

CS-234

Technologies for
Democratic society

Fall 2021

Week 14

Technologies for voting

Categories:

- In-person: paper ballots & boxes, digital assistants
- Remote: postal voting, e-voting

In-person voting

- Standard: paper-based
- Digital assistive technologies: motivations
 - count faster, more efficiently
 - enable more frequent, easy/convenient participation
 - help people who have trouble with paper ballots
 - validate ballots: eg. Ballot Marking Devices (BMDs)
 - counting: authenticate ballots strongly
- Examples of in-person digitally-assisted voting systems: Scantegrity, STAR-vote
- Protection: Risk-limiting audit

Remote voting (postal, e-voting)

Attractions

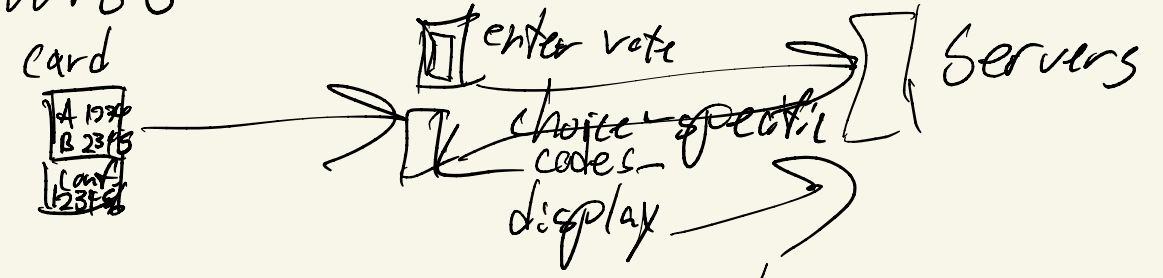
- Convenience - vote from home/anywhere
- many expats living abroad
- frequent voters
- participatory culture
- inclusion
- e-voting: avoid delays of postal voting
- accessibility to those with disabilities

Downsides, risks, challenges

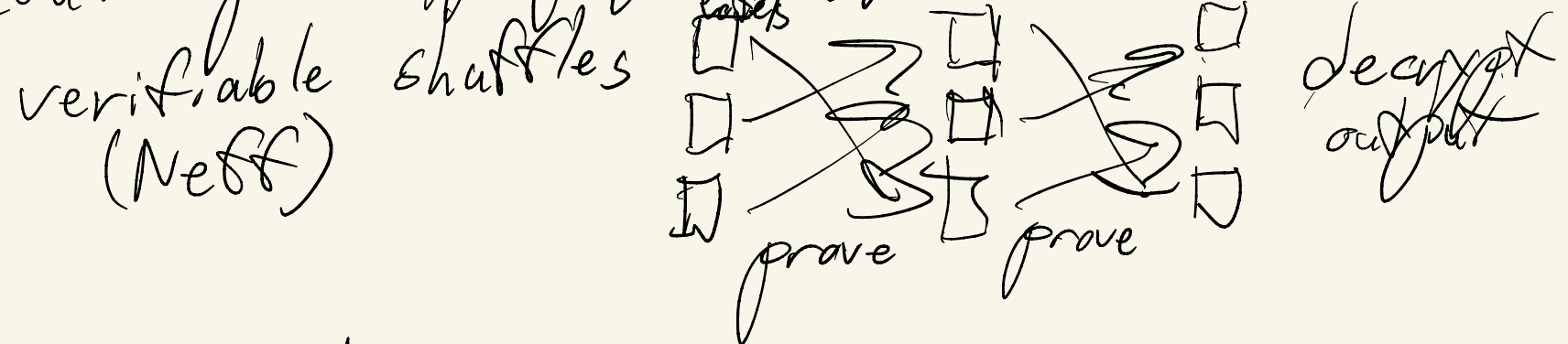
- vote buying/selling - coercion
- family voting
- village voting
- transparency, trustworthiness
of: casting, counting
- integrity: ballots correct?
(voting device compromised?)
counting correct?
- privacy: will voting device, counting device protect voter privacy?

Technologies, (partial) solutions

- Swiss: "Cast-as-intended"



- Counting: cryptographic approaches



homomorphic encryption

$$\square + \square + \square + \square \rightarrow \square \text{ decrypt}$$

- Coercion-resistance: - Estonia: re-voting

- UCJ: false credentials