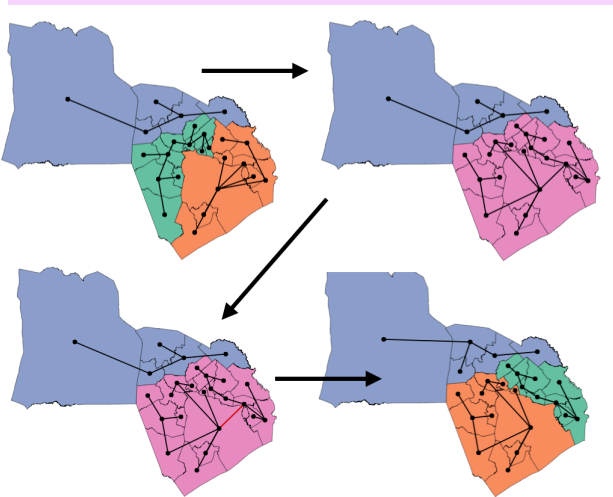


# Uncovering Gerrymandering: Revealing Geopolitical Structure through Sampling

**DR. GREGORY J. HERSCHLAG (DUKE UNIVERSITY)**

Gerrymandering is the process of nefariously manipulating how we are represented. Its practice may serve to either amplify the power of a political group or suppress the power of certain peoples. Although we have seen increasingly precise and effective gerrymanders, a number of mathematicians, political scientists, and lawyers are developing effective methodologies at uncovering and understanding the intent and effects of gerrymandered districts.

The basic idea behind these methods is to compare a given set of districts to a large collection of neutrally drawn plans. The process relies on three distinct components: First, we decide what a compliant or legal redistricting plan is; next, we sample the space of compliant redistricting plans, generating a large collection of non-partisan alternatives; finally, we compare the collection of plans to a particular plan of interest. The first step, though largely a legal question of compliance, provides interesting grounds for mathematical translation; the second and third points create rich problems in the fields of applied mathematics (sampling theory) and data analysis, respectively.



In this talk, I will discuss how our research group at Duke has analyzed gerrymandering and successfully communicated our findings through expert testimony. I will also discuss the sampling methods used to build large collections of plans and discuss several algorithmic advances. These sampling methods provide rich grounds both for mathematical exploration and development and also as a practical and relevant algorithm.

**Friday, March 12, 2021**

**2-3p.m. PDT**

**Zoom Meeting ID: 823 8550 9211**

**Zoom Passcode: CSUSB\_Math**