

# **IMPROVING THE EFFICIENCY OF IDPS BY USING HYBRID METHODS FROM ARTIFICIAL INTELLIGENCE**

*Digest of paper<sup>1</sup>*

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**Abstract:** The present paper describes some of the results obtained in the Faculty of Computer Systems and Technology at Technical University of Sofia in the implementation of project related to the application of intelligent methods for increasing the security in computer networks. Also is made a survey about existing hybrid methods, which are using several artificial intelligent methods for cyber defense. The paper introduces a model for intrusion detection systems where multi agent systems are the bases and artificial intelligence are applicable by the means simple real-time models constructed in laboratory environment

**Key words:** multi-agent systems, artificial intelligence, network and information security, intrusion detection system, intrusion prevention system, reinforcement learning.

## **REFERENCES**

- [1] Trifonov R., S. Manolov, G. Tsochev, Application of multi-agent systems for network and information protection, 28th International Conference on Information Technologies (InfoTech-2014), 18-19 September 2014 Varna – St. St. Constantine and Elena resort, Bulgaria, ISSN: 1314-1023, pp 137-142
- [2] Georgi Tsochev, An Investigation of Multi-Agent System Model for Intrusion Detection/Prevention, International Journal of Advanced Research in Computer and

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- [3] G. Tsochev, R. Trifonov, G. Popov, A security model based on multi agent systems, participation in XXIX International Conference on Information Technologies InfoTech-2016, St. St. Constantin and Elena resort, Bulgaria 2016.
- [4] Roumen Trifonov et al, A Survey of Artificial Intelligence for Enhancing the Information Security, International Journal of Development Research, Vol. 07, Issue, 11, November, 2017, ISSN: 2230-9926, pp.16866-16872 (IF 4.753)
- [5] R. Trifonov, G. Tsochev, R. Yoshinov, S. Manolov, G. Pavlova, Conceptual model for cyber intelligence network security system, international journal of computers, Volume 11, 2017 , ISSN: 1998-4308, pp. 85-92
- [6] P. A., „The State of the Art in Intrusion Prevention and Detection,“ CRC Press, Boca Raton, Florida.
- [7] Cerli, A. A., and Ramamoorthy, S. Intrusion Detection System by Combining Fuzzy Logic with Genetic Algorithm. Global Journal of Pure and Applied Mathematics (GJPAM),11(1), 2015
- [8] Rajasekaran, Sanguthevar and Pai, G. A. Vijayalakshmi Neural networks, fuzzy logic, and genetic algorithms: synthesis and applications (Eastern economy ed). Prentice-Hall of India, New Delhi, 2015
- [9] R. Sutton and A. Barto, Reinforcement learning. Cambridge, Mass.: MIT Press, 2015.
- [10] Roumen Trifonov et al, Adaptive Optimization Techniques For Intelligent Network Security, 4th International Conference on Mathematics and Computers in Sciences and Industry MCSI 2017, August 24-26, 2017, Corfu Island, Greece, Conference Publishing Services of IEEE (2017), ISBN-13: 978-1-5090-0973-2. Young, The Technical Writer's Handbook. Mill Valley, CA: University Science, 1989.
- [11] N. Athanasiades, R. Abler, J. Levine, H. Owen и G. Riley, „Intrusion detection testing and benchmarking methodologies,“ в Proceedings of the First IEEE International Workshop on Information Assurance (IWIA'03), Washington, 2003.
- [12] Rajdeep Borgohain, "FuGeIDS: Fuzzy Genetic paradigms in Intrusion Detection Systems," International Journal of Advanced Networking and Applications, vol. 3, no. 6, pp. 1409-1415, 2012.