Neutrosophic Sets and Systems, {Special Issue: Neutrosophic and Plithogenic Approaches in Data Science and Multivariate Analysis: Contributions from the IX Ibero-American Biometry Meeting"}, Vol. 89, 2025

It is both an honor and a pleasure to present this special issue, "Neutrosophic and Plithogenic Approaches in Data Science and Multivariate Analysis: Contributions from the IX Ibero-American Biometry Meeting." This volume brings together a selection of the most outstanding works related to neutrosophic approaches presented at the conference—an important scientific event held in the vibrant city of Quito, Ecuador, which brought together over 250 experts from 13 countries, including Spain, Portugal, the United States, Colombia, Mexico, Argentina, and Chile, during its productive sessions on July 8–9, 2025.

NSS **Editorial Board**

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The resounding success of this meeting was made possible thanks to the fruitful collaboration between the State University of Milagro (UNEMI) of Ecuador and the prestigious University of Salamanca (USAL) of Spain—both institutions deeply committed to advancing knowledge and cutting-edge research.

We are living in an era defined by data. The ability to analyze and interpret large volumes of complex information has become a cornerstone of scientific and technological progress. In this context, neutrosophic and plithogenic approaches emerge as powerful logical and mathematical tools.

We were honored to have among us the creator of this theory, Professor Florentin Smarandache, whose presence reinforced the congress's commitment to advancing Neutrosophic Statistics as an emerging methodology for modeling uncertainty. The contributions featured in this special issue demonstrate the strength of these methods across various fields, including biometry, bioinformatics, public health, education, and economics.

One of the most stimulating discussions in data analysis today concerns the relationship between classical statistics and artificial intelligence (AI). Far from being antagonistic disciplines, we are witnessing an era of convergence. Statistics provides the mathematical rigor needed to understand uncertainty, while AI offers unprecedented computational power. This dialogue was brilliantly illustrated in the keynote lecture by Professor Juan Manuel Corchado, Rector of the University of Salamanca and a global leader in the field, who spoke on "Generative AI and Data Science as Engines of Boundless Innovation."

His perspective echoes the words of Miguel de Unamuno, one of the most emblematic rectors of the same university: "True science teaches, above all, to doubt and to be ignorant." It is precisely in that scientific doubt that the need arises for the creation of new methods like those presented in this issue.

The articles in this volume stand at the intersection of these worlds, showing how robust statistical principles underpin new AI algorithms, and how AI, in turn, enhances traditional data analysis. Furthermore, the conference built crucial bridges with the productive sector, highlighting the direct applicability of these advances to industry.

We extend our deepest gratitude to the authors for their valuable contributions, to the reviewers for their rigorous work, and to the organizing and scientific committees. Their joint efforts have been essential to the success of this initiative.

We trust this collection will serve as both a source of inspiration and a valuable reference, and that, in honoring Unamuno's inquisitive spirit, it will foster new collaborations and breakthroughs in the exciting field of Ibero-American data analysis.

This special issue has been made possible thanks to the leadership and expertise of a distinguished team of guest editors who represent Ibero-American academic excellence in the field of statistics and multivariate data analysis. Dra. Purificación Galindo Villardón, Full Professor at the University of Salamanca (Spain) and internationally recognized for her pioneering contributions in multivariate análisis, biplot methodology and related thecniqques, leads this editorial team. With over three decades of experience in applied statistical research and having served as Vice-Rector for Health Sciences Quality Assurance and Academic Policy, at the University of Salamanca, Dra. Galindo Villardón brings a unique perspective on advanced statistical methods and their application to the life sciences.

Joining her is Dra. Purificación Vicente Galindo, also from the University of Salamanca, who contributes her expertise in data analysis related to quality of life and statistical methods applied to biomedical research.

The team is further enriched by the participation of Dr. Fabricio Guevara Viejó, Rector of the State University of Milagro (UNEMI) in Ecuador, who offers an administrative and university

management perspective combined with a strong background in multivariate statistics. Dr. Guevara, who holds a PhD in Management and is a PhD candidate in Statistics at the University of Salamanca, has been instrumental in strengthening academic ties between Ecuador and Spain, promoting collaborative research in data analysis and institutional theory. His leadership at UNEMI has been key in positioning the university as a benchmark in Ecuadorian higher education.

From Chile, Dr. Marcelo Ruiz Toledo, Vice-Rector for Administration and Finance at Universidad Bernardo O'Higgins and Ph.D. in Applied Multivariate Statistics with international distinction from the University of Salamanca, brings extensive expertise in institutional financial management, strategic planning, and statistical analysis applied to higher education. His research on mixed financing policies and the development of university performance indicators has provided key insights into the structural and governance challenges facing higher education systems in Latin America. Dr. Ruiz Toledo's work has contributed significantly to the formulation of evidence-based strategies aimed at improving institutional efficiency and educational quality across the region.

Finally, Dr. Omar Ruiz Barzola, from the Escuela Superior Politécnica del Litoral (ESPOL) in Ecuador, completes this multidisciplinary team with his expertise in applied multivariate statistics and experimental design. Holding a PhD in Statistics and Optimization from the Polytechnic University of Valencia, Dr. Ruiz Barzola has dedicated over two decades to the application of statistical methods in the life and health sciences, significantly contributing to the development of applied statistics in Ecuador.

This geographical and thematic diversity—spanning from Spain to Ecuador and Chile—reflects the truly Ibero-American spirit of this special issue, where academic collaboration transcends borders to address contemporary challenges in data analysis and applied statistics. Each guest editor has played a crucial role not only in the selection and review of manuscripts, but also in the thematic conceptualization of the issue, ensuring that the contributions presented represent the most advanced approaches in neutrosophic and plithogenic methods applied to data science and multivariate analysis.

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