



A REVIEW OF ENERGY OPTIMAL TOPOLOGY CONTROL FOR LARGE WIRELESS NETWORK USING YAO-GRAPH AND ITS VARIANTS

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Abstract: The advent of wireless communication and networking in the last two decades has led to the need of modification in the regular graphs used as spanners. The spanner is a sub graph of the original graph which connects the essential nodes for transmission of the message. For this purpose the Omni directional antennas are usually used and the “spanner-graph” performance metric is a constant multiplied by the same of the original graph. This constant is known as the “stretch factor”. One of the most common attribute for wireless communication is the energy required for faithful transmission of a message between two nodes. But the Omni directional antennas lead to interference and wastage of bandwidth and energy. The nodes of wireless communication are however neither

always static nor equipped with any infrastructure. Rather the same might as well be ad-hoc and mobile. Another well used notion is that of the unit disk graph (UDG), where a node can communicate only if the other nodes are within the disk of unit radius. However the graph being dynamic in nature, the nodes do not have fixed transmission radii and the same changes according to the power requirement of transmission. This work of ours mainly deals with the different graphs being used as spanners. It explains a few algorithms described in other papers which it reviewed. The associated algorithms are related to Yao graph. This graph and its modifications are discussed and it is explained how they could be used energy efficiently. The Yao-Yao graph for example can be used as a spanner for certain specific values of stretch factors.

Keywords: Yao-graph, Yao-Yao graph, Theta-graph, Spanner, Unit disk graph, Power, Degree bound.

