algorithmic redistricting and black representation

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preprint & poster available online

tinyurl.com/algo-black-rep

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

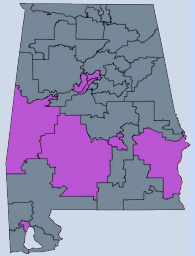
many have proposed "neutral" **algorithmic** tools to perform this task which draw nicely shaped districts subject to constraints like being connected and having equal population

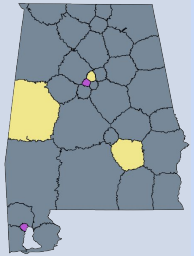
proponents argue that because the algorithm doesn't take in racial, ethnic, political, economic, etc. data it **cannot be biased** in favor of or against any group

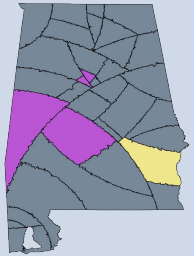
opportunity districts are districts that provide the **opportunity** for a community, which **votes cohesively**, to elect **their candidate of choice**

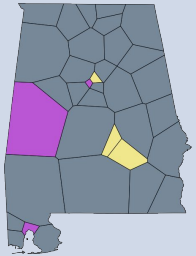
we compare four algorithmically-drawn state senate plans in alabama and michigan. **all four** have fewer **black opportunity districts** than the enacted plans and fewer than would be expected using a proportionality standard

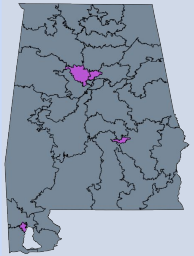
alabama
27% black; 35 districts
both rural & urban black pop.
racially polarized vote







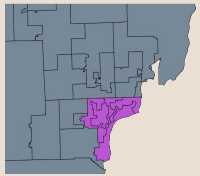


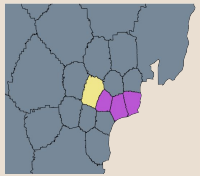


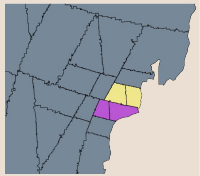
purple districts are "clear" opp. dists.
yellow districts are "marginal" opp. dists.

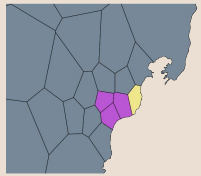
enacted	annealing	arcs	voronoi	tree
8 0	2 3	4 1	3 3	4 0
5 0	3 1	2 2	3 3	4 0

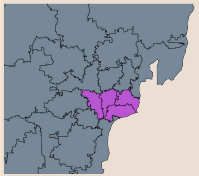
michigan
14% black; 38 districts
black pop., mainly in detroit (shown)
very racially polarized vote











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

enacted	annealing	arcs	voronoi	tree
enacted by state legs., used in recent elections	iteratively assign blocks to improve compactness	recursively partition the state with circular arcs	find a balanced voronoi-like partition	recursively draw and clip spanning trees
	brian olson '09	levin & friedler '19	cohen-addad, klein, young '18	gerrychain '18