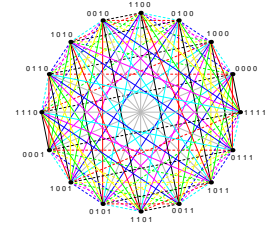


**Jointly Organized by**  
**School of Computer Science and**  
**Department of Mathematics and Statistics**



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April 8 (Monday), 16:30 – 17:30, Burnside Hall 1205

**Reaching toward the limits of exhaustive search**

by

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Exhaustive search or complete listing is to generate all objects satisfying a prescribed property. The listing of all non-isomorphic graphs of a fixed number of vertices is a well known example. Computationally efficient listing demands both mathematically sound ideas and clever computational techniques. In this talk, we travel through a few recent examples of exhaustive search that were not possible before, and present critical mathematical and computational ideas. In particular, the problem of constructing an arrangement of hyperplanes and that of listing all combinatorial types of point configurations in the  $d$ -dimensional real space will be discussed. We will see how the combinatorial abstraction of hyperplane arrangements and point configurations by oriented matroids becomes useful in solving the latter listing problem.