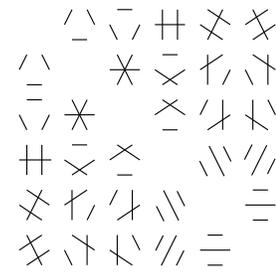# Mathematics Seminar

Rocky Mountain Algebraic Combinatorics Seminar

Towards a common Tensor

James Wilson
Colorado State University

Algebraist, geometers, physicist and engineers can't seem to talk the same way about tensors. Lets try to to bridge the differences.

DETECTING CLUSTER PATTERNS IN TENSOR DATA USING LIE THEORY

James Wilson
Colorado State University

I'll introduce a class of efficiently computable cluster patterns for tensor data. The class includes familiar patterns such as block- diagonal decompositions explored in statistics and signal processing, Tucker decompositions, and low-rank tensor decompositions. It also includes a new family of cluster patterns—not known to be detectable by cur- rent methods—that can be thought of as continuous decompositions approximating curves and surfaces. Using elementary Lie Theory we present a general algorithm to detect cluster patterns in the class using a parameter we call a chisel to tune the search to patterns of a prescribed shape. We also show that the patterns output by the algorithm have desirable uniqueness properties. An implementation of the algorithm in the Julia system is publicly available.

Weber 223
4–6 pm, Friday, February 14, 2024
Colorado State University
4 pm, Friday, February 14, 2024

This is a joint Denver U / CU Boulder / U of Wyoming / CSU seminar that meets biweekly.
Anyone interested is welcome to join us at a local restaurant for dinner after the talks.