



ICSTA
2024

**PROCEEDINGS OF THE 6TH
INTERNATIONAL CONFERENCE ON
STATISTICS: THEORY AND APPLICATIONS
(ICSTA 2024)**

August 19 - 21, 2024 | Barcelona, Spain

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WELCOME MESSAGE FROM THE CONFERENCE CHAIR

On behalf of the International Academy of Science, Engineering and Technology (International ASET Inc.), the organizing committee would like to welcome you to the 6th International Conference on Statistics: Theory and Applications (ICSTA 2024).

The goal of ICSTA 2024 is to gather scholars from all over the world to present advances in the relevant fields and to foster an environment conducive to exchanging ideas and information. This conference will also provide an ideal environment to develop new collaborations and meet experts on the fundamentals, applications, and products of the mentioned fields.

In the sixth meeting of this conference, five keynote speakers will share their expertise with the aim of exposing participants to a wide spectrum of applications, and to foster crosspollination of ideas and develop new research interests. In addition, approximately 38 papers will be presented from professors, students, and researchers across the world.

We thank you for your participation and contribution to the 6th International Conference on Statistics: Theory and Applications (ICSTA 2024). We wish you a very successful and enjoyable experience.

Dr. Noelle Samia
Northwestern University, USA
Conference Chair
ICSTA 2024

Dr. Dirk Husmeier
The University of Glasgow, UK
Conference Co-Chair
ICSTA 2024

ABOUT ICSTA 2024

The 6th International Conference on Statistics: Theory and Applications (ICSTA 2024) aims to become the leading annual conference in fields related to Statistics: Theory and Applications. The goal of ICSTA 2024 is to gather scholars from all over the world to present advances in the fields related to Statistics: Theory and Applications and to foster an environment conducive to exchanging ideas and information. This conference will also provide an ideal environment to develop new collaborations and meet experts on the fundamentals, applications, and products of the mentioned fields.

ICSTA is an international conference will be held yearly. This conference focus on all aspects Statistics: Theory and Applications. ICSTA Will be held this year in Brunel University, London, United Kingdom.

ICSTA is an acronym for **I**nternational , **S**tatistics: **T**heory and **A**pplications.

- The proceedings are published in Ottawa, Canada.
- All papers were peer-reviewed
- The congress proceedings is published under an ISSN and ISBN number
- Each paper is assigned a unique DOI number by [Crossref](#)
- The conference proceedings are indexed by [Scopus](#) and [Google Scholar](#)
- The proceedings is permanently archived in [Portico](#) (one of the largest community-supported digital archives in the world)

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SCIENTIFIC COMMITTEE

We would like to thank the following for accepting to act as a member of the Scientific Committee for the ICSTA 2024



Dr. Noelle Samia

Northwestern University, USA
Conference Chair



Dr. Dirk Husmeier

The University of Glasgow, UK
Conference Co-Chair



Dr. Jürgen Pilz

University of Klagenfurt, Austria
local Committee Member

Scientific Committee Members

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- **Dr. Dalia Chakrabarty**, Loughborough University, UK
- **Dr. Yogendra Chaubey**, Concordia University, Canada
- **Dr. Michael Evans**, University of Toronto, Canada
- **Dr. Faming Liang**, Purdue University, USA
- **Dr. Hosam M. Mahmoud**, George Washington University, USA
- **Dr. Azizur Rahman**, Charles Sturt University, Australia

KEYNOTE SPEAKERS

The keynote information for the International 6th International Conference on Statistics: Theory and Applications (ICSTA 2024) is as follows:

Keynote Speakers



Dr. Michael Evans
University of Toronto,
Canada



Dr. Christopher Franck
Virginia Tech, USA



Dr. Marco Grzegorzczuk
University of Groningen,
Netherland



Dr. Hosam M. Mahmoud
George Washington University,
USA



Dr. Min-ge Xie
Rutgers University, USA

ICSTA 2024 KEYNOTE SPEAKER



Titles: The Concept of Statistical Evidence: Historical Roots and Current Developments

Dr. Michael Evans University of Toronto, Canada

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Michael Evans is a Professor of Statistics at the University of Toronto. He received his Ph.D. from the University of Toronto in 1977 and has been employed there ever since with leaves spent at Stanford University and Carnegie Mellon University. He is a Fellow of the American Statistical Association, he served as Chair of the Department of Statistics 1992-97, Interim Chair 2022-23 and as President of the Statistical Society of Canada 2013-2014. He has served in a number of editorial capacities as follows: Associate Editor of JASA Theory and Methods 1991-2005, Associate Editor of the Canadian Journal of Statistics 1999-2006 and 2017-present, Associate Editor of the journal Bayesian Analysis 2005-2015, and as an Editor 2015-2021, Subject matter Editor for the online journal FACETS (current) and Associate Editor of the New England Journal of Statistics in Data Science (current).

Michael Evans' research has been concerned with multivariate statistical methodology, computational statistics, and the foundations of statistics. A current focus of research is the development of a theory of inference based upon an explicit definition of how to measure statistical evidence and the development of tools to deal with criticisms of statistical methodology associated with its inherent subjectivity. He has authored, or coauthored, numerous research papers as well as the books Approximating Integrals via Monte Carlo and Deterministic Methods (with T. Swartz) published by Oxford in 2000, Probability and Statistics: The Science of Uncertainty (with J. Rosenthal) published by W.H. Freeman in 2004 and 2010 and Measuring Statistical Evidence Using Relative Belief published by CRC Press/Chapman and Hall in 2015.

ICSTA 2024 KEYNOTE SPEAKERS



Titles: The Responsible Emboldening Of Probability Forecasts

Dr. Christopher Franck, Virginia Tech, USA

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Chris Franck is an Associate Professor in the Department of Statistics at Virginia Tech. He is an application-oriented methodologist who focuses on statistical problems in health applications, behavioral economics, probabilistic forecasting, bioinformatics, and other areas. His work includes Bayesian statistical methodologies that can be implemented automatically and/or with objective prior information, Model selection and averaging approaches and practical methods by which to assess their sensitivities, and finally, in cases where historical data is inadequate and contemporary information is available, he develops Bayesian methods that allow researchers to formally incorporate subjective information into their analyses and predictions.



Titles: The Flexibility of Gaussian Bayesian Networks

Dr. Marco Grzegorzczuk University of Groningen, Netherland

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Marco Grzegorzczuk is Associate Professor for Computational Statistics at the Bernoulli Institute of Groningen University (NL). He received his PhD in Statistics from the TU Dortmund University in Germany in 2006. Since then his main research focus has been on Bayesian network structure learning with a special focus on learning gene regulatory pathways and protein activation cascades from molecular data. He is Associate Editor of the journals 'Computational Statistics', 'The Journal of Applied Statistics' and 'Statistica Neerlandica'. Also he is involved in the Statistical Modelling Society (treasurer) and the International Biometric Society (representative council).

ICSTA 2024 KEYNOTE SPEAKERS



Titles: Recursive Trees with Generalized Affinities

Dr. Hosam M. Mahmoud George Washington University, USA

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Titles: Repro Samples Method for Addressing Irregular Inference Problems and for Unraveling Machine Learning Blackboxess

Dr. Min-ge Xie, Rutgers University, USA

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Min-ge Xie, PhD is a Distinguished Professor at Rutgers, The State University of New Jersey. Dr. Xie received his PhD in Statistics from University of Illinois at Urbana-Champaign and his BS in Mathematics from University of Science and Technology of China. He is the current Editor of The American Statistician and a co-founding Editor-in-Chief of The New England Journal of Statistics in Data Science. He is a fellow of ASA, IMS, and an elected member of ISI. His research interests include theoretical foundations of statistical inference and data science, fusion learning, finite and large sample theories, parametric and nonparametric methods. He is the Director of the Rutgers Office of Statistical Consulting and has a rich interdisciplinary research experiences in collaborating with computer scientists, engineers, biomedical researchers, and scientists in other fields.

LIST OF PAPERS

The following papers were presented at the 6th International Conference ON STATISTICS: THEORY AND APPLICATIONS (ICSTA 2024).

Applied Statistics

Factors Influencing Business Survival: A Survival Analysis in the Albanian Business Landscape

Authors: Lule Basha, Eralda Gjika, Ornela Gordani

Adapting a Correlated Random Effects Method to Handle Ignorable Missingness in the Predictors and Non-ignorable Missingness in the Response

Authors: Hanadi Alzahrani, Benn Macdonald, Caroline Haig, John Cleland

Analyzing Dependencies in the Electric Vehicle Sector Using the Canonical Vine Copula

Authors: Pankaj kumar, Vivek Vijay

Bayesian Inference, Emulation and Deep Learning in Cardiac Mechanics

Authors: Yuzhang Ge, Arash Rabbani, Hao Gao and Dirk Husmeier

Bayesian Statistics Applied to the Recovery of Copper and Cobalt-Bearing Ores: Establishment of the Probability Laws of Leaching Parameters

Authors: Bienvenu Mbuya, Elvis Fosso-Kankeu, Jan Bongaerts and Antoine F. Mulaba-Bafubiandi

Statistical Models with Interactions: Tools to Improve Empirical Analyses

Authors: Svitlana Shvydka, Volodimir Sarabeev, Mária Ždímalová

Evaluation of Biostatistics Contents in ChatGPT: A Descriptive Study

Authors: Arzu Baygöl Eden, Alev Bakır Kayı, Mert Veznikli

LIST OF PAPERS

Applied Statistics

Bahadur Type Representation and Berry-Esseen bound for Sample Quantiles Under Weak Dependence

Authors: Bahaeddine Taoufik, Lahcen Douge

Statistical Analysis on Factors Affecting Journal's Impact Factors

Authors: Forest Ho-Chen

Exploring Universal Kriging Modelling for Functional Greenness Data Captured by Digital Webcams

Authors: Raziye Hosseini

Mutual Information Based Correlation Analysis of Health-Related Multiple Air Pollutants

Authors: Huawei Han, Wesley S. Burr

Development of LSTM Based Models for Air Pollutant-Related Public Health Effects

Authors: Huawei Han, Wesley S. Burr

Large Language Model application and tuning for product analysis: a preliminary investigation

Authors: Elena Barzizza, Nicolò Biasetton, Giorgio Caligiuri, Daniele Pennisi, Luigi Salmaso

A Novel Particle Picking Pipeline for Cryo-EM Using Semantic Segmentation and Conditional Random Field

Authors: Szu-Chi Chung, Po-Cheng Chou

LIST OF PAPERS

Applied Statistics

Challenges in High Dimensional Change Point Analysis and Advanced Approaches

Authors: Shrog Albalawi, Reza Drikvandi

Exploring the Time Dynamics of Fire Sequences: A Case Study in the Basilicata Region (Southern Italy)

Authors: Luciano Telesca, Angelo Aromando, Rosa Lasaponara

Power BI Plots for Skewness and CV of Small Samples

Authors: Huang, Li-Fei

Enhancing Security in Remote Laboratory Environments: A Layered Approach

Authors: Ali Al Maqousi

Cluster-based Customer Satisfaction Analysis

Authors: Elena Barzizza, Riccardo Ceccato, Luigi Salmaso

Model-Based Clustering Analysis for Multivariate Longitudinal Data via Mixtures of Matrix-Variate t-distributions

Authors: Farzane Ahmadi, Elham Faghihzadeh

Impact of Heating System Conversion on Peak Electricity Demand

Authors: Sy Keprissié John Asaph Sanogo

To Develop The Test To Evaluate The Multivariate Distributions That Are Part Of The Normal Inverse Gaussian Class In Terms Of Fit Quality

Authors: Mehmet Siddik Cadirci

LIST OF PAPERS

Applied Statistics

[An Analytical Expression for the Quotient of Odds Ratio with Applications to Cardiovascular Disease Risk](#)

Authors: Golnaz Shahtahmassebi, Jose Maria Sarabia

[Tricube Exponential Distribution](#)

Authors: Shawkat Alkhazaleh, Rawad Aloqdeh, Firas Al-Marashdeh

[Enhancing Gene Expression Data Analysis through SVM-Based Recursive Cluster Elimination and Weighted Center Approaches](#)

Authors: Malik Yousef, Nurten Bulut, Burcu Bakir Gungor, Bahjat F. Qaqish

LIST OF PAPERS

Computational Statistics

Physics-informed deep learning based on the finite difference method for efficient and accurate numerical solution of partial differential equations

Authors: Jiaming Zhang, David Dalton, Hao Gao, Dirk Husmeier

The Statistical Assessment of Variables Affecting Conservation Condition for Historic Houses

Authors: Hatice Ayşegül Demir, Nihan Bulut, Mine Hamamcıoğlu Turan

On the Estimation of Joint Density Functions via Copulas

Authors: Serge B. Provost, Yishan Zang

Study Over Some Approaches in Formulating Optimal Designs

Authors: Akram Mahmoudi, Saumen Mandal

LIST OF PAPERS

Poster Session

Comparison Of Methods To Estimate The Average Treatment Effect In Longitudinal Studies When Model Residuals Are Not Normally Distributed

Authors: Anna Morra, Maya Marintcheva-Petrova, Sonia Amodio

Assessment of River Water Quality using Survival Analysis

Authors: Maria Victória Calderero, Thiago Ramires, Luiz Ricardo Nakamura

Response Times Of Electronic Spray Controllers As A Function Of Speed Changes

Authors: Pedro Luiz Bacoccina Kaizer, Luiz Ricardo Nakamura

Noise Reduced Common PCA for High-Dimensional, Low-Sample Size Multi-View Data

Authors: Hiroki Hasegawa, Homura Kawamura, Ryota Shin, Kazuyoshi Yata, Yukihiro Okada, Jun Kunitatsu

Recent Developments In Machine Learning Techniques For Handover Optimization In 5G

Authors: Elena Barzizza, Luigi Salmaso, Francesco Trolese

Decision Tree Models Applied in Sugarcane Cultivation

Authors: Geovana Toledo Zorzi, Thiago Ramires, Luiz Ricardo Nakamura

Nonstationarity of the Hemodynamic Response Function in Event-Related Functional Magnetic Resonance Imaging

Author: Friederike Preusse

James Stein Shrinkage for Perturbed Covariance Matrices

Author: Greeshma Balabhadra

SPONSORS

International ASET Inc. would like to thank the following sponsors for their support of ICSTA 2024:



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ICSTA 2025

The 7th International Conference of On Statistics: Theory and Applications (ICSTA 2025) will be held on August, 2025 | Paris, France.



For inquiries and to obtain further information on the conferences, please visit our website please visit our [website](https://www.2025.icsta.net)

You can also email info@icsta.net or call us at: +1-613-834-9999

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ETHICS & MALPRACTICE

At International ASET Inc., we take matters that relate to ethics in publishing very seriously. We believe that the peer-review publication process is a vital building block of academia, and its integrity must be maintained at all costs, which is why every article will be peer-reviewed by several experts in the field. Under peer-review, experts in the related fields are required to provide opinions and comments on the improvements of the submissions.

We are proud of our efforts towards abiding by the guidelines of ethics, integrity, and high standards in publishing.

Following are the ethics guidelines set by the organizers for the authors and the reviewers of the conference:

Scientific Committees

Scientific committees consisting of experts in the fields are established. The committees oversee the peer-review and publication process. To see the scientific committee members, please follow the link: [Scientific Committee](#)

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One or more reviewer, scientific committee member, or chair, (internal or external), are responsible for evaluating the relevance of the submitted manuscripts to the proceedings, technical and scientific merit, originally, and impact. These evaluations are to be carried out regardless of ethnicity, religion, gender, sexual orientation, political beliefs, and institutions. Successive to peer-review, the Chair has full authority and is solely responsible for the published content and the process thereof.

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Promptness

Reviewers should promptly notify the chair(s) if they are unable or unqualified to carry out their reviewing duties. Reviewers should do their best to provide the reviews to the chair(s) as promptly as possible, and within the designated time-frame.

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Authors

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The paper being submitted for the proceedings should be based on clear objective, discussion, and references. The findings, data, and the arguments being used in the paper should be accurate. It is author's responsibility to guarantee the authenticity of the data in the paper.

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Only persons who have significantly contributed to the work and the manuscript can be named authors on a paper. These contributions include the idea/concept, design, experiments, evaluation, analysis, drafting or revision of the manuscript, and others. Authors must all have agreed to be named as such and for the manuscript to be submitted. Anyone who has contributed based on the above, but the level of contribution is not significant, may appear in the acknowledgement section of the manuscript.

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Schedule:

This conference proceeding accompanies the conference, meaning a new proceedings will be published every year for the corresponding annual conference of this series.

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