

## PROCEEDINGS OF THE 4TH INTERNATIONAL CONFERENCE ON STATISTICS: THEORY AND APPLICATIONS (ICSTA'22)

July 28 - 30, 2022 | Prague, Czech Republic

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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 4<sup>th</sup> International Conference on Statistics: Theory and Applications (ICSTA'22).

The goal of ICSTA'22 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 fourth meeting of this conference, two Plenary Speakers and 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 42 papers will be presented from professors, students, and researchers across the world.

We thank you for your participation and contribution to the 4<sup>th</sup> International Conference on Statistics: Theory and Applications (ICSTA'22). We wish you a very successful and enjoyable experience.

**Dr. Noelle Samia Northwestern University, USA** *Conference Chair ICSTA'22* 

Dr. Dirk Husmeier The University of Glasgow, UK Conference Co-Chair ICSTA'22

# **ABOUT ICSTA'22**

The 4<sup>th</sup> International Conference on Statistics: Theory and Applications (ICSTA'22) aims to become the leading annual conference in fields related to Statistics: Theory and Applications. The goal of ICSTA'22 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 Prague, Czech Republic.

**ICSTA** is an acronym for International , **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 <u>Crossref</u>
- The conference proceedings is indexed by Google Scholar
- The proceedings is permanently archived in <u>Portico</u> (one of the largest community-supported digital archives in the world)





## **SCIENTIFIC COMMITTEE**

We would like to thank the following for accepting to act as a member of the Scientific Committee for the ICSTA'22 Conference:



**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**

- Dr. Mylène Bédard, University of Montreal, Canada
- Dr. Dalia Chakrabarty, Loughborough University, UK
- Dr. Yogendra Chaubey, Concordia University, Canada
- Dr. Michael Evans, University of Toronto, Canada
- Dr. Dirk Husmeier, University of Glasgow, UK
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- Dr. Krzysztof Podgórski, Lund University, Sweden
- Dr. Azizur Rahman, Charles Sturt University, Australia
- Dr. Noelle Samia, Northwestern University, USA

# **PLENARY & KEYNOTE SPEAKERS**

The keynote information for the International 4<sup>th</sup> International Conference on Statistics: Theory and Applications (ICSTA'22) is as follows:

### **Plenary Speakers**



Dr. Jianqing Fan Princeton University, USA



<u>Dr. Yi Li</u> University of Michigan, USA

### **Keynote Speakers**



Dr. Matias D. Cattaneo University of Toronto, Canada



Dr. Christopher Hans The Ohio State University, USA



Dr. Kimberly Sellers Georgetown University, USA



Dr. Jianjun Shi Georgia Institute of Technology, USA



Dr. Richard O. Sinnott The University of Melbourne, Australia

### **ICSTA'22 PLENARY LECTURES**



**Titles:** Structural Deep Learning in Conditional Asset Pricing **Dr. Jianqing Fan, Princeton University, USA** 

### **View Abstract**

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Jianqing Fan is Frederick L. Moore Professor, Princeton University. After receiving his Ph.D. from the University of California at Berkeley, he has been appointed as professor at the University of North Carolina at Chapel Hill (1989-2003), the University of California at Los Angeles (1997-2000), and professor at the Princeton University (2003–). He was the past president of the Institute of Mathematical Statistics and International Chinese Statistical Association. For more information please visit:

https://2022.icsta.net/keynote-speakers/



**Titles:** Machine Learning for Precision Medicine: Model Selection, Estimation, and Inference **Dr. Yi Li, University of Michigan, USA** 

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Yi Li is a Professor of Biostatistics and Professor of Global Public Health at the University of Michigan (UM). After receiving a Ph.D. from the UM in 1999, he was an Assistant Professor and Associate Professor at the Harvard School of Public Health for 12 years before rejoining the UM to lead a major research center in 2011. He has made important contributions in a wide range of statistical areas, including data science, survival analysis, high-dimensional data analysis, measurement error problems, spatial data analysis, random-effects models, clinical trial design, and high-dimensional data analysis. For more information please visit: https://2022.icsta.net/keynote-speakers/

### **ICSTA'22 KEYNOTE LECTURES**



Titles: On Binscatter Dr. Matias D. Cattaneo, Princeton University, USA

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Matias D. Cattaneo is a Professor of Operations Research and Financial Engineering (ORFE) at Princeton University, where he is also an Associated Faculty in the Department of Economics, the Center for Statistics and Machine Learning (CSML), and the Program in Latin American Studies (PLAS). His research spans econometrics, statistics, data science and decision science, with particular interests in program evaluation and causal inference. Most of his work is interdisciplinary and motivated by quantitative problems in the social, behavioral, and biomedical sciences. As part of his main research agenda, he has developed novel semi-/non-parametric, high-dimensional, and machine learning inference procedures with demonstrably superior robustness to tuning parameter and other implementation choices.

For more information Please visit: <u>https://2022.icsta.net/keynote-speakers/</u>



**Titles:** Prior Dependence in L1-regularized Bayesian Regression

Dr. Christopher Hans, The Ohio State University, USA

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Christopher M. Hans is an Associate Professor in the Department of Statistics at The Ohio State University, where he has been a faculty member since receiving his Ph.D. in Statistics and Decision Sciences from Duke University in 2005. His research has focused on aspects of Bayesian regression modeling, including computational methods for Bayesian model averaging with many predictors. For more information Please visit:

https://2022.icsta.net/keynote-speakers/

### **ICSTA'22 KEYNOTE LECTURES**



**Titles:** Dispersed Methods for Handling Dispersed Count Data

Dr. Kimberly Sellers, Georgetown University, USA

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Kimberly F. Sellers, Ph.D. is a Professor of Mathematics and Statistics, specializing in Statistics at Georgetown University in Washington, DC; and a Principal Researcher with the Center for Statistical Research and Methodology Division of the U.S. Census Bureau. Prof. Sellers completed her BS and MA degrees in Mathematics at the University of Maryland College Park, and then obtained her PhD in Mathematical Statistics at The George Washington University. Her research areas of interest and expertise are in generalized statistical methods involving count data that contain data dispersion; and in image analysis techniques, particularly low-level analyses including preprocessing, normalization, feature detection, and alignment. For more information Please visit:

https://2022.icsta.net/keynote-speakers



**Titles:** Machine Learning Enabled Quality Improvement in Smart Manufacturing Systems

Dr. Jianjun Shi, Georgia Institute of Technology, USA

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Dr. Jianjun Shi is the Carolyn J. Stewart Chair and Professor in the School of Industrial and Systems Engineering at Georgia Institute of Technology.

Dr. Shi's research focuses on data enabled manufacturing, and system informatics and control. His methodologies integrate system informatics, advanced statistics, and control theory, and fuse engineering system models with data science methods for design and operational improvements of manufacturing systems.

For more information Please visit:

https://2022.icsta.net/keynote-speakers

### **ICSTA'22 KEYNOTE LECTURE**



Titles: A Decade of Lessons Learned in Supporting a National Big Data Platform for Urban Research Dr. Richard O. Sinnott, The University of Melbourne, Australia

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Professor Richard O. Sinnott is Professor of Applied Computing Systems at the University of Melbourne. He has been technical lead on a multitude of large-scale international projects with emphasis on big data and security worth over \$500m. This includes numerous projects in the defence, intelligence and biomedical domains. He has over 450 peer-reviewed publications across a range of computing and application-specific domains.

The following papers were presented at the 4th International Conference of Energy Harvesting, Storage, and Transfer (ICSTA'22).

### **Applied Statistics**

Jackknife Empirical Likelihood Methods for Testing the Distributional Symmetry Authors: Brian Pidgeon, Yichuan Zhao

Leveraged Study Design for Identifying Dominant Causes of Variation Authors: Mahsa Panahi, Stefan H. Steiner, Jeroen de Mast

<u>Clustering and Multidimensional Scaling for Individual Difference Extraction</u> Author: Mika Sato-Ilic

On the Estimation of Empirical Copulas and Joint Densities Author: Yishan Zang

<u>A New Multivariate Dispersion Control Chart</u> Authors: Su-Fen Yang, Yen-Ling Liu

An efficient Skip Lot Sampling Plan by Variables Based on Taguchi Capability Index Sciences: An Open Problem Author: Nabil EL FARME

A Semiparametric Transition Model for Lifetime Drift of Discrete Electrical Parameters in Semiconductor Devices Authors: Lukas Sommeregger, Horst Lewitschnig

Development of a Multi Pollutant Model to Assess Air Pollution Association with Human Health Effects Authors: Shannon Jarvis, Wesley Burr

Precision Agriculture: Herbicide Reduction with AI Models Authors: Renan Andrade, Thiago Ramires

### **Statistical Methodology**

A Structural Learning Method for Graphical Models Authors: Benjamin Szili, Mu Niu, Tereza Neocleous

New Statistical Methods For Association Studies And Genomic Predictio Authors: Charles-Elie Rabier, Céline Delmas

<u>A Unified Framework for Principal Subspace Analysis from the Hamiltonian</u> <u>Viewpoint</u> Author: Ke Yu

<u>Understanding the Population Structure Correction Regression</u> Authors: The Tien Mai , Pierre Alquier

Relative Belief and Combining Evidence Author: Michael Evans

Mutual Information in the Analysis of Trust Gains from Subsets of Information Authors: Ronit Bustin and Claudia V. Goldman

A Time Series Analysis Using Shannon Index of Annual Domestic Crop Production and Area Planted in Jamaica from 2007 to 2021 Authors: Videsh Jagroo, Annika Minott, Lisa James

Comparison Of Two Mean Vectors Under Differential Privacy For High-Dimensional Data Authors: Caizhu Huang, Di Wang, Yan Hu, Nicola Sartori

Common Misconceptions and Misunderstandings in Magic Cut-Off for Significance: P-Value

Authors: Arzu Baygül Eden, Neslihan Gokmen Inan

On Consistent Hypothesis Testing In General Hilbert Spaces Authors: Daniel Gaigall

### **Medical Statistics**

**Statistical Inference for Optimisation of Drug Delivery from Stents** 

Authors: L. Mihaela Paun, André Fensterseifer Schmidt, Sean McGinty, and Dirk Husmeier

Association of E-Cigarette Use during Pregnancy with Adverse Birth Outcomes: A Meta-Analysis Authors: Zhilin Ren, Yi Yao, Jiyan Ma

Myocardial Perfusion Classification Using A Markov Random Field Constrained Gaussian Mixture Model

Authors: Yalei Yang, Hao Gao, Colin Berry, Aleksandra Radjenovic, Dirk Husmeier

Identifying Safety-Vaccine Association for COVID-19 Vaccines from VAERS Author: Jianping Sun

Temporal Extrapolation of Heart Wall Segmentation in Cardiac Magnetic Resonance Images via Pixel Tracking Authors: Arash Rabbani, Hao Gao, Dirk Husmeier

Resolution Enhancement of Placenta Histological Images Using Deep Learning Authors: Arash Rabbani, Masoud Babaei

### **Time-Series Analysis**

Phase Distributions of Complex Multitaper Transfer Function Estimates Authors: Skye Griffith, Glen Takahara, Wesley S. Burr

Multifractal Analysis of MODIS Terra Satellite Time Series of Italian Urban Forests

Authors: Luciano Telesca, Nicodemo Abate, Farid Faridani, Carmen Fattore, Michele Lovallo, Rosa Lasaponara

Unsupervised Classification of Categorical Time Series through Innovative Distances

Authors: Ángel López-Oriona, José A. Vilar, Pierpaolo D'Urso

<u>Risk Measure Based on ARMA-TGARCH-GED-Copula Model</u> Authors: Kun Wang, Wanrong Li

Longitudinal Beta GEE Modelling for Analysing Global and Regional Prevalence of Anaemia in Women

Authors: Eliana Ibrahimi, Jona Shkurti, Aldiona Kërri, Thao Mai Phuong Tran

Effect of Monthly Mean Temperature on Accidental Mortality in the Elderly: A Time-Series Analysis in Tokyo, Kyoto, Sapporo, Japan Authors: Masao Kanamori

### **Computational Statistics**

Exploring the Factors Which Impact the Customers' Online Purchase Intentions Authors: Isidora Albijanić, Milica Milošević, Milica Maričić, Veljko Jeremić

Reinforcement Learning Based Optimal Adversarial Pathway Estimation Using Remotely Sensed Spectral-Terrain Data and Human Value Assessment Authors: Josef Affourtit, and Nicholas Scott

A Theoretical Formulism for Evidential Reasoning and Logic Based Bias Reduction in Geo-Intelligence Processing Author: Nicholas V. Scott

Flexible Semiparametric Kernel Estimation with Bayesian Local Bandwidths and Diagnostics for Multivariate Count Data Authors: Sobom M. SOME, Célestin C. KOKONENDJI

### **Social Statistics**

Approximate Bayesian Inference for Educational Attainment Models Authors: Shuhrah ALghamdi, Nema Dean, Ludger Evers

Jackknife Estimator Consistency for Nonlinear Mixture Authors: Rostyslav Maiboroda, Vitaliy Miroshnychenko

Combining Statistical and Rule-Based Expert Knowledge to Measure Employment Precarity

Authors: Penelope Stamou, Elena Stringli, Glykeria Stamatopoulou, Dimitrios Parsanoglou and Maria Symeonaki

# **SPONSORS**

International ASET Inc. would like to thank the following sponsors for their support of ICSTA'22:









## ICSTA'23

The 5th International Conference of On Statistics: Theory and Applications (ICSTA'23) will be held on August 03 - 05, 2023 | Brunel University, London, United Kingdom.



For inquiries and to obtain further information on the conferences, please visit our website please visit our <u>website</u> You can also email <u>info@icsta.net</u> or call us at: +1-613-834-9999



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We are pleased to announce that Avestia Publishing (a publisher of International ASET Inc.) has been approved by the <u>Committee on Publication Ethics (COPE)</u>. 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: <u>Scientific Committee</u>

#### **Equality and Decisions**

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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#### Authors

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#### Errata and Retractions

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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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