1 Saturday morning 11:01–12:10, Session A, BLOC 160

11:00–11:20 **Yujun Yang**, Texas A&M University–Galveston
*A recursion formula for resistance distances and its applications.*
Intrinsic metrics on a graph \( G \) have become of interest. Amongst these metrics are the common shortest-path metric, and also the “resistance distance”, for which there are different equivalent definitions including that this distance is the net effective resistance between any two vertices when unit resistors are associated to each edge of \( G \). And this net resistance is still a metric when there are different positive weights for the edges. In this guise the resistance distance have long been studied, as a part of electrical circuit theory, dating back to Kirchhoff and Maxwell, and extending on to modern electrical engineering. In this talk, a recursion formula for resistance distances is obtained, and some of its applications are illustrated.

11:25–11:45 **David Amos**, Texas A&M University
*Upper bounds for the \( k \)-forcing number of a graph*
The zero forcing number of a graph $G$ is a lower bound for the minimum rank of a graph. I will discuss a generalization of the zero forcing number – called the $k$-forcing number and denoted $F_k(G)$, some upper bounds for $F_k(G)$, and its relation to the connected domination number.

11:50–12:10 **Douglas Klein**, Texas A&M University–Galveston

*Stellated Graphs*

A graph is simply stellated by subdivision of edges followed by taking the line graph. Such a stellation then has twice the number of vertices of the original graph. Various modest decorations of this arise in different contexts, and are indicated.

## 2 Saturday morning 11:01–12:10, Session B, BLOC 161

11:00–11:20 **Mitch Phillipson**, Texas A&M University

*Fillings of Layer Polyominoes.*

In this talk we will give two simple bijections on fillings of layer polyominoes. First, over unrestricted fillings, the number that do not contain a ne-chain is the same as the number that do not contain an se-chain. Second, over restricted fillings, the joint distribution (ne,se) is symmetric.

11:25–11:45 **Jerry Hu**, University of Houston–Victoria

*The probability that algebraic integers are $k$-wise relatively prime.*

We will discuss how to compute the probability that algebraic integers are $k$-wise relatively prime. The conjectural analogues of $k$-wise primality for algebraic varieties over finite fields and schemes over integers will also be discussed.

11:50–12:10 **Art Duval**, University of Texas-El Paso

*Weighted spanning enumerators of color-shifted simplicial complexes.*

Weighted spanning enumerators of color-shifted simplicial complexes Abstract: We find a factorization of a weighted enumeration of top-dimensional spanning trees of color-shifted simplicial complexes on $r = 3$ colors, and we conjecture our result and technique will extend to all $r$. (Ehrenborg and van Willigenburg solved $r = 2$.) This is joint work with Ghodratollah Aalipour.

## 3 Saturday afternoon, 4:30–5:40, Session A, BLOC 160

4:30–4:50 **Dong Ye**, Middle Tennessee State University

*Nowhere-zero 3-flows in signed graphs*

A signed graph $(G; \sigma)$ is a graph $G$ associated with a signature $\sigma : E(G) \to \{-1, +1\}$. Bouchet’s conjectured that every sign-bridgeless graph admits a nowhere-zero 6-flow. In this talk, I will present recent developments on integer flows in signed graphs, especially nowhere 3-flows.
4:55–5:15 **Aras Erzurumluoglu**, Auburn University
*Vertex-equalized k-edge-colorings.*
Vertex-equalized k-edge-coloring is a new type of edge-coloring where it is required that the number of vertices in the k subgraphs induced by the edges of each of the k colors are within one of each other. In this work, existence of such colorings is settled for k=2 and k=3, for connected graphs.

5:20–5:40 **Rupei Xu**, University of Texas–Dalla.
*Design of Asymmetric Sparse Connectors*
In a multicast communication network, senders communicate with multiple receivers to send identical data. In such communication networks, each node can be a computer or a service machine which can receive, copy, and send packets of data. Multicast traffic means that several nodes have a simultaneous demand to receive a copy of a single packet. How to make the communication efficient? The topology structures of the network play an important role. In this paper, the asymmetric sparse connector design problem is considered, in which, n input nodes connect to N output nodes via intermediate vertices to form vertex disjoint paths, with as less edges as possible, where n << N. An efficient algorithm is given.

4 Saturday afternoon, 4:30–5:40, Session B, BLOC 161

4:30–4:50 **Lauren Keough**, University of Nebraska-Lincoln
*Extremal Questions for Matchings*
We are interested in finding which graphs on n vertices and e edges have the minimum number of matchings. A graph with the fewest matchings can be found among the threshold graphs. In the bipartite graph case we find that the lex bipartite graph attains the minimum number of matchings of every size. In the general graph case, we show that the lex or colex graph attains the minimum number of matchings.

4:55–5:15 **Luis David Garcia-Puente**, Sam Houston State University
*Identifiability of structural equation models*
Structural equation models (SEMs) are statistical models on a graph with directed and bidirected edges. A central problem in SEMs is the analysis of parameter identification. Here, we detail a computational experiment to find all the algebraically d-identified SEMs on at most six random variables.

5:20–5:40 **Franklin Kenter**, Rice University
*Discrepancy Inequalities for Directed Graphs*
We introduce skew-discrepancy, a type of discrepancy specific to directed graphs. This discrepancy measures how ”directed” the graph is when considering large sets of vertices. We show the skew-discrepancy is tightly controlled by an eigenvalue of a skew-symmetric matrix within a logarithmic factor.

*Toward the enumeration of maximal chains in the Tamari lattice*
Approximately 50 years ago Dov Tamari introduced his poset and shortly after proved the lattice property. The lattice is a Catalan set of elements with ordering based on the associative law. To date a formula for the number of maximal chains is still unknown. Quoting Knuth, "The number of such paths remains mysterious." We discuss some current results pertaining to this enumeration.