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Editorial

Analytics—Systematic Computational Analysis of Data

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Since the envisioning of the concept of *Artificial Intelligence* in the 1950s, the interest in making machines emulate human behavior has increased, scientific dedication has grown, and, consequently, new concepts have appeared, with unequal success. At that time, controversy unfolded over the term *artificial*, competing with the term *computational*, which might have been considered more appropriate. Similarly, the concept of *Data Mining*, which has become part of our vocabulary unrefuted, is more of an example of a blunder than success. In mining, we usually search for minerals, and therefore, we speak of gold mining or copper mining, but we do not speak of mountain mining (Oxford Dict.: to dig holes in the ground in order to find and obtain coal, diamonds, etc.). Mining, in our case, has an aim—knowledge. Therefore, much more accurate would have been the concept of *Knowledge Mining*. To be sure, *Data Mining* can exist but only as a previous step when no data are available.

In other cases, the misconception is minor, but it generates confusion. For example, the concept of *Deep Learning* refers to the inclusion of nonlinearity in the analysis and does not exclusively concern *Artificial Neural Networks*. The term *deep* seems to be univocally attached to *Neural Networks*, but in theory, we could also address nonlinearity with other techniques, for instance, *Evolutionary Computation*.

Recently, another concept has gained enormous relevance: *Data Science*. This is a clumsy simplification that devalues the discipline. Analogously, we might disqualify an architect by calling the profession *Brick Scientist*, although many children who demonstrate great *LEGO*® skills might receive this appellation. Data has no science. A datum is a symbolic representation of a fact. Therefore, unless we want to investigate how facts can be represented and transferred to machines, the meaning of the expression is rather vague, because its strict semantic meaning differs substantially from the colloquial interpretation of the concept.

Finally, some concepts, such as *Big Data*, are so puerile as to hardly be unworthy of discussion—imagine a field named *Big Wind*, within the field of wind energy. The deficit of semantic precision has been replaced by the incorporation of many Vs, more and more, although none has been properly quantified to provide a formal definition of the concept.

In general, a lack of rigor exists in the coining of scientific concepts. Some are correct (*Machine Learning*), whereas others are inaccurate (*Data Science*), and still others are misinterpreted (*Deep Learning*), wrong (*Data Mining*), or even absurd (*Big Data*).

The semantic vagueness in definitions is especially remarkable in the use of the word *analytics* or, more precisely, in its absence. Merriam Webster's dictionary defines *analytics* as "*the method of logical analysis*". The Collins dictionary definition is similar: "*the science of logical analysis*". *Analytics* is related to "*systematic analysis in a context*". Sometimes, we deal with real-world data (*analytical* method) but often, in everyday life, only with perceptions (*analytical* mind). However, the word *analytical* is unequivocally used to provide systematization.

The presence of the word *analytics* in the scientific literature is growing over the last few years. A search in Scopus using the time range 2000–2021 shows an average annual increasing evolution of the usage frequency in titles and abstracts of published articles of about 25%. The abundance of the word *analytics* seems supreme and projects substantial

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growth in the coming years. Nevertheless, it is omitted in some expressions in which its participation could be very clarifying. For example, *Data Analytics Science* would be a correct expression that would precisely define the science of *Data Analytics*, i.e., the body of knowledge related to the analysis from a mathematical and algorithmic point of view. Another example would be *Data Analytics Engineering*, which would define the set of techniques that enable the systematic application of the knowledge that dwells in *Data Analytics Science*. In other words, *Data Analytics Science* deals with the research and development of formal techniques that contribute to the quality of data analysis. In contrast, *Data Analytics Engineering* refers to the analysis, design, implementation, and deployment of *Data Analytics* projects, involving a variety of *Data Analytics Science* techniques. Comparatively, a chemical engineer uses chemistry but is not a chemist. The chemist achieves advances in the scientific field; the engineer uses these advances to provide solutions to practical problems. In any case, the participation of the word *analytics* is essential to enrich with nuances the meaning of the tasks to be performed with the data.

Analytics gives its name to this journal to embrace both realms of data analysis (science and engineering), giving more specific weight to the semantic interpretation related to *systematic analysis*. In many projects, the methodological design is more important than its components. A project for the prediction of the quality of potable water is very different from one that seeks to optimize the extraction of copper. Scientific, technological, and engineering elements will be involved in the project design to meet the business goals with which it is associated.

The ***Analytics*** journal aims to contribute to the consolidation of the profiles of a *Data Analytics Scientist* and *Data Analytics Engineer*, which are receiving considerable attention in the labor market. Both profiles can coexist and collaborate, but the responsibility for the success of a project should fall on the *Data Analytics Engineer*. This last profile will be of utmost importance in the coming years.

The main objective of the ***Analytics*** journal is to present and disseminate successful *Data Analytics Projects*, in multiple domains, with a solid methodological structure, and where innovative elements differentiate the adopted solution.

The ***Analytics*** journal is exclusively devoted to the publication of high-quality reviews, regular theoretical and applied research papers, and short communications in the field of the systematic computational analysis of data.

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Short Biography of Author

Jesús S. Aguilar-Ruiz is a Full Professor of Data Analytics at the School of Engineering, Pablo de Olavide University, Seville, Spain, since 2012, where he served as founder Dean from 2005 to 2015. He visited the University of Reading (2002), the University of Massachusetts at both Amherst (2003) and Boston (2004, 2005) and conducted research stays at the University of Bologna (2007), the National Institute of Genetics, Japan (2008), and the Swiss Data Science Center, ETH Zurich, Switzerland (2019). He has served as Data Analytics Consultant for many years in the industry and participated in numerous R&D projects in collaboration with public and private institutions. Currently, he serves as a project evaluator for seven international agencies, and as a reviewer for the most important journals in the field. He has also founded four start-up IT companies.