

Gerrymandering Problems and Solutions in Minnesota

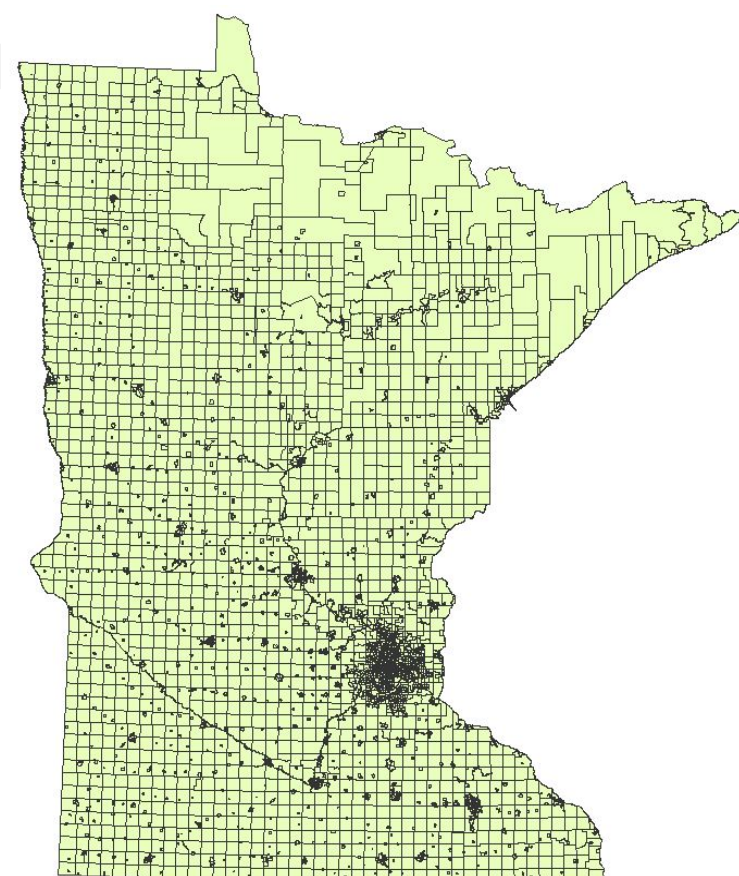
Hayden Little and Liza Murdoch

Motivation and Goals

- Gerrymandering is the act of politicians manipulating the redrawing of voting districts for political benefit.
- We wanted to use AI principles to both emulate gerrymandering and draw fair districts.

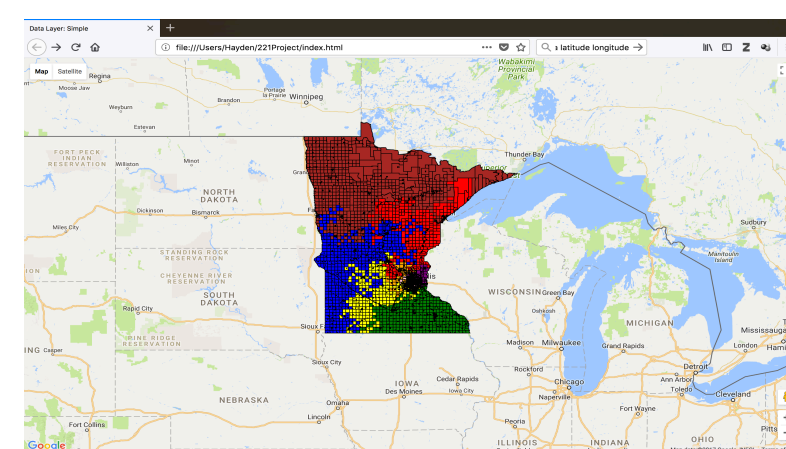
Model

- Minnesota is separated into 4,120 voting precincts and 8 Congressional districts.
- A search problem with an evolving set of heuristics tailored to the goal at hand.



Future Work – Web Application

- We want to develop a fully functioning web application that allows the user to visualize the search algorithm with editable heuristics.



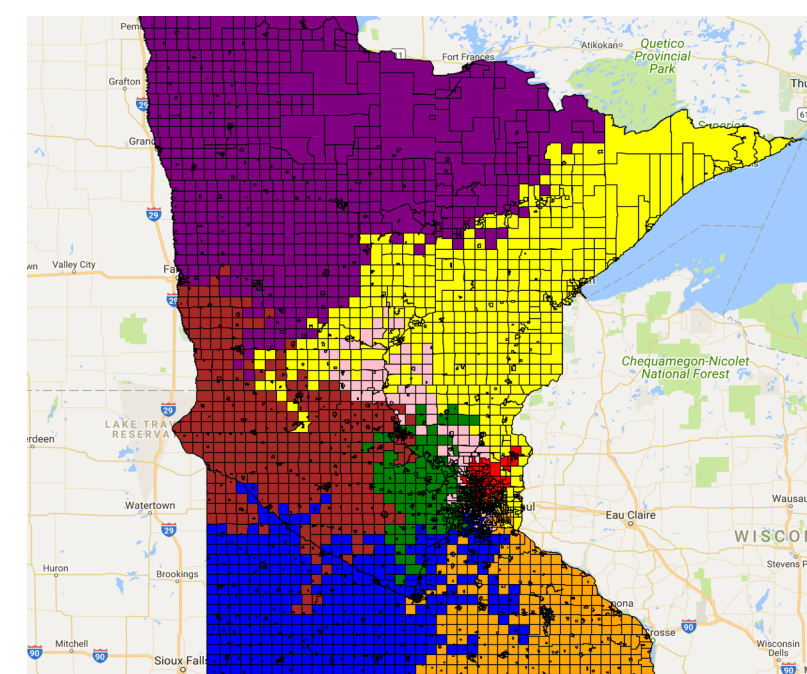
Status:

- All geospatial data generated can be displayed in web browsers.

Methods

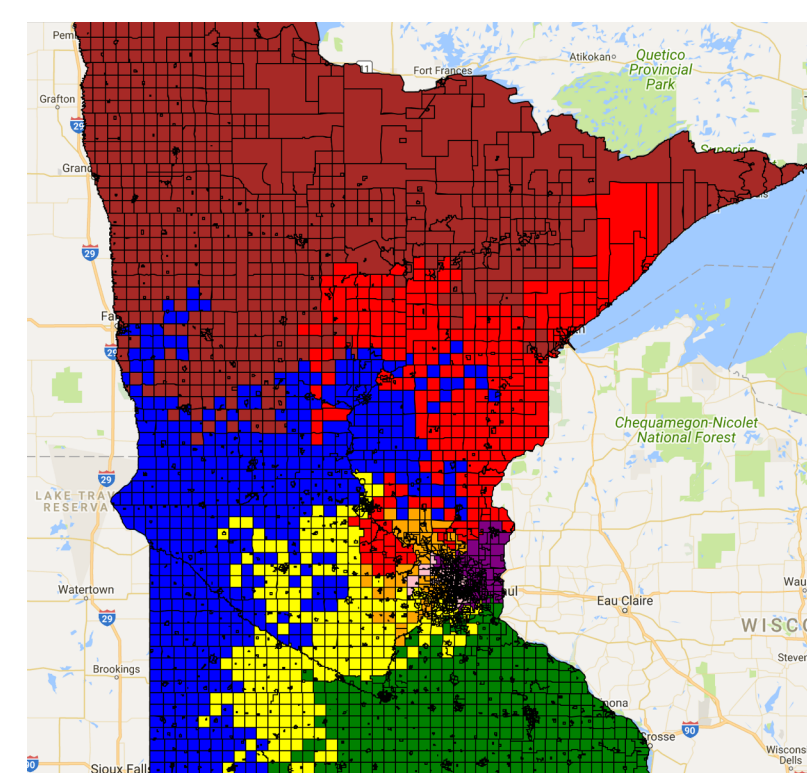
- Repeat the search T times, taking note of whether this assignment of precincts to Congressional districts is the best one that has been seen so far.
- Randomly assign 8 different precincts to be the first to belong to each of the Congressional districts.
- Take an action based on a heuristic (e.g. add the precinct with the largest number of Republican voters to the district with the lowest number of Republican voters).

Results



MN-1	D+15
MN-2	R+5
MN-3	R+3
MN-4	R+1
MN-5	R+11
MN-6	D+15
MN-7	R+15
MN-8	R+2

Although Republicans only made up 45.4% of the Minnesota statewide vote in 2016, intelligent boundary drawing distributes that vote to win them 6 districts (75% of the representation)



MN-1	R+7
MN-2	R+15
MN-3	D+4
MN-4	D+10
MN-5	R+2
MN-6	D+2
MN-7	R+8
MN-8	D+14

When optimizing for nonpartisanship, we get 4 districts that are Democratic and 4 that are Republican, equal representation of both sides.