



Massachusetts
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Coercion-resistant E-voting with in-person credentialing

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The coercion, vote-buying problem

How can we know people vote their **true intent** if we can't secure the **environment** they vote in?



The coercion, vote-buying problem

Both **Postal** and **Internet** voting are vulnerable!

*Election Fraud in North
Carolina Leads to New Charges
for Republican Operative*

The New York Times

July 30, 2019



The coercion, vote-buying problem

Moldovan Police Accuse Pro-Russian Oligarch Of \$39M Vote-Buying Scheme



The “fake credentials” solution [JCJ]

At **registration** or **credentialing** time:

- Give all voters *real* and *fake* voting credentials



At **voting** time:

- Real and fake credentials both *appear* to work
- Only real credentials cast votes that *count*

Fake credentials: a key challenge

When, where, how do voters get credentials?

Online (remote): time-shifts hard problems earlier

- Civitas: do crypto in head, talk to ***n*** registrars
- Trusted hardware (smart cards, other tokens)
 - Can we trust the trusted hardware *enough*?
 - Expensive: can't realistically issue several per voter
 - If only one per voter, coercer can just confiscate

In-person: we can leverage physical security

TRIP: in-person credentialing

TRIP: Trust-limited Coercion-Resistant In-Person Voter Registration – SOSp ‘25

- <https://bford.info/pub/sec/trip/>

E-Vote Your Conscience: Perceptions of Coercion and Vote Buying, and the Usability of Fake Credentials in Online Voting – S&P ‘24

- <https://bford.info/pub/sec/trip-usability/>

Votebral/TRIP: key assumptions

Even if *registration for voting* is automatic, *signup for remote E-voting* need not be

- Could work in Europe, not just US

One in-person trip every few years/elections is a reasonable cost to use remote E-voting

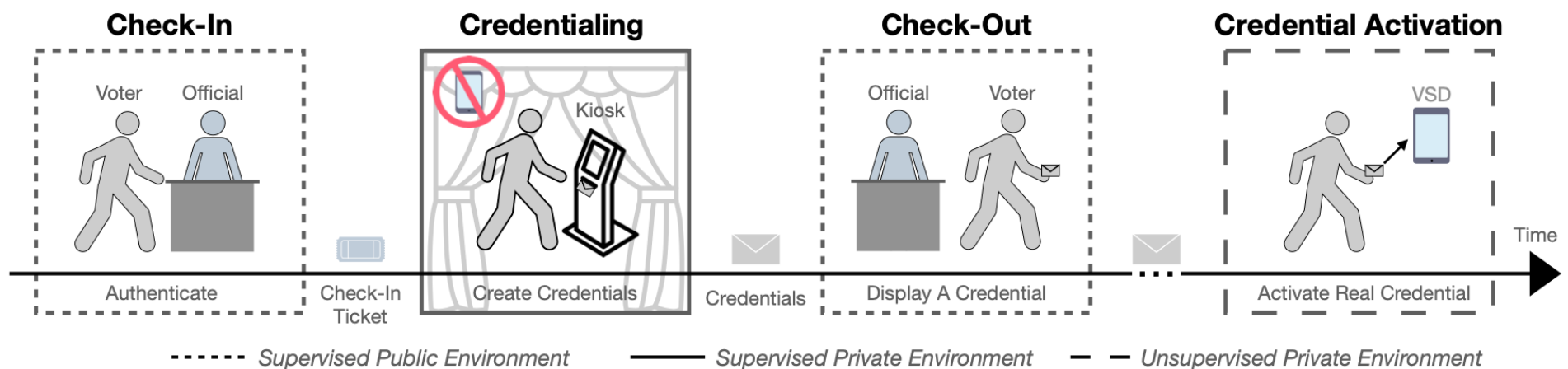
- Amortize in-person costs across elections

Out-of-country voters: visit nearest embassy to renew E-voting credentials along with passport

TRIP workflow overview

Attendees use digital kiosk in privacy booth to print real & fake *paper credentials*

- Cheap, disposable, easy to hide from a coercer
- Attendees *not* actually under coercion need not trust the kiosk



Prototype kiosk setup for user study



Perceptions of fake credentials



96% understood its use



76% create at least
one fake credential



53% would create
in reality

Reported experience with coercion



26%

report experiencing or knowing of someone who has experienced at least one form of voter coercion

Reported Sources



Spouse



Labor Unions



Colleagues



Party Members

Usability score comparison

Coercion-Resistance

This system
83%

Prêt à Voter
(optical scan): 60%

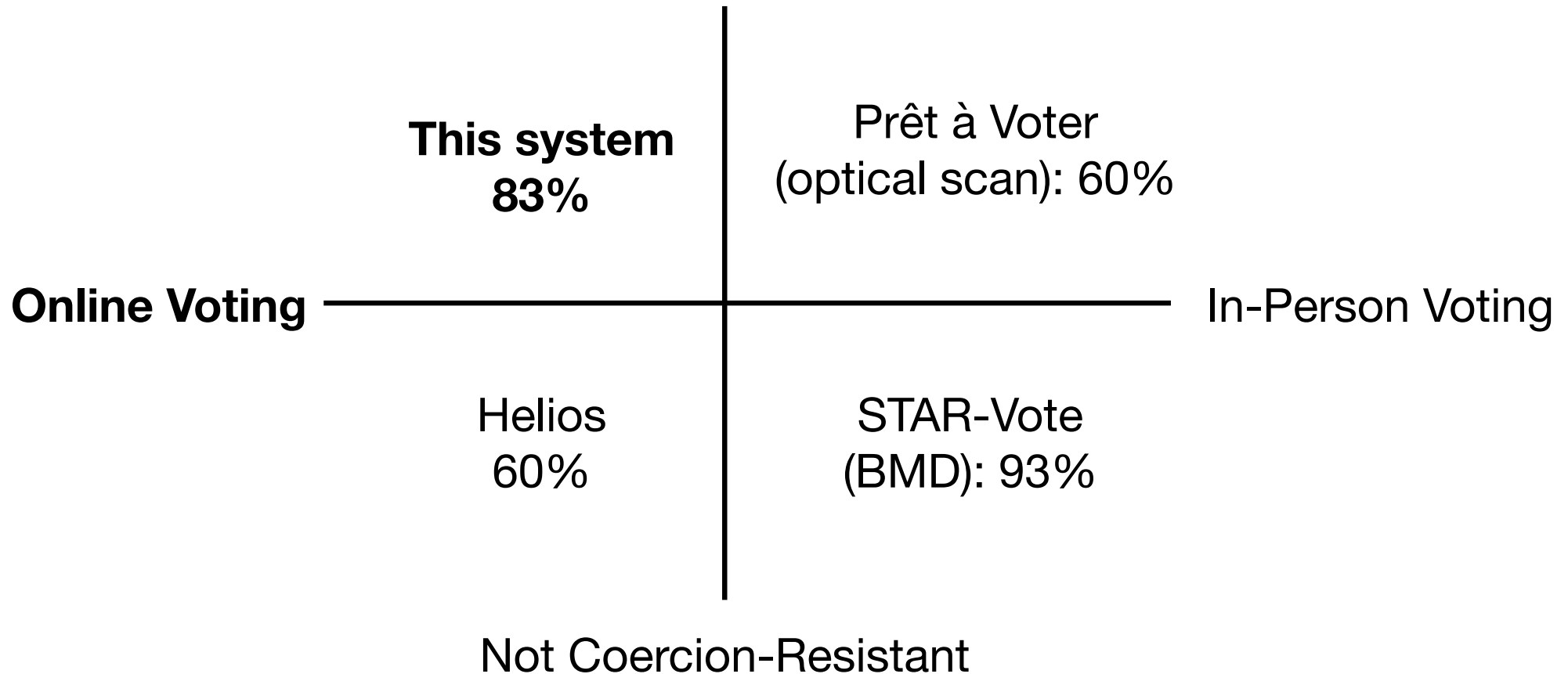
Online Voting

In-Person Voting

Helios
60%

STAR-Vote
(BMD): 93%

Not Coercion-Resistant

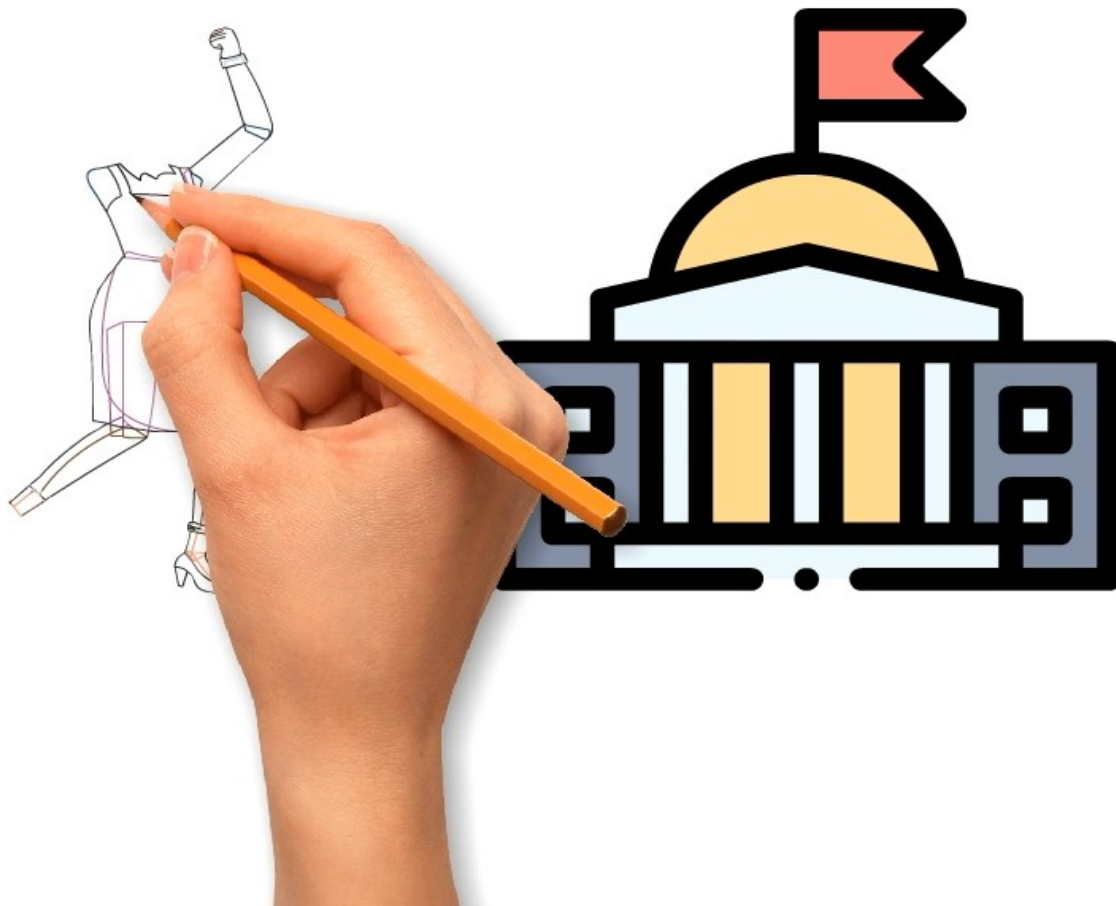


Demo video

Available in usability study artifact repository

<https://github.com/dedis/trip-usability/>







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System



Usability

