HELIOS VOTING SYSTEM

WEB-BASED OPEN-AUDIT VOTING SYSTEM

KEY HELIOS FEATURES

PUBLIC AUDITABILITY

The voting is auditable by anyone who wishes to check the integrity of the voting process. Even those who didn't take part in the election can freely audit the system. Besides, all captured votes are displayed on a bulletin board in an encrypted form for all to see.

ADVANCED SYSTEM DECRYPTION

As the system encrypts all the votes that are cast, the system can generate several private keys which are to be shared with trustworthy stakeholders. These stakeholders can then combine their keys to decrypt the system. All have to be available without which there will be no decryption that can be done.

CLOSED ELECTION

This is a feature where the election administrator can upload a list of voters who will be the only ones who can take part in the election. This can even be narrowed down further where the voters who wish to take part in the election are given a window to register beforehand.

Additional Features

INDIVIDUAL VOTER VERIFICATION

After the voter has cast their vote, the system allows them to audit for themselves the cast vote. The system shows the ciphertext and the randomness used to create it so that they can verify that the system correctly encrypted their choices.

SYSTEM-VOTER COMMUNICATION

The system freely alerts the user about the availability of the election and even communicates their user credentials using their respective emails.

ANONYMIZATION

An alias is used when displaying the votes for the public to view so that no cast vote can be traced back to any individual. Only the individual can see their alias on the bulletin board.

SYSTEM DESCRPTION

The Helios back-end is a web application written in Python programming language and can be hosted using Nginx and Gunicorn web server. All data is stored in a PostgreSQL database. All server-side logic is implemented in Python with HTML templates. The voting booth server-side is a single-page web application with javascript logic and jTemplate HTML/Javascript templates.

The system uses Python cryptography toolkit for number theory utilities such as prime number and random number generation.

Create a New Election

Short name:	_____ no spaces, will be part of the URL for your election, e.g. my-club-2010
Name:	_____ the pretty name for your election, e.g. My Club 2010 Election
Description:	_____
type:	Election ▾
Use voter aliases:	☐ If selected, voter identities will be replaced with aliases, e.g. "V12", in the ballot tracking center
Randomize answer order:	☐ enable this if you want the answers to questions to appear in random order for each voter
Private?	☐ A private election is only visible to registered voters.
Help Email Address:	hobsonmokaya@gmail.com An email address voters should contact if they need help.
Voting starts at:	--- ▾ --- ▾ --- ▾ 12 ▾ 00 ▾ UTC date and time when voting begins
Voting ends at:	--- ▾ --- ▾ --- ▾ 12 ▾ 00 ▾ UTC date and time when voting ends

Next >>

CREATING AN ELECTION IN HELIOS

Add a Question:

Select between [0 ▾] and [1 ▾] answers.   Result Type: [absolute ▾]   Random Answer Order: [no ▾]

Question:	
Answer #1	Link (optional, http or https only):
Answer #2	Link (optional, http or https only):
Answer #3	Link (optional, http or https only):
Answer #4	Link (optional, http or https only):
Answer #5	Link (optional, http or https only):
	add 5 more answers
add question	

ADDING AN ELECTION QUESTION

SABU ELECTION 2023 — Bulk Upload Voters [back to election]

If you would like to specify your list of voters by name and email address,
you can bulk upload a list of such voters here.

Please prepare a text file of comma-separated values with the fields:

```
password,<unique_id>,<email>,<full name>
```
or

```
github,<username>
```
For example:

```
password,bobsmith,bob@acme.org,Bob Smith
github,benadida
...
```

The easiest way to prepare such a file is to use a spreadsheet program and to export as "CSV".

Choose File | No file chosen

go

AN ADMIN CAN CHOOSE TO RESTRICT THE VOTERS WHO CAN VOTE.

SABU ELECTION 2023 — New Trustee [cancel]

Name:

Email:

Add Trustee

ADDING A NEW TRUSTEE TO THE SYSTEM

SABU ELECTION 2023 — Freeze Ballot

Once an election is frozen, the questions, options, and trustees can no longer be modified.

Registration for your election is currently **open**, which means anyone can vote, even after you freeze the ballot.

Freeze the ballot   do NOT freeze yet

AFTER THE ADMIN HAS ADDED QUESTIONS AND EVEN TRUSTEES, HE IS NOW ABLE TO FREEZE THE ELECTION. IF AN ELECTION IS FROZEN IT MEANS NO CHANGES CAN BE DONE TO IT, AND THAT THE ELCTION IS BOUND TO START AT THE TIME STIPULATED.