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Boris Brimkov, Jesse Geneson, Alatheia Jensen* (jensena@susqu.edu), **Jordan Miller** and **Pouria Salehi Nowbandegani**. *Intersections, circuits, and colorability of line segments*.

We derive sharp upper and lower bounds on the number of intersection points and closed regions that can occur in sets of line segments with certain structure, in terms of the number of segments. We consider sets of segments whose underlying planar graphs are Halin graphs, cactus graphs, maximal planar graphs, and triangle-free planar graphs, as well as randomly produced segment sets. We also apply these results to a variant of the Erdős-Faber-Lovász (EFL) Conjecture stating that the intersection points of m segments can be colored with m colors so that no segment contains points with the same color. We investigate an optimization problem related to the EFL Conjecture for line segments, determine its complexity, and provide some computational approaches. (Received September 03, 2019)