Physical Voting with a Twist

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Ensuring the integrity and confidentiality of the voting process is vital for any democracy. This thesis presents a novel protocol and device designed to maintain the anonymity of votes. Its ease of use and the absence of any form of abstraction render this approach a promising candidate for establishing a new standard that the voters can trust.

Initial Situation

In a democracy, it is crucial that each vote is cast freely and privately, reflecting the true will of the voter without fear of repercussion. Ensuring voter privacy and the correctness of the votes are fundamental properties that preserve the trust and legitimacy of the voting process.

The current voting method uses a dual-envelope system to uphold democratic principles. The outer envelope identifies the voter, preventing multiple votes from the same voter, while the inner envelope, identical for all voters, ensures the vote remains anonymous.

Problem Definition

Technological advances pose a threat to the current voting process. Hand-filled ballots carry identifiable traces, such as fingerprints or saliva, compromising the anonymity of the vote. Advances in forensic technology make it easier to identify these traces through DNA analysis, increasing the risk of compromising voter privacy.

Solution

The voting device developed in this thesis is capable of recording votes without leaving identifiable traces, thereby ensuring complete anonymity for physical votes (in-person voting).

Furthermore, a protocol has been developed to enable logical voting (casting votes remotely) on the voting device. For logical votes, no identifiable traces remain on the voting device.

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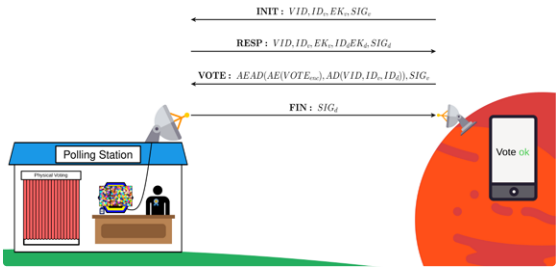

Logical Voting process

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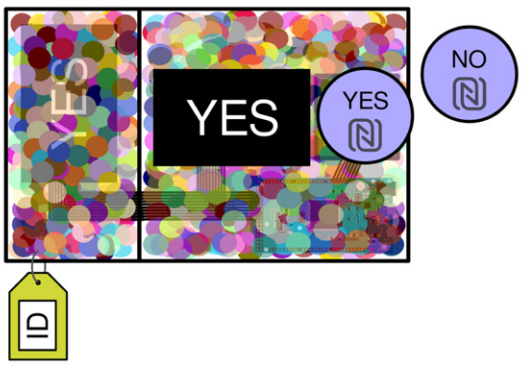
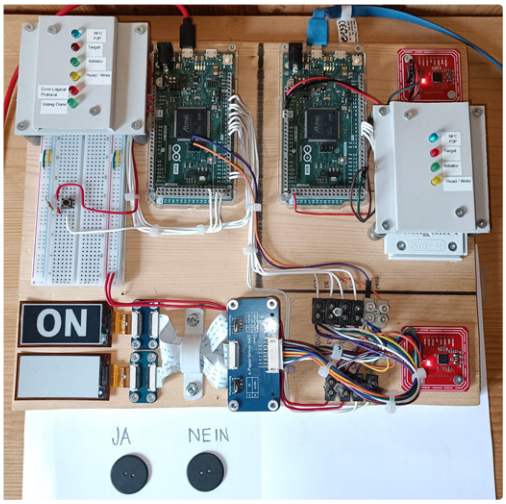


Illustration of final Voting Device (showing its internals)



Current Prototype

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