# A first approach to security analysis on networks with ancilliary points

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Network analysis has been an active research field in several scientific areas like social sciences, computer sciences, physics or mathematics. From a computer science perspective, networks we are interested with in this work, can be identify by a graph $G = (V, E)$, where $V$ is the vertex set - individuals that could be computers or other connected devices -and $E$ is the set of links between them. Therefore, two individuals are connected if there exists information exchange between them. This kind or graphs deals with symmetric binary and null-diagonal adjacency matrices which contain relevant information about the structure of the network. Our objective is to hide topological features of the network in order to protect it against target attacks.

This initial study proposes to add ancilliary individuals and connections to the original network by means of simple stochastic algorithms, analyzing variations on centrality properties in some particular simulated cases.

## References

[1] A. BARABSI, A. RKA AND J. HAWOONG , Mean-field theory for scale-free random networks, *Physica A: Statistical Mechanics and its Applications.* **272, 1-2** (1999), pp.173-787.

[2] S.P. BORGATTI, DYNAMIC SOCIAL NETWORK MODELING AND ANALYSIS: WORKSHOP SUMMARY AND PAPERS, R. Breiger, K. Carley, P. Pattison, Eds. (National Academy of Sciences Press, Washington, DC) (2003)

[3] S.P. BORGATTI, A. MEHRA, D. BRASS AND G. LABIANCA, Network Analysis in the Social Sciences, *Science*, **323**, (2009) 892-895. DOI: 10.1126/science.1165821

[4] U. BRANDES AND T. ERLEBACH *Network Analysis*, Lecture Notes in computer Science, Springer Berlin Heidelberg New York, (2005).

[5] G. CANRIGHT AND K. ENGO-MONSEN, Some relevan aspects of network analysis and graph theory, *Handbook of network and system administration*, (2007), pp. 361-424.

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