

## Accepted Manuscript

A predator–prey model on the attacking behavior of malicious objects in wireless nanosensor networks

Ajit Kumar Keshri, Bimal Kumar Mishra, Dheeresh K. Mallick

PII: S1878-7789(17)30072-8

DOI: <https://doi.org/10.1016/j.nancom.2018.01.002>

Reference: NANCOM 198

To appear in: *Nano Communication Networks*

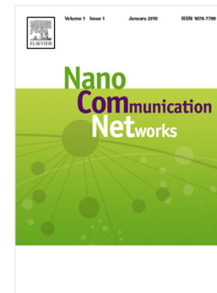
Received date: 23 June 2017

Revised date: 12 December 2017

Accepted date: 17 January 2018

Please cite this article as: A.K. Keshri, B.K. Mishra, D.K. Mallick, A predator–prey model on the attacking behavior of malicious objects in wireless nanosensor networks, *Nano Communication Networks* (2018), <https://doi.org/10.1016/j.nancom.2018.01.002>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



## A predator-prey model on the attacking behavior of malicious objects in wireless nanosensor networks

Ajit Kumar Keshri<sup>a</sup>, Bimal Kumar Mishra<sup>b\*</sup>, Dheeresh K. Mallick<sup>c</sup>

<sup>a</sup>Ajit Kumar Keshri, Department of Computer Science and Engineering, Birla Institute of Technology, Mesra, Ranchi, Jharkhand, India-835215 (ajitkeshri@bitmesra.ac.in)

<sup>b\*</sup>Bimal Kumar Mishra, Jagannath Jain College, Jhumritelaiya, Jharkhand, India-825409 (drbimalmishra@gmail.com) (Corresponding author)

<sup>c</sup>Dheeresh K. Mallick, Department of Computer Science and Engineering, Birla Institute of Technology, Mesra, Ranchi, Jharkhand, India-835215 (dkmallick@gmail.com)

### Abstract

In this paper, we envision attacks of malicious objects and their transmission in wireless nanosensor networks (WNSNs) with the help of a predator-prey model. Here the prey consists of susceptible nanosensor nodes, susceptible nanosensor nodes with vaccination and infectious nanosensor nodes, whereas the predator consists of terminally infected nanosensor nodes. The dynamics of the system is analyzed at different equilibrium points to find the conditions for their stability. Impact of vaccination on the overall system is also analyzed. Extensive numerical simulation is performed to validate the vitality of the model developed. In short, the goal of this model is to determine whether WNSNs are able to survive against attacks of malicious objects or not and can vaccination play a key role in it.

**Keywords:** wireless nanosensor network; malicious object; predator-prey model; stability; vaccination.

### 1. Introduction

Technology based on miniaturization with bottom-up approach in the design and development of powerful devices is termed as nanotechnology [1]. The presence of nanotechnology is already

Download English Version:

<https://daneshyari.com/en/article/6886036>

Download Persian Version:

<https://daneshyari.com/article/6886036>

[Daneshyari.com](https://daneshyari.com)