p-Adic Analysis in the Age of Big Data

K. Oleschko and B. Fujii Oleshko.

ABSTRACT

In the Era of Big Data, the contemporary science and business world confront the extensively documented fail of traditional approaches (1). The big data (BD) testing is still realizing by standard software tools while some data mining algorithms look very promising for knowledge discovery from BD advanced analytics (2). In this contribution we discuss how to combine the software develops with data science, giving some experimental examples and documenting new opportunities for knowledge extraction from big data. Our main ansatz is that each Big Data, extracted from the real-world, encrypted the genetic code, which can be translated into computer coding. Therefore, from our point of view, this is not only the Era of Big Data but also the Era of Consciousness of the Entropy, Number Theory and especially p-Adic Physics as the Leaders of Big Data mining and knowledge discovery, which include principles, algorithms and applications (3). The singularity spectrum, intermittency, extreme values, multifractality and computability are becoming especially useful for quantitative interpretation of system´s space-time complexity. In a training set analysis and modeling the user is looking for the presence of more than one possible classification (4). In real world data studies we founded near universal, statistically representative and visual arrangement of numbers patterns for studied complex systems, which can be translated into computer code, improving the system numerical modeling. The examples of our approach are discussed.

References:

1. Admin, Big Data Technology, 2018. *Why traditional approaches fail in the era of big data*. http://www.entradasoft.com/why-traditional-approaches-fail-. in-the-era-of-big-data/

2. Hand, D., Mannila. H. and P. Smith, 2014. *Principles of Data Mining.* The MIT Press, 322p.

3. Koutra, D. and Faloutson, Ch., 2017. *Individual and Collective Graph Mining: Principles, Algorithms, and Application.* Copyrig*ht*@2018 by Morgan and Claypool, 2007p.

4. Kim, B. S., Kang, B.G., Choi, S.H., 2017. *Data modeling versus simulation modeling in the big* data era: ca*se study of a greenhouse control system.* Simulation: Transactions of the Society for Modeling and Simulation International. Vol. 93 (7): 579-594.