Some Geometric Optimization Problems in Wireless Networks

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I will present some new results regarding *discrete piercing*. In the typical discrete piercing problem one is given a set of disks of arbitrary radii, where the piercing points are restricted to a given set of points in the plane and the goal is to minimize the number of chosen piercing points. This problem has applications in clustering and routing aspects of ad-hoc and sensor networks, where the set of chosen piercing points can be used as a representative set of stations. This work is joint with Matya Katz and Paz Carmi.

For the discrete piercing of unit disks, only a constant approximation algorithm is known and I will talk about our new algorithm that achieves substantial improvement of the approximation ratio. This problem is equivalent to the problem of covering a set of points by unit disks.

I will also present a result for the problem of conflict free coloring of unit disks in the plane, and talk about its applications to frequency assignment in wireless networks. This work is joint with David Peleg (Weizmann Inst.).

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