
LADISLAV STACHO, Simon Fraser University

Strong orientations of plane networks

Directional antennae are widely used in wireless networks not only for reducing energy consumption and interference, but also for improving routing efficiency and security. Caragiannis et al. (2008) were the first to propose the problem of orienting the antennae of a set of sensors in the plane to produce a strongly connected network and compared the range used to the maximum link length of the minimum spanning tree on the set of sensors. I will discuss possible models of the problem, survey known results, and then will concentrate on the case when the transmission range of sensors is not increased (compared to the original omnidirectional antennae range) as well as antennae have spread 0. In this setting the problem reduces to orienting original links of a network to obtain a strongly connected network. We consider this problem with an additional requirement (which was not considered in the literature before); we also want to bound the stretch factor of the new directed network. I will show some proofs of tradeoffs between number of links that need to be oriented and the resulting stretch factor. This is joint work with E. Kranakis and O. Morales.