algorithmic redistricting and black representation

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redistricting is the process of drawing geographic regions for electoral purposes. the united states has a **history of abusing redistricting** to limit social, racial, ethnic, and political groups' power

many have proposed "neutral" **algorithmic** tools to perform this task which draw nicely shaped districts subject to constraints like being connected and having equal population

proponents argue that because the algorithm doesn't take in racial, ethnic, political, economic, etc. data it **cannot be biased** in favor of or against any group

opportunity districts are districts that provide the **opportunity** for a community, which **votes cohesively**, to elect **their candidate of choice**

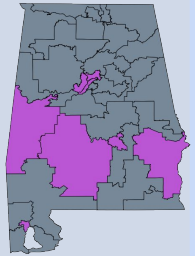
we compare four algorithmically-drawn state senate plans in alabama and michigan. **all four** have fewer **black opportunity districts** than the enacted plans and fewer than would be expected using a proportionality standard

preprint & poster available online

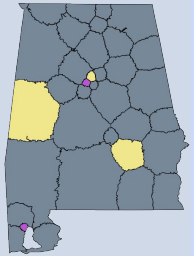
tinyurl.com/algo-black-rep

alabama
27% black; 35 districts
both rural & urban
black pop.
racially polarized vote

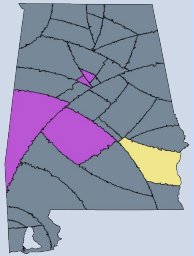
purple districts are "clear" opp. dists.
yellow districts are "marginal" opp. dists.



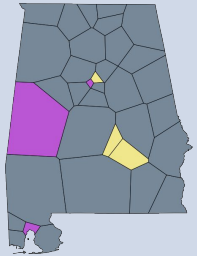
8 0
enacted
5 0



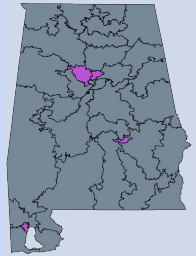
2 3
annealing
3 1



4 1
arcs
2 2

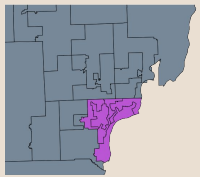


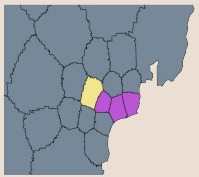
3 3
voronoi
3 3

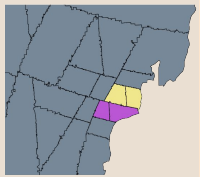


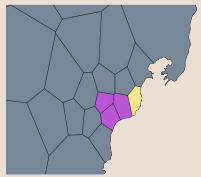
4 0
tree
4 0

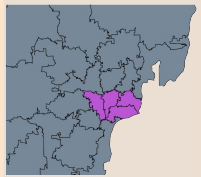
michigan
14% black; 38 districts
black pop., mainly in
detroit (shown)
very racially polarized
vote











the algorithmic plans have a **few districts** where black voters have **lots of influence** and **many others** where their strength is **diluted**

enacted by state legs., used in recent elections

iteratively assign blocks to improve compactness

brian olson '09

recursively partition the state with circular arcs

levin & friedler '19

find a balanced voronoi-like partition

cohen-addad, klein, young '18

recursively draw and clip spanning trees

gerrychain '18