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4th International Conference on

BIG Data Analysis and Data Mining

September 07-08, 2017 | Paris, France

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Big data analysis and approximations in information systems

With the increasing use of advanced technology, the amount of data in our world has been exploding. Big data analytics can examine large data sets and uncover hidden patterns. On the other hand, poor quality of big data results in some inaccurate insights or compliance failures that give rise to partially complete information systems. In order to obtain complete information systems, we use Rough Set Theory (RST), which was introduced by Pawlak in 1982 as a way to deal with data analysis based on approximation methods in information systems. The theory has many applications in a number of different areas, such as engineering, environment, banking, medicine, bioinformatics, pattern recognition, data mining, machine learning and others. RST is intrinsically a study of equivalence relations on the universe (a set of object). In fact, rough sets can be used to represent ambiguity, vagueness and general uncertainty. Given some relations between objects in the set, we can construct lower and upper approximations of the objects. We intend to use some advanced computing methods to determine lower and upper approximations and find several properties of the characteristics of objects within RST, as well as to extend RST to generalized RST. This line of research has to do with some developments in big data analytics. Traditional algorithm cannot satisfy the needs of big data computing. In this presentation, we will show some advanced computing methods that can solve our problems effectively. We will also present several examples to illustrate the concepts introduced in this presentation.

Biography

En-Bing Lin is a Professor of Mathematics at Central Michigan University, USA. He has been associated with several institutions including Massachusetts Institute of Technology, University of Wisconsin-Milwaukee, University of California, Riverside, University of Toledo, UCLA, and University of Illinois at Chicago. He received his PhD from Johns Hopkins University. His research interests include Data Analysis, Applied and Computational Mathematics, and Mathematical Physics. He has supervised a number of graduate and undergraduate students. He serves on the editorial boards of several journals. He has organized many special sessions at regional IEEE conference.

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J Comput Eng Inf Technol
ISSN: 2324-9307

Data Mining 2017
September 07-08, 2017

Volume 6, Issue 5

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