

Coloring Intersection Points of Line Segments

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Abstract

We study the minimum number of colors with which the intersection points of a set of line segments can be colored so that no segment contains points with the same color. We investigate the computational complexity of this problem and give exact results and bounds for different families of segments, including those corresponding to complete bipartite graphs, cactus graphs, and triangle-free graphs. We also relate the problem to the famous Erdős–Faber–Lovász Conjecture, and discuss computational experiments for certain randomly generated sets of segments.

Keywords

Line segment, intersection, cactus graph, Erdős–Faber–Lovász Conjecture.

Biography

Dr. Boris Brimkov received his B.S. in Mathematics from the University at Buffalo and his M.A. and Ph.D. in Computational and Applied Mathematics from Rice University. His doctoral work was funded by an NSF Graduate Research Fellowship. He was a Postdoctoral Fellow at the Rice Academy of Fellows and joined Slippery Rock University in the fall of 2019. Broadly, his academic interests center on using graph theory and combinatorial optimization to model and solve practical problems with societal impacts.