

Abstract Submitted
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Voronoi Cell Patterns: Application of the size distribution to societal systems¹ RAJESH SATHIYANARAYANAN², DIEGO LUIS GONZÁLEZ³, ALBERTO PIMPINELLI⁴, T.L. EINSTEIN, U. of Maryland — In studying the growth of islands on a surface subjected to a particle flux, we found it useful to characterize the distribution of the areas of associated Voronoi (proximity or Wigner-Seitz) cells in terms of the generalized Wigner surmise⁵ and the gamma distributions. Here we show that the same concepts and distributions are useful in analyzing several problems arising in society.⁶ We analyze the 1D problem of the distribution of gaps between parked cars, assuming that successive cars park in the middle of vacant spaces, and compare with published data. We study the formation of second-level administrative divisions, e.g. French *arrondissements*. We study the actual distribution of *arrondissements* and the Voronoi tessellation associated with the chief town in each. While generally applicable, there are subtleties in some cases. Lastly, we consider the pattern formed by Paris Métro stations and show that near the central area, the associated Voronoi construction also has this sort of distribution.

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⁵AP & TLE, PRL 99 (2007) 226102; PRL 104 (2010) 149602

⁶DLG et al., arXiv 1109.3994; RS, Ph.D. dissertation; RS et al., preprint

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