



IV. International Conference on Mathematics and its Applications in Science and Engineering

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Title: New trends on malware propagation: from IoT environments to drone swarms

Abstract: Currently, due to the degree of digitalization of our society, the main goal of Mathematical Epidemiology is not only the development of mathematical models for the study of communicable diseases caused by biological agents but also the study and analysis of the propagation of malicious code (malware) on different types of networks.

This new scenario has not been managed in a proper way since the study of the new malware models has been based on the same epidemiological framework than those devoted to biological agents. Then both the epidemiological coefficients and the types of incidences used in their development are defined analogously to those used in the case of biological agents. Consequently, the great majority of the proposed mathematical models to simulate malware propagation lack sufficient realism to consider them efficient. Likewise, new techniques related to Complex Network Analysis and Machine Learning that have appeared in recent years can be very effective in developing of these new families of models.

The main goal of this talk is to show a reformulation the fundamentals of Mathematical Epidemiology to the case of the spread of malicious code and, at the same time, to explore the use of new techniques to design and analyze novel models that predict malware behavior in different scenarios such as IoT environments or drone swarms.