Analytical Focus and Contextuality, Exploiting Resolution Scale, Addressing Bias Fionn Murtagh, Professor of Data Science, Centre of Mathematics and Data Science, School of Computing and Engineering, University of Huddersfield, Huddersfield, UK

Abstract. Examples are provided of the following. The Correspondence Analysis, also termed Geometric Data Analysis, platform, exploiting conceptual resolution scale, and having both analytical focus and contextualization, this semantically maps qualitative and quantitative data. Big Data analytics has new challenges and opportunities, and key factors are security through aggregation and ethical accuracy of individual mapping; and process-wise, this is multi-resolution analysis carried out. For the analytical topology of the data, from hierarchical clustering, the following is developed, with properties noted here, and essentially with linear time computational complexity. For text mining, and also for medical and health analytics, the analysis determines a divisive, ternary (i.e. p-adic where p = 3) hierarchical clustering from factor space mapping. Hence the topology (i.e. ultrametric topology, here using a ternary hierarchical clustering), related to the geometry of the data (i.e. the Euclidean metric endowed factor space, semantic mapping, of the data, from Correspondence Analysis). Determined is the differentiation in Data Mining of what is both exceptional and quite unique relative to what is both common and shared, and predominant. A major analytical theme, started now, is for Mental Health, with analytical focus and contextualization, with the objective for interpretation of mental capital. Another analytical theme is to be for developing economies.



Biography

BA Mathematics, BAI Engineering Science, from Trinity College Dublin, MSc, information retrieval. PhD, Doctorat de troisième cycle, from Professor Jean-Paul Benzécri, Mathematical Statistics, in Université Pierre et Marie Curie, Paris 6. HDR degree, "Pattern Recognition in Astronomy", from what is now Université de Strasbourg. In 1984, I was a visiting scientist, in the Joint Research Centre, Centro comune di ricerca, Ispra, Italy. For 12 years, Senior Scientist in the European Space Agency, for the Hubble Space Telescope, based in the European Southern Observatory, in Garching, Munich, Germany. I have 28 books published, many edited; 175 journal papers; 42 survey and contributed articles in books, 127 papers in conference proceedings and edited volumes. Listed on my web page, www.fmurtagh.info, are publications, Membership and Fellowship of many organisations; the organisations where I am the Chair, or Board member or Council member; medals awarded; and journal editorial work.

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