



SECRECY TRANSFER FOR SENSOR NETWORKS: FROM RANDOM GRAPHS TO SECURE RANDOM GEOMETRIC GRAPHS

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Abstract: Suppose n nodes with n_0 acquaintances per node are randomly deployed in a two-dimensional Euclidean space with the geographic restriction that each pair of nodes can exchange information between them directly only if the distance between them is at most r , the acquaintanceship between nodes form a random graph, while the physical communication links constitute a random geometric graph. To get a fully connected and secure graph, we introduce a secrecy transfer algorithm which combines the random graph and the random geometric graph via an introduction process to produce an acquaintanceship graph G_{n,n_0} . We find that the maximum component of graph G_{n,n_0} transitions rapidly from small components to a giant component when n_0 is larger than a threshold, the threshold is derived, and applications for sensor networks are presented.

Keywords: *Random graph, Random geometric graph, Sensor networks, Security.*