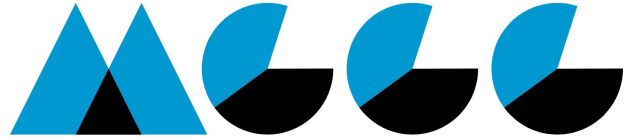


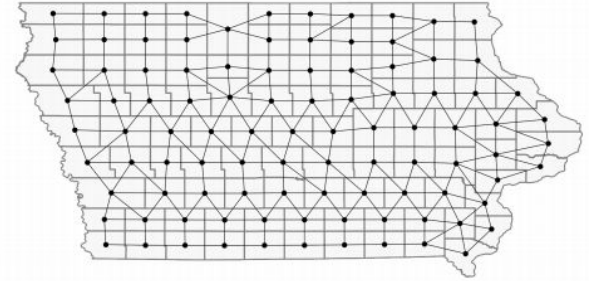
GerryChain

Some recent developments

What is GerryChain?

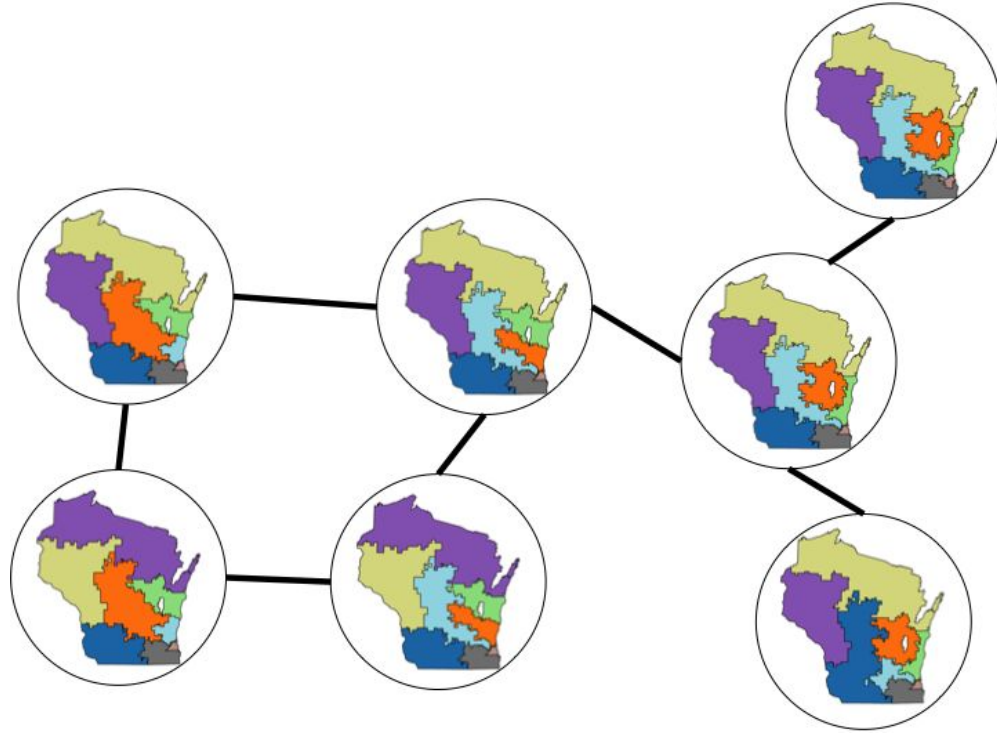


- A user-friendly Python library for ensemble analysis.
- Turns shapefiles into dual graphs with data.
- Implements Markov chains for generating large ensembles of plans.
- Computes statistics for districting plans (e.g. compactness, vote shares).



What is ReCom?

- ReCom stands for “recombination.”
- It is a way of transforming plans by merging two districts at a time and finding a new way to split them.
- It is an alternative to a simple Flip walk, which changes one unit at a time (precinct, census block, etc) to a new assignment.



ReCom gets a paper

Recombination:

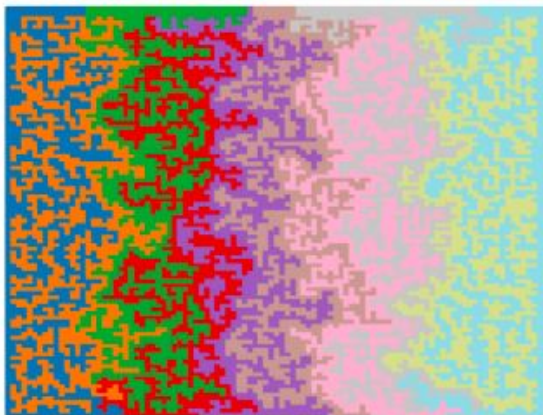
A family of Markov chains for redistricting

Daryl DeFord, Moon Duchin, and Justin Solomon*

November 14, 2019



(a) Initial Partition



(b) 1,000,000 Flip steps

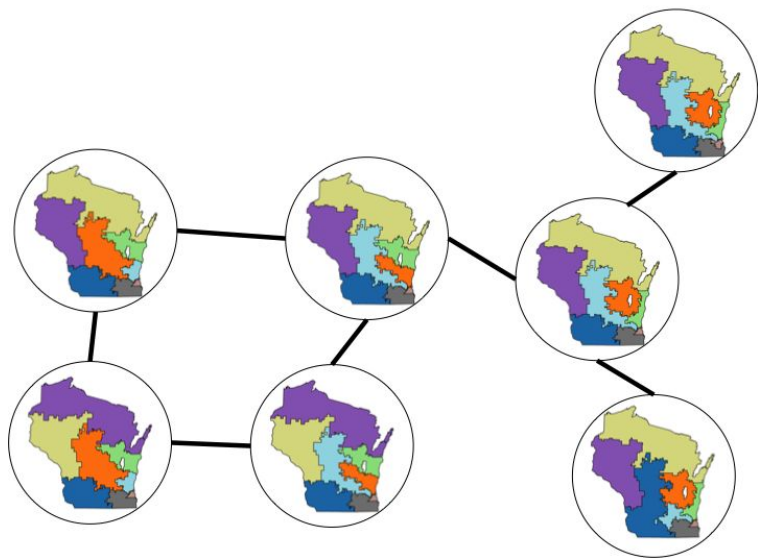


(c) 100 ReCom steps

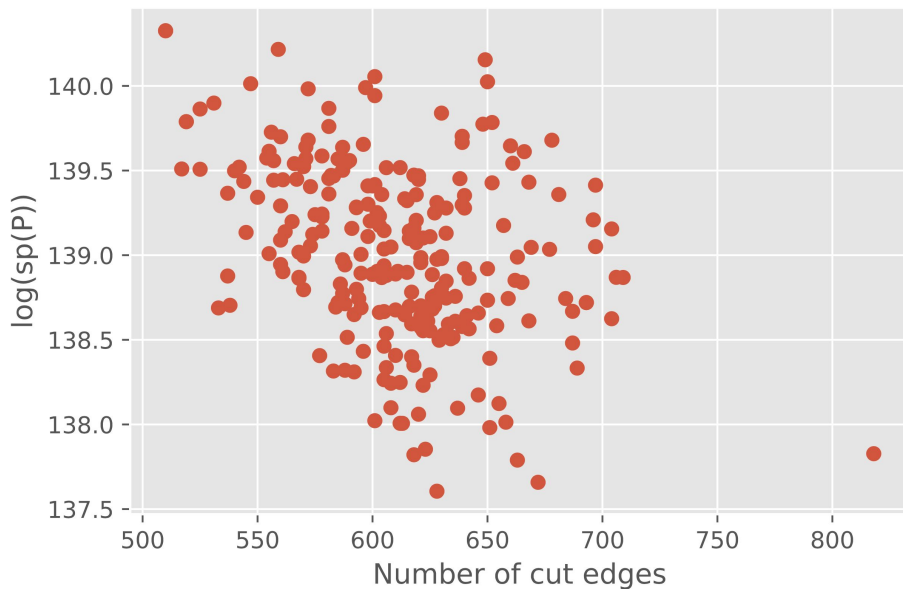
ReCom goes reversible

$$w_i P_{ij} = w_j P_{ji} \quad \forall i, j.$$

A new version of the ReCom algorithm (Cannon–Duchin–Randall–Rule, preprint available if you ask nice) has better mathematical properties which allow rigorous sampling from target distributions.



VA cut edge count vs. spanning tree count
2012 enacted seed, RNG 1, reversible, interval 1



ReCom goes supersonic

GerryChain's computational heart is being ported to Julia, and it's lightning fast.

