



Preface and Acknowledgements

Despite of the World crisis, I am happy to meet old and new friends in occasion of the fifth edition of our Mediteraneum Meeting, attempting to divulge and encourage the use of “Advanced Statistical Methods” in the “Environment” and “Cultural Heritage” fields.

As in the previous editions, I like to repeat the statement of Donald D. Hester: The world is multivariate! In order to be significant, data coming from diagnostic on Environment as well as on Cultural Heritage must be multivariate [1].

A magnificent summary of the purpose of our meeting!

Environment and Cultural Heritage (CH)

Even if not so evident for common people, the conservation state of Cultural Heritage (CH) is strictly related to the Environment conditions, i.e. at the same extent of human health; so, from this point of view, they have to be considered indicators of the quality of the environment where we live. The economic damage coming from the degradation of our Cultural Heritage have to be also considered; really they are source of richness especially for those Countries with scarce natural resources such as mines, oil wells etc. The commercial exploitation of the Cultural Heritage not only brings an immediate economic benefit, but it is a source of employment that, in turn, leads to movement of money and increase of welfare. Unfortunately, a welfare increase lets the steady rise in consumption goods and energy, influencing each other, with a synergic devastating effect bound to an increasing of visible and invisible wastes. At the same time, the quick technological development also lets an indisputable increase of pollution because generally the durability of goods is considered not needed. Luckily most people, being the decrease in the quality of health evident, feel that welfare is only apparent and begin to ask the industry a "green manufacturing" and to themselves a proper waste disposal. As a matter of fact, the statement "Our future can only be ensured by eliminating waste and clean energy" has become common to hear and, hopefully, lead to behaviour that can reverse or at least flatten the growing trend of pollution.

Multivariate analysis and chemometry

As above said, environmental conditions play a main role on health of humans and of CH; so, the monitoring of pollution of both micro- and macro-environment is the main key in their safeguard. On such bases, a correct diagnostic on CH, as well as the successive conservative interventions, must take into account their oneness so requiring a complex analytical itinere, overall in the sampling phase, and also in this case, the treatment of a huge mole of data.

It is evident that, in such cases, univariate methods cannot ensure significant information because requiring an almost impossible work; so, the use of advanced statistical methods could be imperative when approaching any analytical itinere concerning Environment and CH.

Chemometry was born in order to solve problems bound to industrial processes with the goal of economic advantages that quickly have speeded up their spreading; the same advantages can be attained by their employ in CH protection. As a fact starting from the Sampling Design, passing to the process optimization and ending with a quick and reliable control, a quality increase and a cost decrease can be obtained.

As in the previous editions, this book presents some contributions to the fifth edition of our/your biannual International Meeting.

Not always chemometric or multivariate treatment are used in the researches presented in the abstracts because, unfortunately, their use is not yet so wide even if schools of chemometry are increasing worldwide (we also held our third edition in parallel with the Meeting)

Chemometry will be surely more and more usual in future, already starting from all actual young researchers but very often, when I invite some colleagues to present her/his research at our conference I obtain such reply: I am unable to use chemometry. I always stress the need of cooperation of chemometricians that, in turn, often never treated data on Environment and CH, with all the other figures involved in the environment and CH protection (theorists, researchers, professors, experts, technicians, archaeologists, restorers ...), but most of them do not agree. Further, I stress the importance of the cooperation in order to explore the problem from all the really big different points of view of the different figures; thus also the discussion of the problem lies in the topic of the Meeting, i.e. is "multivariate".

As in the previous edition, I summarize: Principal Components 1 of the conference is to favour the meeting of researchers, experts and so on of chemometrics applied to Environment (environmetrics [2]) and Cultural Heritage (cultherimetrics [3]); so, at this aim I suggest to all the participants to carefully read this "Abstract Book" looking for cooperation in international projects. Researchers using univariate methods or theoretical chemometry are welcome because surely looking for cooperation; may be that chemometricians look for juicy dataset while all the other will be happy to avoid the very hard evaluation of their data. Last, but not in importance, don't forget that chemometry [4] is today "under" any standard research, calibration, regression and data analysis; so, get yourself in discussion.

Acknowledgements

First of all I (fig. 1) like to thank all the authors for their participation at the Meeting and for following rules and Referee's suggestions in the preparation of their Abstracts. I hope that my opinion on this "Proceeding Book" is shared: apart of the high scientific content, it looks very nice and, even if in only 2 pages, each research is almost fully outlined.

A special thank is due to the, mainly young, Organizing Committee, for their contribute for a successful result of the present Conference, in particular to PhD Susanne H. Plattner.

I warmly thank the Scientific Committee for their time, stolen away from institutional activities, for divulging the Conference event.

A particular thank is due to Prof. Richard Brereton, Dr. Riccardo Leardi and Dr Marco Calderisi for the free teaching for the "Multivariate Analysis Course, School for Novices", held in parallel with the Meeting.

I cannot avoid to cite PhD Mariapia Sammartino, her multivariate contribution in all the editions has been essential.

I will wait for all of you and lots of your friends and colleagues in the next Meeting.



Fig. 1; The Coordinator, Dr. Giovanni Visco, Appointed Professor for Chemometrics at Rome University

Giovanni Visco

References

- 1) Donald D. Hester, Book Reviews of: Irwin Friend, James R. Longstreet, Morris Mendelson, Ervin Miller, Arleigh P. Hess Jr; Investment Banking and the New Issues Market, *The American Economic Review*, 58(4) (1968), 1023-1024
- 2) The term 'environmetrics' was first introduced in 1971 by Philip Cox in a proposal. submitted to the US National Science Foundation, S. Hunter, Environmetrics: An Emerging Science, in *Environmental Statistics*, G.P. Patil, C.R. Rao Ed. (1994) ISBN: 978-0-444-89803-6
- 3) G. Visco, Preface of M.J. special issue, *Microchem. J.*, 88(2) (2008) 95-96
- 4) G. Visco, What lies behind the Chemometry name?, <http://www.cma4ch.org/chemo/metrics/chemom/mslide2.html> and [mslide3.html](http://www.cma4ch.org/chemo/metrics/chemom/mslide3.html) at may 2014