

GEOGRAPHY MEETS
GEOMETRY
IN REDISTRICTING

Moon Duchin

- **Segregation** and **compactness**
- Intertwining of theory (metrics), technology, and human outcomes - sometimes perversely
- Role of demonstration plans as benchmarks
- “Method of ensembles”

COMPACTNESS

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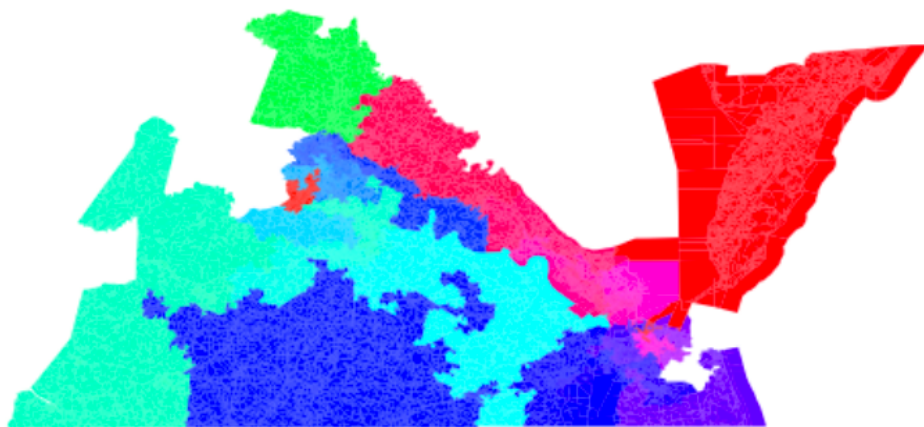
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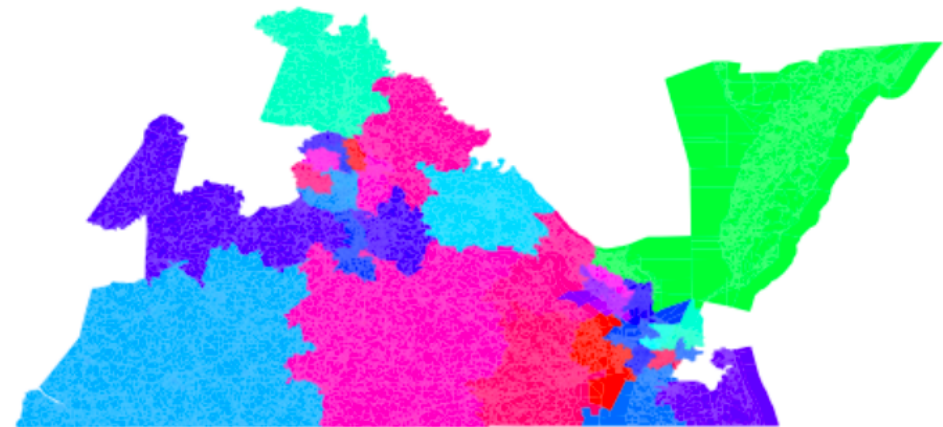
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(a) Plan with 11,996 cut edges



(b) Plan with 5,702 cut edges

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- Segregation in practice: Chicago project – districtr.org/chicago

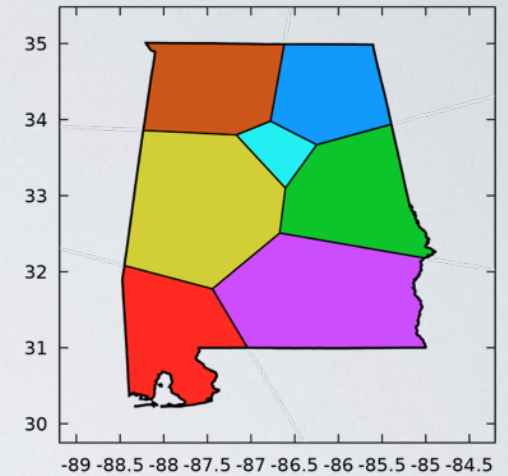
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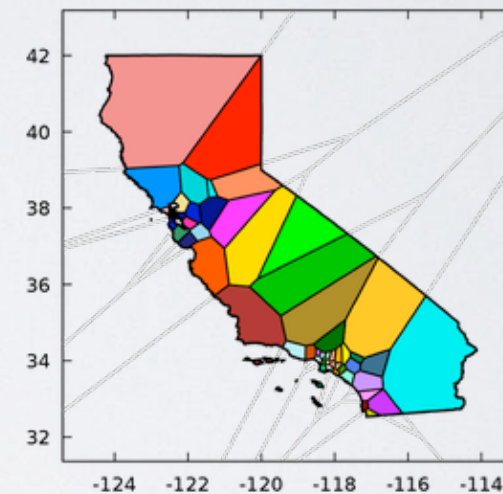
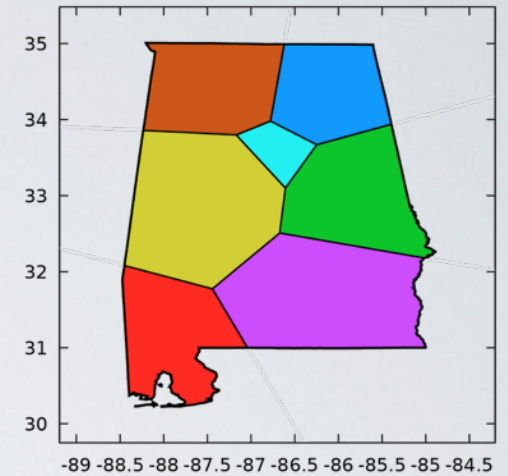
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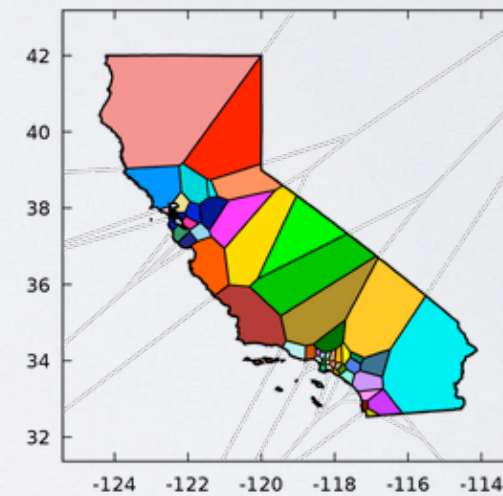
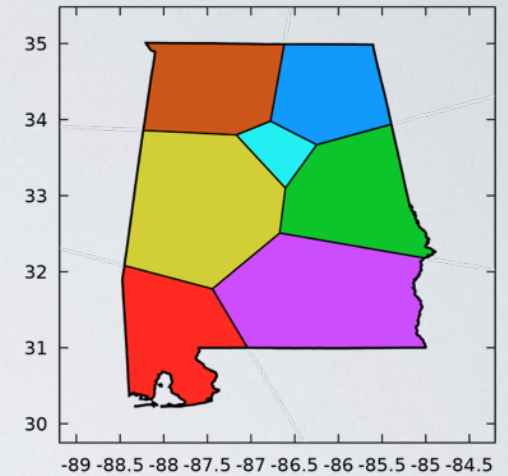
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A



B



C

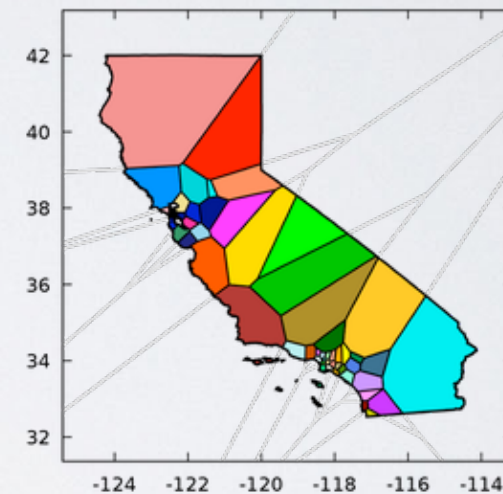
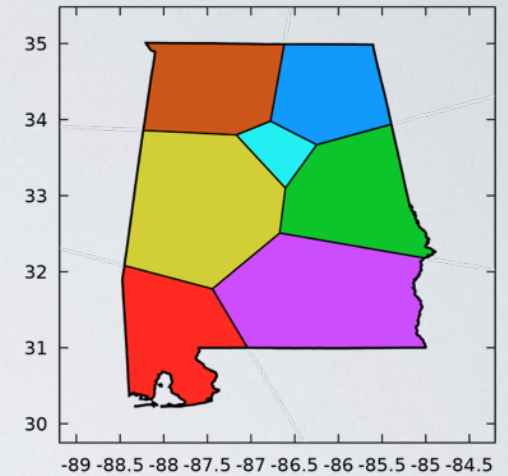


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B



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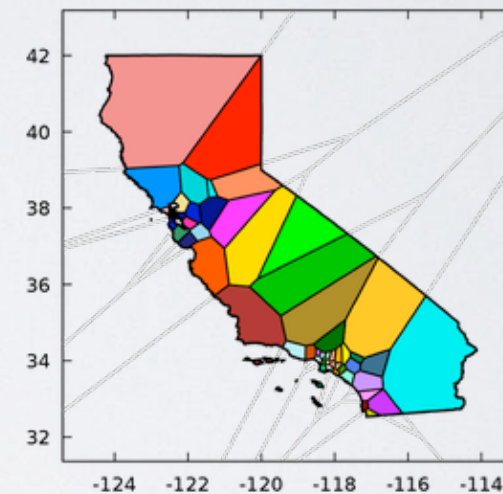
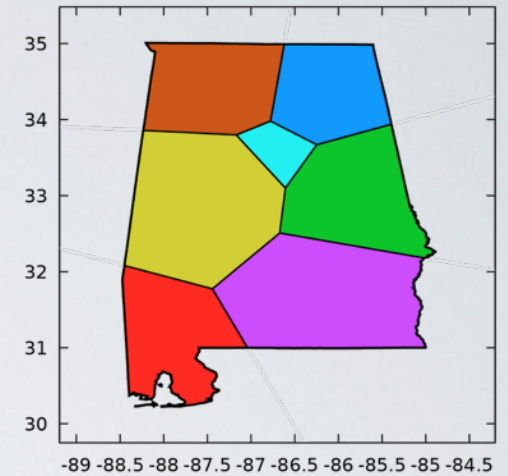


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- Markov chain Monte Carlo (MCMC) gives you ways to sample *representatively* from the universe of plans - does a plan behave as though chosen only from the stated rules?



A



B

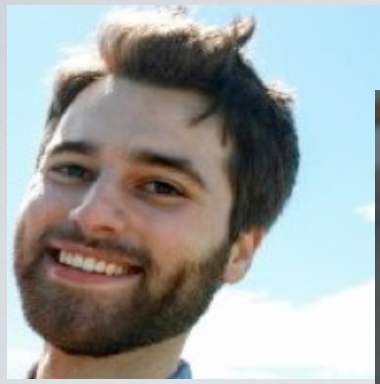


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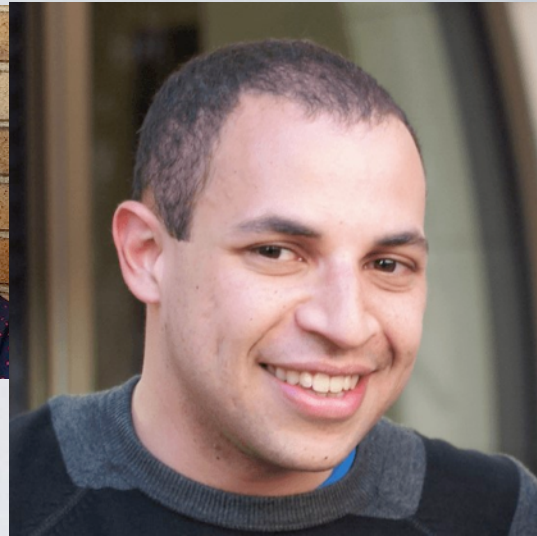


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- The redistricting problem is aggressively interdisciplinary - must forge collaborations of geographers, political scientists, urban sociologists, legal and political theorists, litigators, mathematicians and computer scientists, developers, ...

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