

https://doi.org/10.59849/aidd.2024.81

## **Discovering Realistic Behaviours with Artificial Intelligence**

## **Murat SARI**

Department of Mathematical Engineering, Faculty of Science and Letters, Istanbul Technical University, 34469 Istanbul, Turkey, E-mail: muratsari@itu.edu.tr

**Abstract.** Prediction of behaviours representing physical processes has long attracted the attention of the academic community. In parallel with the diversity of scientific developments, it has been shown in the literature that many of these discoveries are quite costly for many reasons. This research seeks to best forecast the behaviours represented by these processes using artificial intelligence methodologies, which are an essential alternative to standard computational methods that confront numerous challenges in real life. To establish a firm foundation for this idea, various processes have been devised to forecast the behaviour represented by models closer to actuality in life. As a result, rather than emphasizing the importance of physical reality, this study demonstrates how successful artificial intelligence modelling is, even in extremely challenging situations. Furthermore, it is believed that this research will lead to the development of novel ways for efficiently modelling various complex processes.

Keywords: Artificial intelligence modelling, Steep behaviour, Nonlinear behaviour, Reality.

## References

- 1. Loske, A. M. and Loske, A.M. (2017). Shock waves as used in biomedical applications. In Medical and Biomedical Applications of Shock Waves (pp. 19-42). Springer.
- 2. M. Sari, S. Duran, H. Kutlu, B. Guloglu and Z. Atik, "Various optimized machine learning techniques to predict agricultural commodity prices", Neural Computing and Applications, 36, 11439-11459, 2024
- **3.** H.U. Tuna, M. Sari, and T. Cosgun, "A discretization-free deep neural network-based approach for advection-dispersion-reaction mechanisms", Physica Scripta, 99(7), 076006, 2024.
- 4. H. Tunc, M. Sari and E.S. Kotil, "Machine learning aided multiscale modelling of the HIV-1 infection in the presence of NRTI therapy", PeerJ, 11: e15033, 2023
- M. Sari, I.E. Yalcin, M. Taner, T. Cosgun, and I.I. Ozyigit, "Forecasting contamination in an ecosystem based on a network model", Environmental Monitoring and Assessment, 195:536, 2023
- 6. M. Sari, I.E. Yalcin, M. Taner, T. Cosgun, and I.I. Ozyigit, "An investigation on environmental pollution due to essential heavy metals: a prediction model through multilayer perceptrons", International Journal of Phytoremediation, 25(1), 89-97, 2023
- 7. T. Cosgun and M. Sari, "A novel method to investigate nonlinear advection-diffusion processes", Journal of Computational and Applied Mathematics, 425, 115057, 2023
- 8. H. Tunc and M. Sari, An implicit-explicit local method for parabolic partial differential equations, Engineering Computations, 39(3), pp. 1020-1037, 2022.
- **9.** M. Sari, T. Cosgun, I.E. Yalcin, M. Taner, and I.I. Ozyigit, "Deciding heavy metal levels in soil based on various ecological information through artificial intelligence modelling", Applied Artificial Intelligence, 36(1), e2014189, 2022.