Q28. Thank you for your interest in our capstone program. This form is for AU2021.
Priority deadline for these submissions is Friday, July 9.

Q1. Name of Project
Please give it a title for our tracking purposes. If a continuation project, please use same title as prior project.

Efficient Near-Optimal Voting Allocation

Q25. Company Statement of Problem of Interest

The Ohio State University

Q18. Is this a continuation of an earlier CSE Capstone project?

○ Yes

◉ No

Q2. Sponsoring organization (company name)

The Ohio State University

Q3. Main liaison/point of contact to Ohio State (name):

Name (1)	Theodore Allen
Email Address (1)	allen.515@osu.edu
Name (2 - optional)	Tian Liang
Email Address (2 - optional)	liang.1120@buckeyemail.osu.edu

Q11. Will you or another representative be able to attend team demos (2-3) at Ohio State?
NOTE: This is a required component of participating in the capstone course. (Virtual/online meetings are expected in Sp2021) Demos will have to be rescheduled if you cannot attend.

◉ yes

○ no

Q10. How much time (per week) will you be able to spend with the technical (student) team? (30 min a week is the minimum requirement)

- ○ >30 min
- ● >1 hr
- ○ >2 hrs
- ○ >3 hrs
- ○ As much as they require of me

Q5. Project Summary (may include links to outside sources)
Include why do you want to develop this product? What is the problem being solved? How do you see the product being used?

> We developed simulation optimization methods and applied them to county voting machine allocations in Ohio and New York. The key issue is long and variable ballot lengths such that having more expected voters does not, by itself, mean that more machines are appropriate. Recently, we developed a more defensible "delta-optimal" method (https://www.sciencedirect.com/science/article/pii/S0360835219307120). Unfortunately, when we try to run the method and simulations on county data, the run times are far to long. We tried coding the result in Python but that has not, by itself, sped up the run times. We need help to get defensible voting allocation software usable and available for election officials within the US and beyond.

Q9. Tell us a little bit about your company and how this product fits into the organizational goals:

> Theodore Allen is an associate professor and a member of the MIT Election Science Laboratory. He is a certified expert witness in US federal courts. Providing useful software could really change how the US votes and help other countries as well. It is likely not a fundable topic but it is an important one.

Q17.
What are the top 2-3 major objectives you expect to be accomplished this semester?

> User cases are shown in the alpha version of the too slow excel software (http://www.blying.com/sitebuildercontent/sitebuilderfiles/voteizgbs.alphav9faster.xlsm). We want to support allocation (fixed resources deployed at locations) and also apportionment (asking the state and others for resources).

Q15. You will be given all code, tests, and documentation developed by the team. Describe any other special deliverables that you would like to see:

> We need both code and test problems that can be run quickly to both validate the methods and assure usability. Performing usability testing is also desirable resulting in a report. Benchmarking with other available software could be helpful.

Q19.
What do you expect will be the biggest challenges to completing the objectives of this project by end of semester (12 weeks)?

Making short run times with a good usable interface is not easy. We may need to try queuing methods instead of simulation if the problem is too hard.

Q13. Do you have a preference on platform?

	Strong preference	Slight Preference	No Preference	N/A
Desktop/laptop	○	○	○	○
Web based tool	◉	○	○	○
Mobile app: Android	○	○	○	○
Mobile app: iPhone	○	○	○	○
Database solution	○	○	○	○
Other:	○	○	○	○

Q14. Do you have a preference for language used?

Python

Q16.
Are there any special tools or environment of which the technical team should be aware?

Many officials like excel. There are technical issues associated with the size of the county and what it means to guarantee all voters are expected to wait less than 30, 60, or 80 minutes.

Q26. Capstone project fees range in priced depending on several factors such as IP ownership, size of company, non-profit status, etc. Please select those that pertain to you:

- ☐ Start up or small business
- ☑ Not for profit status
- ☐ "pet project" - no organization/business
- ☐ Open source project
- ☑ University-affiliated organizatoin
- ☐ Part of a larger grant or sponsored project
- ☐ Multi-term project (You already expect this to last 2 or more semesters)

Q21.
What percentage of the product work will be bug repairs and maintenance? (versus the rest will be new development)

This question was not displayed to the respondent.

Q22.
Do you have any existing artifacts (software code, tests, documents, etc.) that the technical team can use to get started?

This question was not displayed to the respondent.

Q26. End of application. Click the next button to submit or back button to make changes.

Location Data

Location: (40.245895385742, -83.360298156738)

Source: GeoIP Estimation