36 TWO-COLORED POINTS WITH NO EMPTY MONOCHROMATIC CONVEX FOURGONS

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Devillers, Hurtado, Károlyi, and Seara [3] conjectured that each sufficiently large two-colored point set, with no three points collinear, contains an empty monochromatic convex fourgon. This can be answered in the affirmative if we disregard convexity [1]. An example of 18 points with no empty monochromatic convex fourgon from [3] raised the problem of finding the maximum number of two-colored points that do not contain an empty monochromatic convex fourgon. Improved lower bounds were given by Brass – 20 points [2], Friedman – 30 points [4], and van Gulik – 32 points [5]. Here we show a set of 36 two-colored points, no three points collinear, with no empty monochromatic convex fourgons.

References

[1] O. Aichholzer, T. Hackl, C. Huemer, F. Hurtado, and B. Vogtenhuber, Large bi-colored point sets admit empty monochromatic 4-gons. Preprint, 2008.

[2] P. Brass, Empty monochromatic fourgons in two-colored point sets. *Geombinatorics* XIV(2), 5–7, 2004.

[3] O. Devillers, F. Hurtado, G. Károlyi, and C. Seara, Chromatic variants of the Erdős-Szekeres Theorem. *Computational Geometry, Theory and Applications* 26(3), 193–208, 2003.

[4] E. Friedman, 30 two-colored points with no empty monochromatic convex fourgons. *Geombinatorics* XIV(2), 53–54, 2004.

[5] R. van Gulik, 32 two-colored points with no empty monochromatic convex fourgons. *Geombinatorics* XV(1), 32–33, 2005.

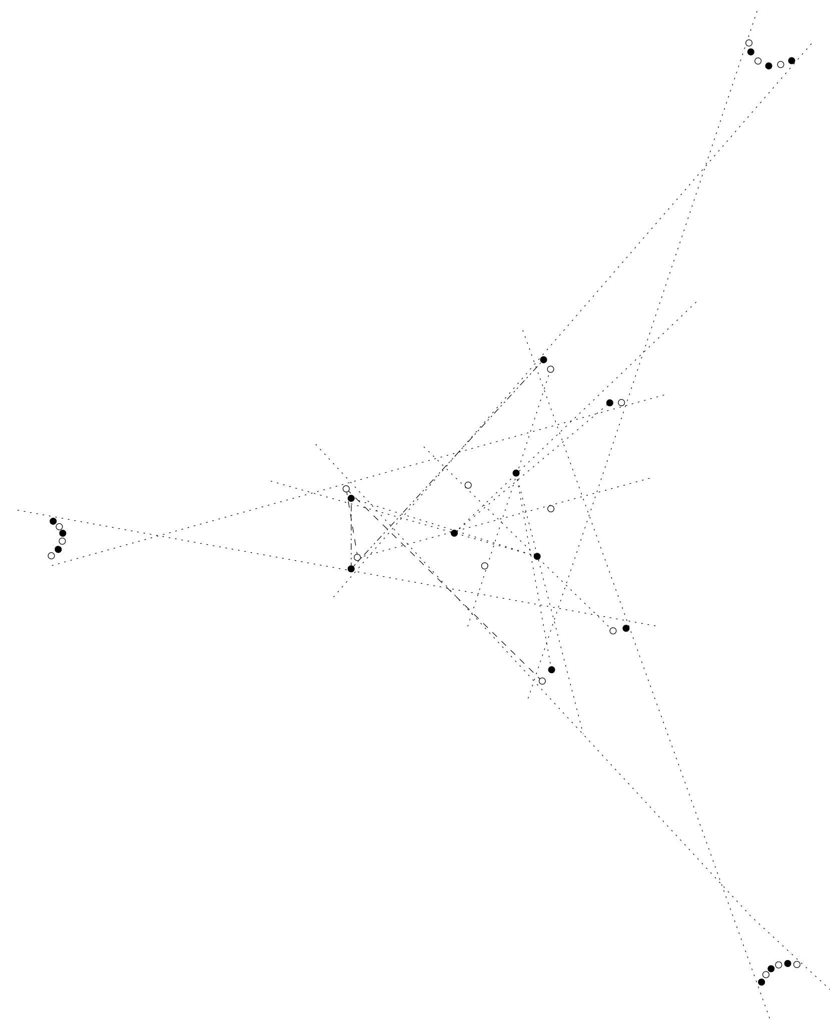

Figure 1: 36 two-colored points with no empty monochromatic convex fourgon, and some supporting lines of the set.