In this work, we analyze the geographical threshold graph (GTG) model of the network. It is assumed that the vertices $v_i \in V$ are uniformly and independently distributed in the $d$-dimensional space $\mathbb{R}^d$, which is provided with the Euclidean metric. Usually, real networks are embedded into a topological space, with the wiring costs (or social costs) being represented as metric distances.

In GTG model, each vertex $v_i$ is assigned to random weight $w_i$, drawn from a density distribution $f(w)$. Edges are created according to a threshold function $T$, which depends on the distances between vertices and the density distribution of weights $f(w)$ in the graph. The main contribution of this work is that for a given degree distribution $p_d(k)$ we derive a set of sufficient conditions on $T$ which enables us to explicitly, analytically calculate the density function of weights $f(w)$.

Recently there has been an extensive research towards establishing mathematical models which emulates the real networks: Internet, WWW, social networks, biological and independent systems. Since our model is very general, the analysis which we derived can be applied in many different areas – the wireless communication systems, the financial markets, etc.