

## Grady Gives Talk at INFORMS Computing Society Meeting

Stephen Grady gave a talk on emergent tools for solving the dominating set problem on finite, simple, undirected graphs. Given such as graph  $G=\langle V,E\rangle$ , a dominating set  $D$  is a subset of  $V$  such that every vertex not in  $D$  is adjacent to at least one member of  $D$ . Deciding dominating set is *NP*-complete, with applications ranging from facilities location to network analysis to computational biology. He discussed ongoing comparisons between direct graph algorithms and mathematical programming techniques, and identified topological graph invariants that help tip the scales in favor of one methodology over another. Grady also described mixing strategies in the pursuit of ever more efficient algorithms. For instance, he found that the use of graph theoretic reduction rules combined with lower bounds provided by linear programming offer a promising avenue for future research. This work helps lay a basis for further studies in classifying vertices based on their solution counts, which can in turn be a powerful tool for determining network controllability.



Slides can be found at <http://web.eecs.utk.edu/~sgrady3/powerpoint/INFORMS-talk.pdf>.

The 2019 INFORMS Conference was held in January, 2019, at the Knoxville Convention Center, located close to the University of Tennessee's main campus in Knoxville, Tennessee. It focused on the interface between computer science, machine learning, operations research and management science.