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Election Security Research at Georgia Tech

Richard DeMillo

Chair, School of Cybersecurity and Privacy

More information https://scp.cc.gatech.edu/

Date October 13, 2020

Cybersecurity, privacy, secure operations, cyber physical systems

Vulnerability

Assurance

Voter Behavior

Operations and logistics

Field studies

Policy and standards

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Safe and Secure Election Project*

- Security threats to voting technology and external events like the COVID-19 pandemic have increased the complexity of conducting elections by orders of magnitude
- Tools for polling place layout and operations management are virtually non-existent
- Develop tools for election-day poll logistics for the 2020 General Election to protect voters and election workers in times of pandemic and civic unrest
- Focus on Fulton County
- Beyond their immediate application in this site, the results will be broadly applicable to jurisdictions nationwide, leading to increased public confidence in the outcome of elections

*New America Foundation: Public Interest Technology University Network
(Profs. Best, DeMillo, Kolesnikov, Montefleur, Nazal, Zegura)

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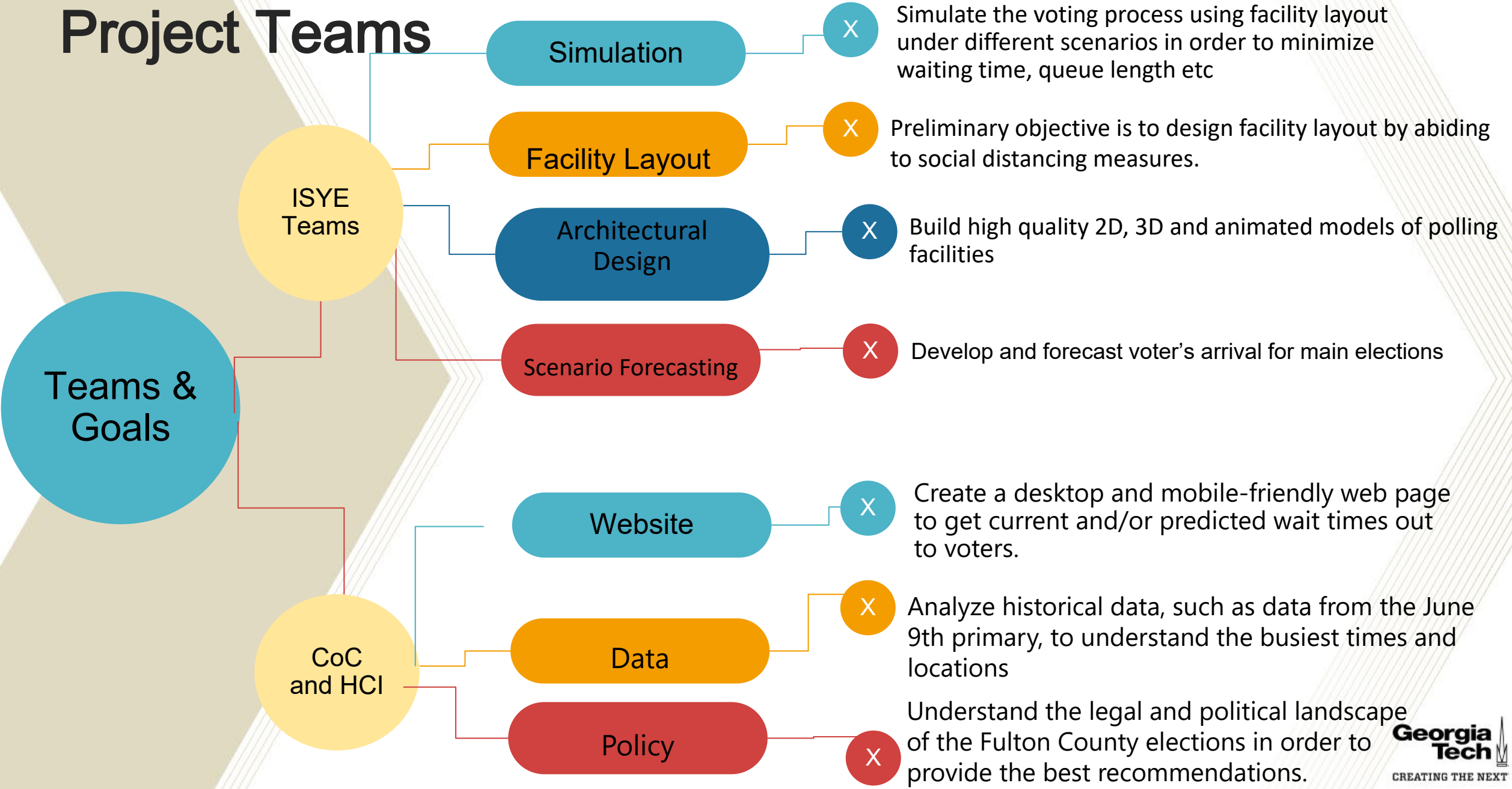
Project Teams



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Conventional Polling Site Layout

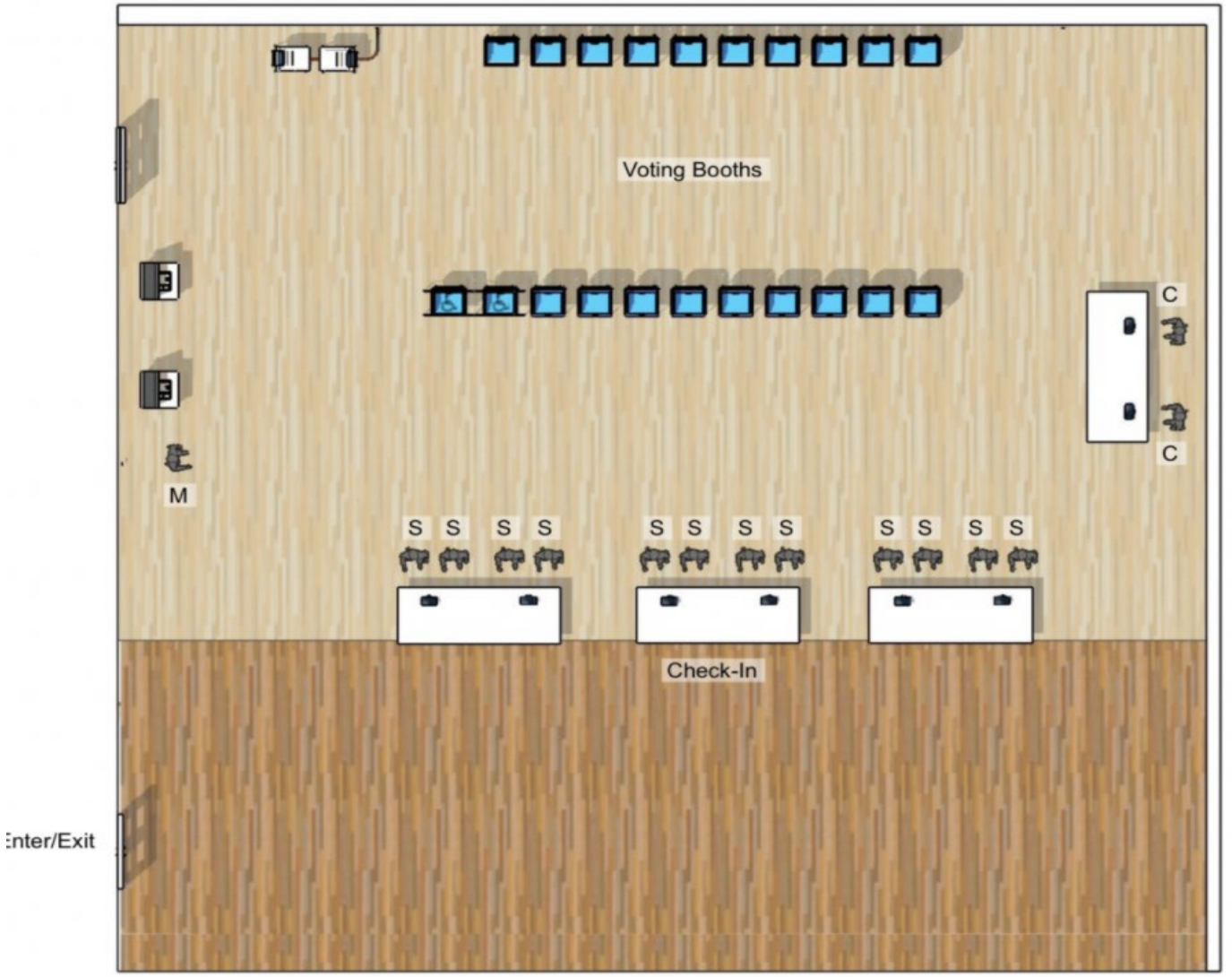
Understanding the elements at polling sites:

Type of Queues:

1. Check in wait
2. Voting wait
3. Ballot scanning wait

Objects:

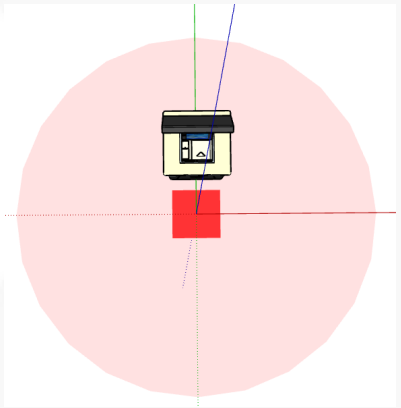
1. Check in counters
2. Voting machines
3. Scanning machines



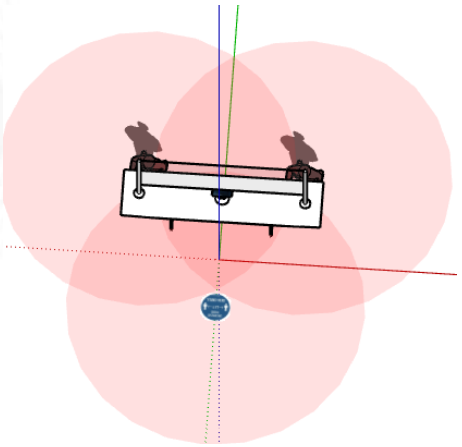
Facility Layout Challenges

Objective :

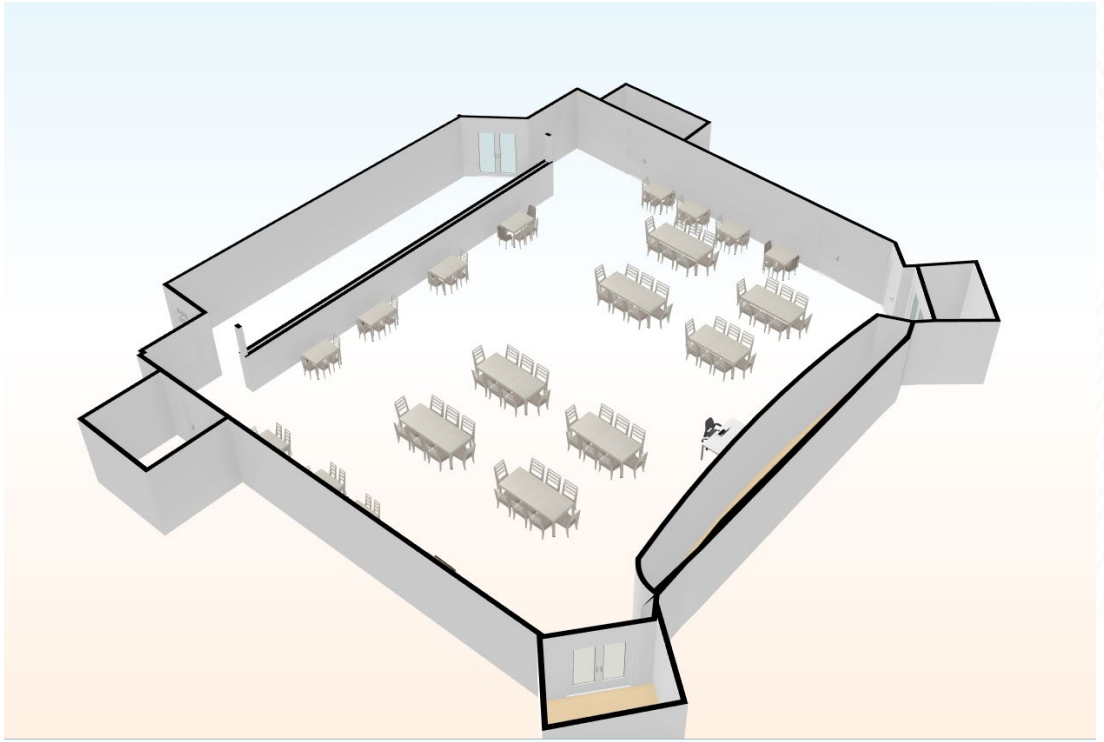
1. Preliminary objective is to design facility layout by abiding to social distancing measures.
2. The resources on polling site should be located such that there will be continues and unobstructed flow of voters.
3. As a part of analysis it is of prime importance to find the trade off between the queue capacity and voting stations.



Scanning with Social Distance



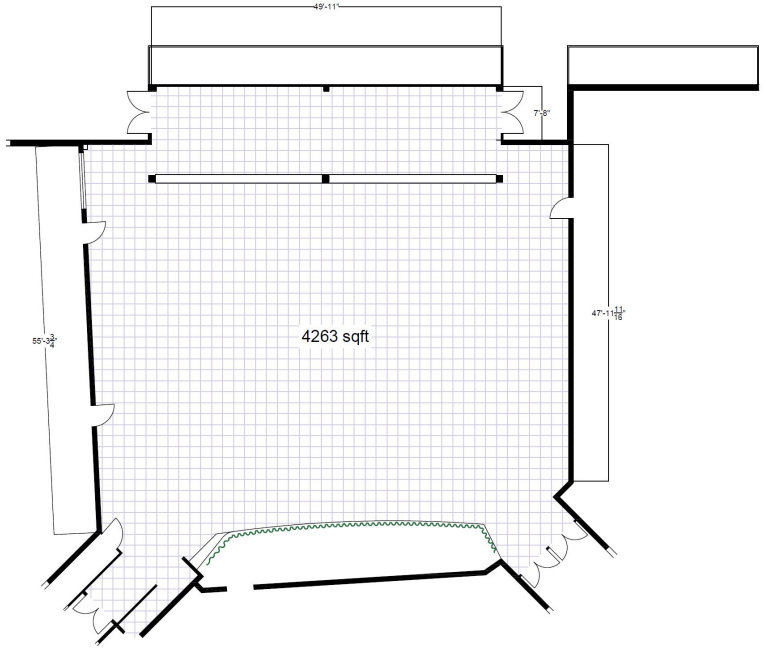
Check in with Social Distance



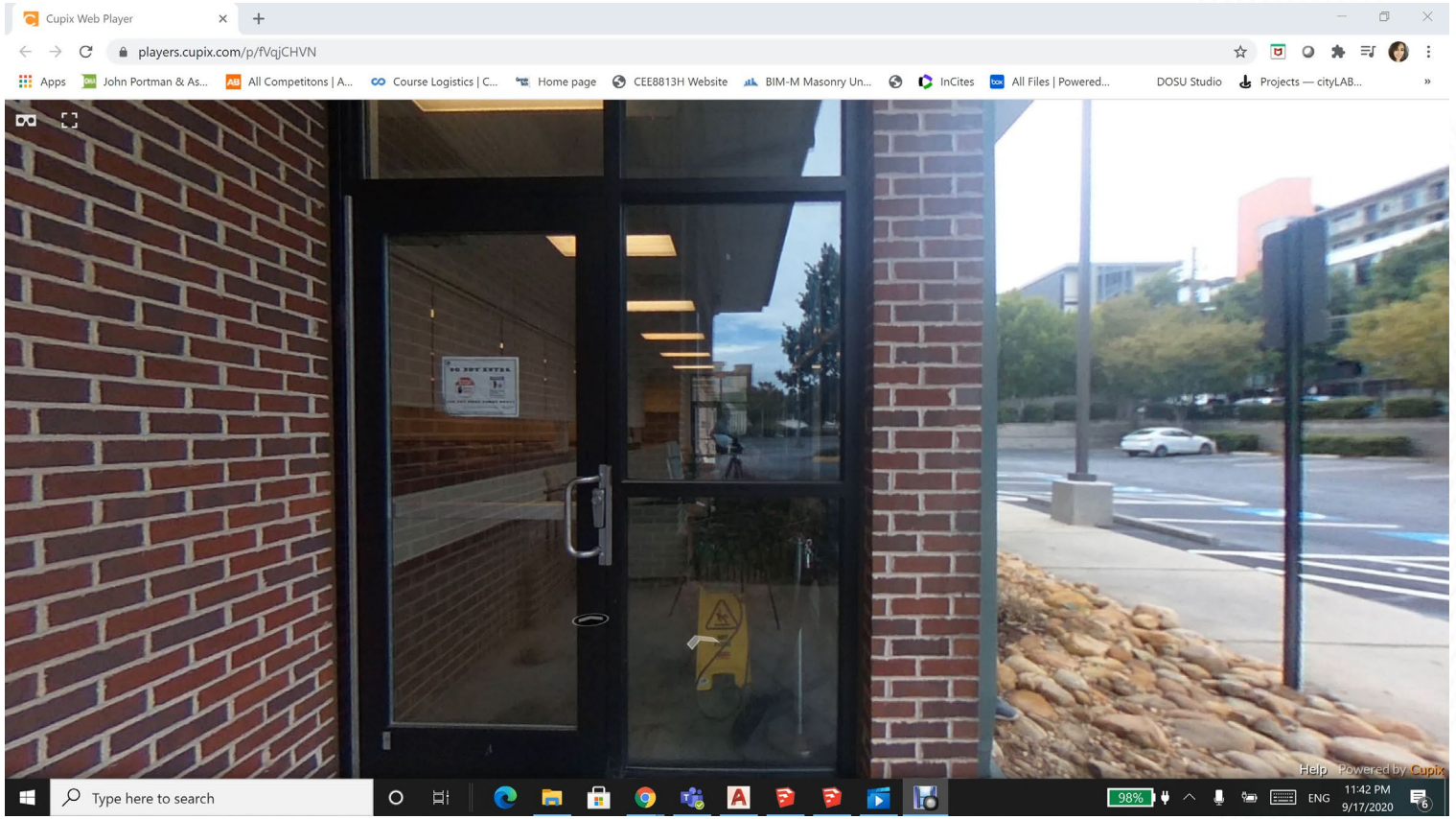
Hellen Mill 2D Drawing

[Hellen mill 3D virtual tour]

Hellen Mill Facility Study



Hellen Mill 2D Drawing



[Hellen mill 3D virtual tour]

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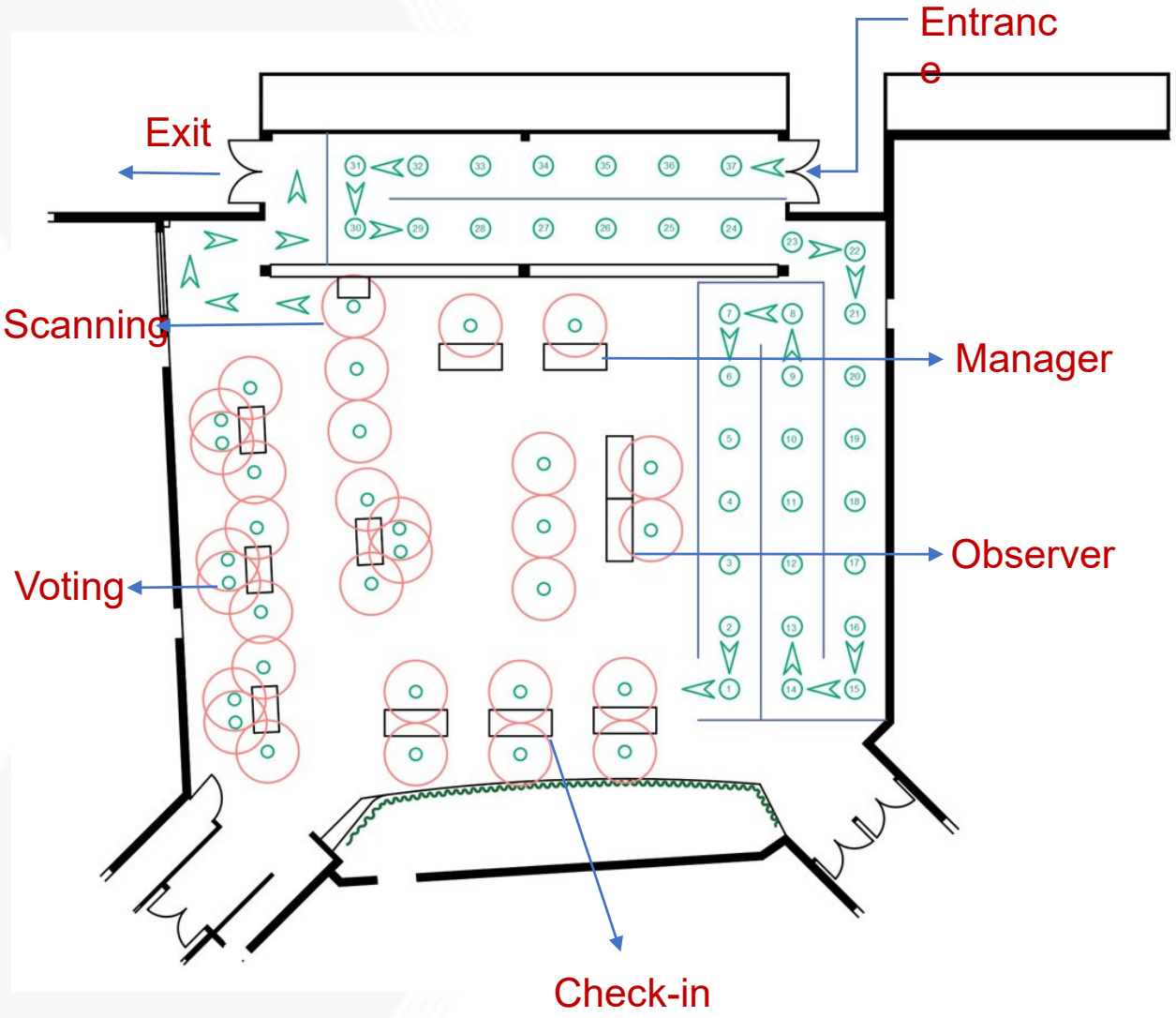
Precinct Layout with Social Distancing



Layout of Hellen facility Version 1

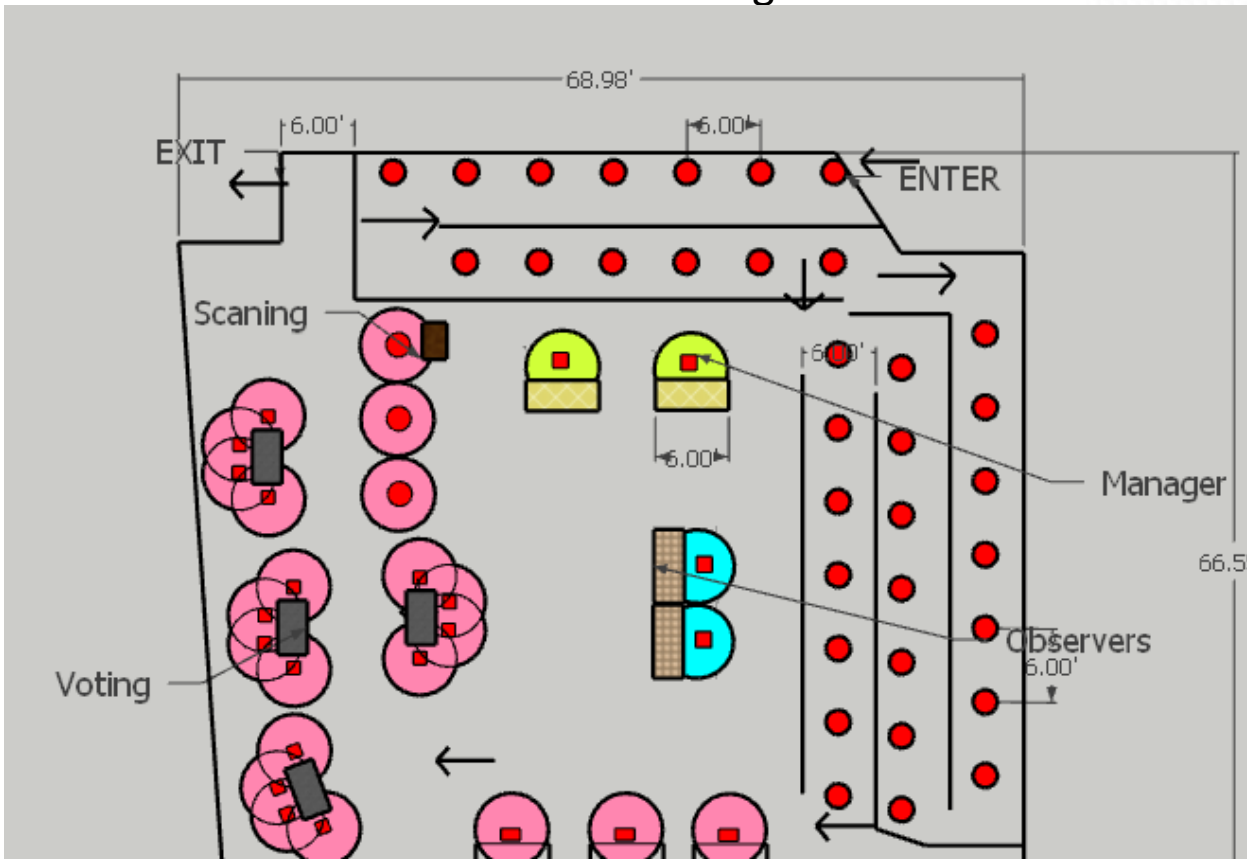
Layout Standards Recommended by Election Board:

Entrance and Exits

- the entrance and exit are at opposite ends of the voting area, to allow a one-way progression of voters through the voting area

Supervisory Staff

- table should allow effective oversight of all staff and voter



3D Tour of Hellen Mill Polling Layout

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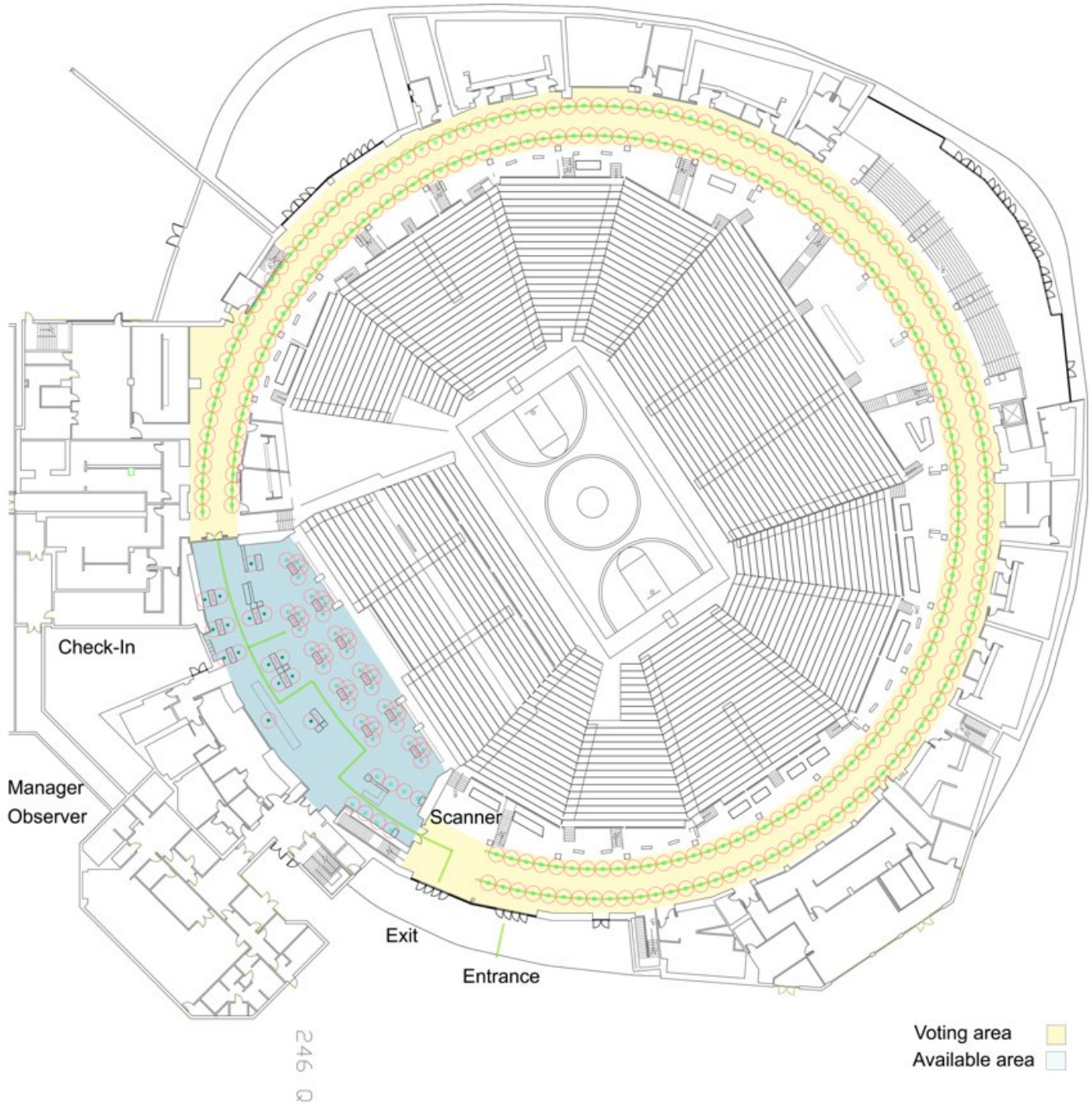

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Results to date

- 3D Covid-safe layouts of most large polling places in Fulton County
- Wait time simulations for likely scenarios
- Predictive wait time modeling
- “What-if” analysis: continuing operations when disaster occurs
- Voter-facing tools

Check-in	BMD	Scanners	Number o	Average Queue Length	Average waiting time	Maximum queue length	Maximum waiting time	Scanner Utilizati	Check-in utilizatio	Voting utilizatio
6	20	2	2354	534.4	286.8	1066	568	0.305547897	0.457328017	0.99600646
7	24	2	2432	471.2	211.6	925	404	0.360423215	0.465612151	0.981581116
4	24	2	2566	465.5	207.7	910	400	0.361822332	0.805787845	0.982734835
4	30	2	2534	271.9	100.3	555	206	0.433655671	0.959930047	0.949633293
6	40	2	2564	36.8	9.9	99	28	0.502071309	0.74899267	0.840401265
6	36	2	2541	99.6	30.1	193	59	0.734207031	0.928172817	0.8974783

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#SMARTer Together
Voter Research & Technology
October 13, 2020

Dr. Richard Barke
School of Public Policy
Georgia Tech

VIP VoterTech: 5 instructors, 30 students, 2 semesters, 1-credit course

Goals

The goal of the VoterTech team is to investigate factors that affect voter turnout among college students and develop technologies to facilitate:

- Voter registration
- Transportation to the Polls on Election Day or for Early Voting (via ride sharing)
- Early and Absentee voting
- In-person voting

Issues Involved or Addressed

- What percentage of eligible college students are registered to vote and where?
- If registered at home, what percent vote early, by absentee ballot, on election day, or not at all?
- What factors affect college students' likelihood of voting?
- What are the information needs of college students when voting?
- What are the differences in awareness between local issues (local to place of registration) and national issues? Does that difference impact desire to vote?

Academic Majors of Interest

City and Regional Planning, Computational Media, Computer Science, Human-Computer Interaction, Literature, Media, and Communication, Psychology, Public Policy

https://vote.cae.gatech.edu/

Georgia Tech Voter Guide

Home | Georgia Voting Information | Out-of-State Voting Information | Absentee Voting | Get Informed | Get Involved | About VoterTech

Search

GT Home

COVID-19 Resources

Visit our **COVID-19 Resources** page for updated information about your state's election.

Voting at McCamish Pavilion

Georgia Tech's McCamish Pavilion is an official polling location! Learn more about early voting and Election Day voting at McCamish **here**.

Excused Absence Form

Does voting on Election Day interfere with your class schedule? Request an excused absence to vote **here!**

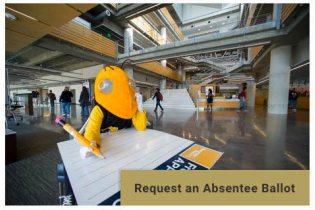
Georgia Voting Information

Out of State Voting Information

Register to Vote

Registration is the first step in ensuring your voice is heard in local, state, and federal elections.

Request an Absentee Ballot



If you cannot make it to your polling place on election day or during early voting, request an absentee ballot be delivered to your Georgia Tech mailbox, the address to which can be found at the **Georgia Tech Post Office**.

Click here to learn about the steps to absentee voting.

Election Dates and Deadlines

Find your election dates and deadlines by state:

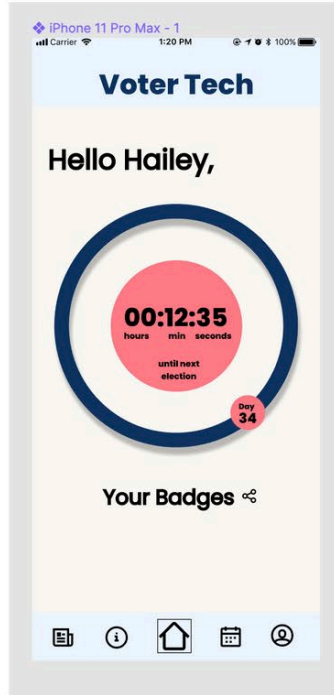
Voter Registration Deadlines

Absentee Ballot Request Deadlines

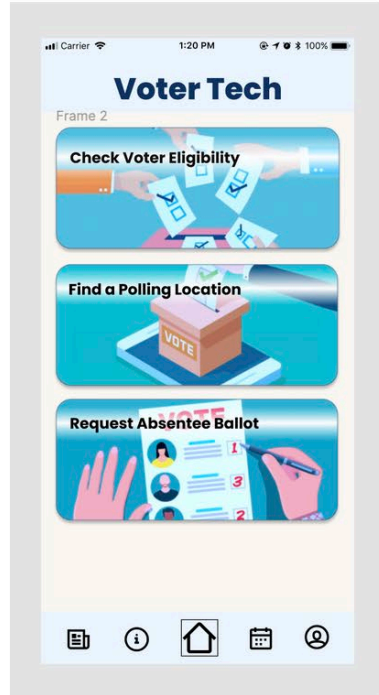
Early Voting Rules/Deadlines

Smartphone app

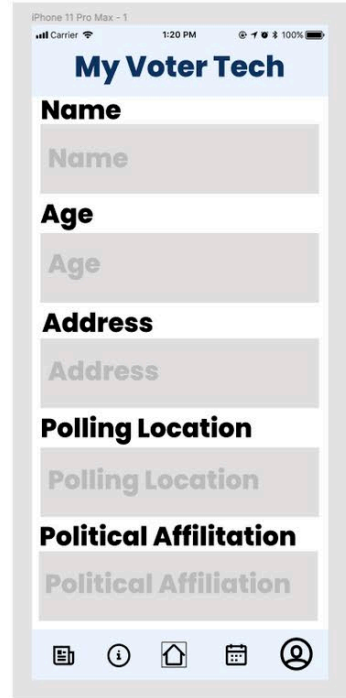
Design options



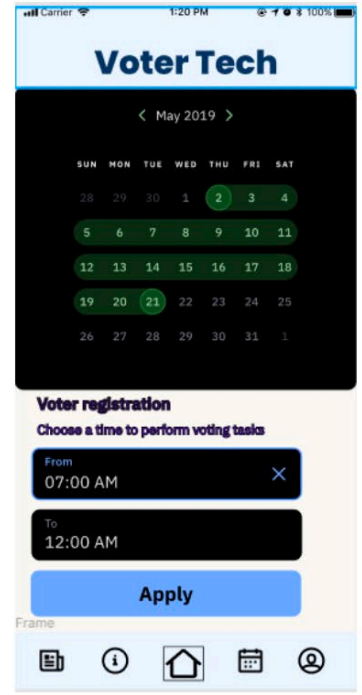
Home Screen



Information Tab

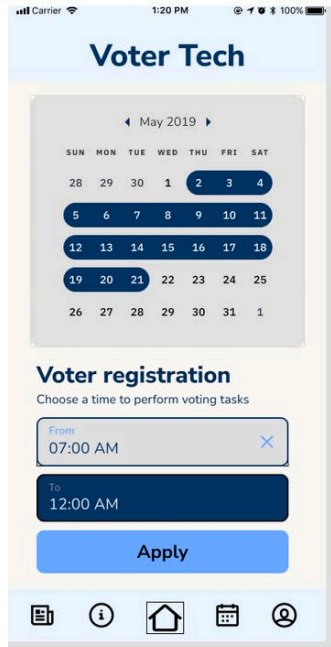


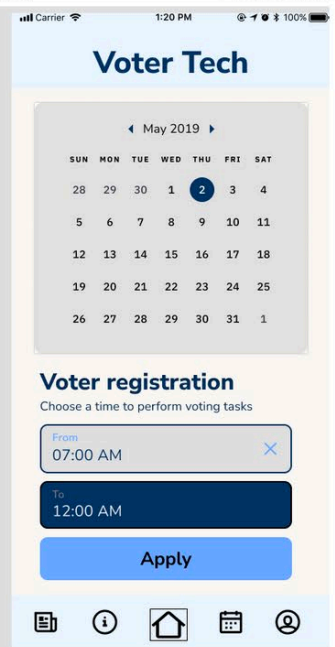
Personal Tab



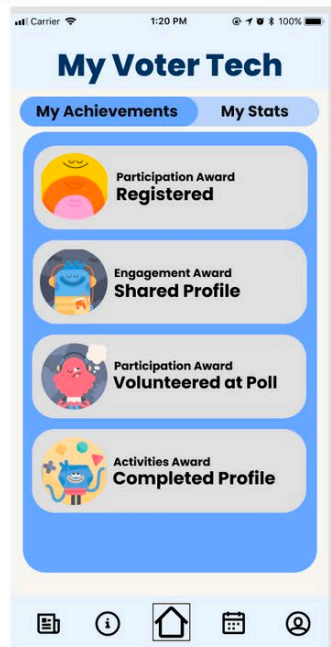
Calendar

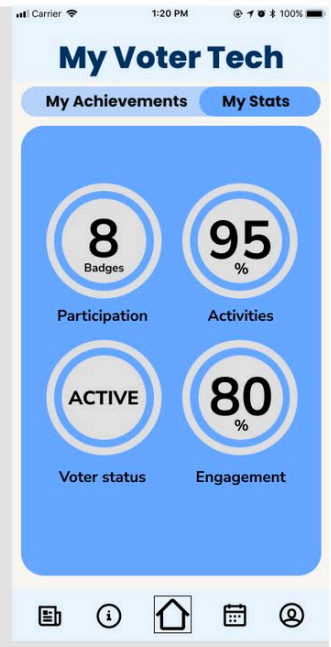
News Feed





Calendar v.2





Achievements

“Is more technology a panacea?
Or is it a Pandora’s box?”

What are the objectives?

- “democracy”: all votes, all equal
- elections: functioning
- process: perceived legitimacy

Fair, accessible, convenient, familiar
Accurate, legitimate, secure
Efficient, transparent, accountable

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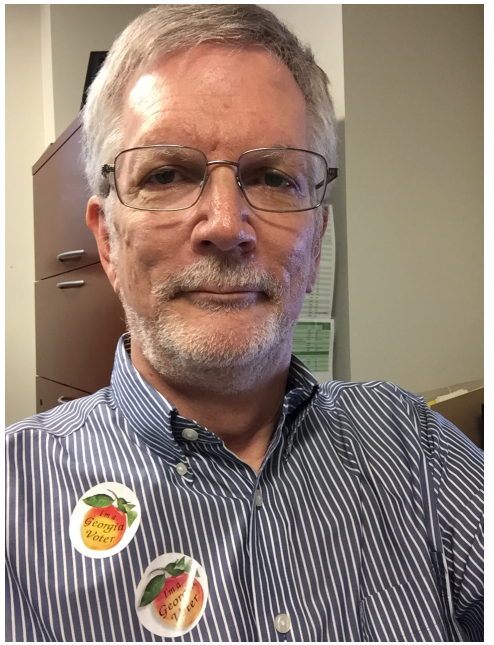

VOTING “TECHNOLOGY”

Not just engineering
Postage stamps
Human systems and processes

What is the problem?
- Reality
- Perception

Technologies operate within a complex environment moderated by social and behavioral variables.

Voting, and voting technology, occur in a difficult environment of constant change and intense partisanship, involving differing laws and political cultures, government agencies that sometimes overlap or leave gaps, voting equipment vendors, nonprofit groups, and citizen activists – and of course the media and elected officials that can have very different perspectives of the problems and solutions.

VOTING “TECHNOLOGY”

A successful public policy / technology needs to be consistent with:

- Science
- Engineering
- Economics
- Constitution
- Statutory law(s)
- Organizational capabilities
- Ethics
- Norms and traditions
- Cognitive capacities
- Politics

EXAMPLE 1: Voting Places:

100,000 in the U.S.
20,000 in California
2,300 in Georgia
404 in Fulton County
136 in Cobb County

How many systems of registration, polling places, voting rules, training, etc.?

EXAMPLE 2: Registration

1993 National Voter Registration Act
- registration at motor vehicle agencies
- mail-in
- Electronic Registration Information Center (half+ states)

Why hasn't the problem been fixed?
Should we have a national voter registration list?
Is this a purely technological problem?

EXAMPLE 2: ”Double-voting”

Most states prohibit voting more than once “in the same election.” But is voting in more than one state, but on the same day, voting in the “same election"? Or is each state-run election a separate election? What if voting occurred on different days, i.e. a voter cast an absentee ballot in one state and voted in person in another state on Election Day?

11 states explicitly prohibit voting in more than one state
7 states prohibit voting twice within the state or for the same office
31 states and Washington, D.C., prohibit voting twice in the same election

So what about a voter who voted in two states on the same federal election date?

· **If neither state prohibits “voting more than once.”** In this scenario, no crime has occurred, because *there is no federal statute prohibiting double-voting.* Voter registration in multiple states is not itself a crime, and thus no one can be prosecuted for simply having two open voter registrations in different jurisdictions.

· **At least one state prohibits “voting more than once,” but the prohibiting state does not define “voting more than once.”** Whether or not the voter violated the law varies by jurisdiction. In 2015 an Arizona woman cast an absentee ballot in Colorado and in-person in AZ. AZ Supreme Court: she did not vote "in the same election" twice because the elections were unique to each state and the AZ statute didn't apply to situations other than voting "for an office twice." AZ changed the law the next year.