



MSCS TLC LECTURE
MONDAY MARCH 13
3:30 PM, RNS 310

Guest Speaker: Michael Orrison

Voting and Linear Algebra: Connections and Questions

Abstract: Voting is something we do in a variety of settings and in a variety of ways, but it can often be difficult to see

Tally Map: $T_w : \mathbb{R}^6 \rightarrow \mathbb{R}^3$

$$T_w(\mathbf{p}) = \begin{bmatrix} 1 & 1 & s & 0 & s & 0 \\ s & 0 & 1 & 1 & 0 & s \\ 0 & s & 0 & s & 1 & 1 \end{bmatrix} \begin{bmatrix} 2 \\ 3 \\ 0 \\ 4 \\ 0 \\ 2 \end{bmatrix} \begin{matrix} \text{ABC} \\ \text{ACB} \\ \text{BAC} \\ \text{BCA} \\ \text{CAB} \\ \text{CBA} \end{matrix} = \begin{bmatrix} 5 \\ 4 + 4s \\ 2 + 7s \end{bmatrix} \begin{matrix} \text{A} \\ \text{B} \\ \text{C} \end{matrix}$$

nontrivial relationships between the different voting procedures we use. In this talk, I will discuss how simple ideas from linear algebra and discrete mathematics can sometimes be used to unify different voting procedures, and how doing so leads to new insights and new questions in voting theory.



Bio: Michael Orrison is a Professor of Mathematics at Harvey Mudd College. He received his A.B. from Wabash College in 1995, and his Ph.D. from Dartmouth College in 2001. His teaching interests include linear algebra, abstract algebra, discrete mathematics, and representation theory. His research interests include voting theory and harmonic analysis on finite groups. He particularly enjoys finding, exploring, and describing novel applications of the representation theory of finite groups with the help of his talented and energetic undergraduate research students.