

Consider a set B of blue points and a set R of red points in the plane such that $R \cup B$ is in general position. A graph drawn in the plane whose edges are straight-line segments is called a geometric graph. We investigate the problem of drawing non-crossing properly colored geometric graphs on the point set $R \cup B$. We show that if $||B| - |R|| \leq 1$ and a subset of R forms the vertices of a convex polygon separating the points of B , lying inside the polygon, from the rest of the points of R , lying outside the polygon, then there exists a non-crossing properly colored geometric path on $R \cup B$ covering all points of $R \cup B$.

If $R \cup B$ lies on a circle, the size of the longest non-crossing geometric path is related to the size of the largest separated matching; a separated matching is a non-crossing properly colored geometric matching where all edges can be crossed by a line. A discrepancy of $R \cup B$ is the maximal difference between cardinalities of color classes of intervals on the circle. When the discrepancy of $R \cup B$ is at most 2, we show that there is a separated matching covering asymptotically $\frac{4}{5}$ of points of $R \cup B$. During this proof we use a connection between separated matchings and the longest common subsequences between two binary sequences where the symbols correspond to the colors of the points.