

## **Modelling Attacks and Challenges to Wireless Networks**

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Due to the tremendous potential of MANETs (mobile ad hoc networks) for deployment in commercial and military services, a thorough understanding of network behaviour when exposed to challenges is essential for constructing a resilient and survivable MANET. Therefore, it is vital to have a comprehensive framework that can model it under various network attacks and challenges. The MANET environment has a dynamic and intermittent connectivity resulting from channel fading and mobility of the nodes, which makes it difficult to model the network as well as its challenges. We provide a model to simulate malicious and area-based challenges to wireless networks. In the modelling of malicious attacks, we treat MANETs as time-varying graphs (TVGs) represented as a weighted adjacency matrix, in which the weights refer to the link availability. We evaluate the relations between node significance and weighted centrality metrics. Area-based challenges representative of real-world scenarios are also modelled. Our ultimate goal is to provide a comprehensive network challenge model of MANETs and also heterogeneous networks.