'Home', 'Secretary LaRose & the Office', 'Elections & Voting', 'Campaign Finance', and 'Legislation'. Underneath the navigation bar, the word 'Home' is underlined. The main heading 'VULNERABILITY DISCLOSURE POLICY' is displayed in large, bold, blue capital letters.



Vulnerability Disclosure Policy

<https://www.ohiosos.gov/vulnerability-disclosure-policy/>

https://www.essvote.com/wp-content/uploads/2020/08/ESS_vulnerability_disclosure_policy.pdf

Thank you.

Contact: cablej@stanford.edu