Title: Universality of point sets for alternating Hamiltonian paths

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Abstract: The set M of n points in the plane is universal for a graph G on n vertices if for every coloring of G that does not create a monochromatic edge, and every coloring of S, G can be drawn on S such that the edges are drawn as straight lines and do not intersect. This work will only deal with two-colored cases, where we have red and blue points. We will describe a specific coloring of a set of 16 points on a circle, where half are red and half are blue, in which there is no alternating Hamiltonian path. We will show that a set of points of even length less than 16 lying on a circle is universal. In the work, we introduce the double-arc configuration, which is similar to the well-known double-chain configuration, where one of the arcs is mirror-inverted. The goal of this work is to prove that the set of points in the double-arc configuration is not universal.

Keywords: Universal point set, alternating Hamiltonian path, graph