On the Bounded-Hop Power Assignment Problem

Domagoj Matijević

We will present the problem of assigning transmission ranges to radio stations in the plane such that any pair of stations can communicate within a bounded number of hops h and the cost of the network is minimized. The cost of transmitting in a range r is proportional to r^{α}, where $\alpha \geq 1$.
This will be an overview talk, presenting the state-of-the-art results known so far. In addition to that several open problem will be presented. Most of the results presented will be based on ideas and techniques presented in [6].

References:

[1] Gruia C_alinescu, Sanjiv Kapoor, and Mohammad Sarwat. Bounded-hops power assignment in ad hoc wireless networks. Discrete Applied Mathematics, 154(9):1358-1371, 2006.
[2] A. E. F. Clementi, P. Penna, and R. Silvestri. On the power assignment problem in radio networks. Mob. Netw. Appl., 9(2):125-140, April 2004.
[3] A.E.F. Clementi, A. Ferreira, P. Penna, S. Perennes, and R. Silvestri. The minimum range assignment problem on linear radio networks. In ESA, pages 1-12, 2000.
[4] Andrea E.F. Clementi, Miriam Di Ianni, and Riccardo Silvestri. The minimum broadcast range assignment problem on linear multi-hop wireless networks. Theoretical Computer Science, 299(13):751-761, 2003.
[5] G. K. Das, S. C. Ghosh, and S. C. Nandy. Improved algorithm for minimum cost range assignment problem for linear radio networks. Int. J. Found. Comput. Sci., 18(3):619-635, 2007.
[6] Soeren Laue and Domagoj Matijević. Approximating k-hop minimum spanning trees in Euclidean metrics. Inf. Process. Lett., 107(3-4):96-101, 2008.