

Centro de Estatística e Aplicações Universidade de Lisboa

Divulgação CEAUL 16/2025

8 maio 2025

Seminário

CEAUL&CEMAT

Systems Learning of Single Cells

Qing Nie, Department of Mathematics, Department of Developmental and Cell Biology, NSF-Simons Center for Multiscale Cell Fate Research, University of California, Irvine, USA

21 April 2024 - 14h30 | Ciências Ulisboa, C6, Floor 4, SASLab (Room 6.4.29)

Cells make fate decisions in response to dynamic environments, and multicellular structures emerge from multiscale interplays among cells and genes in space and time. The recent single-cell genomics technology provides an unprecedented opportunity to profile cells for all their genes. While those measurements provide high-dimensional gene expression profiles for all cells, it requires fixing individual cells that lose many important spatiotemporal information. Is it possible to infer temporal relationships among cells from single or multiple snapshots? How to recover spatial interactions among cells, for example, cell-cell communication? In this talk I will present our newly developed computational tools to study cell fate in the context of single cells as a system. In particular, I will show dynamical models and machine-learning methods, with a focus on inference and analysis of transitional properties of cells and cell-cell communication using both high-dimensional single-cell and spatial transcriptomics, as well as multi-omics data for some cases. Through their applications to various complex systems in development, regeneration, and diseases, we show the discovery power of such methods in addition to identifying areas for further method development for spatiotemporal analysis of single-cell data.

More information, <u>here</u>. <u>Poster</u>.

DESTAQUE

SPE

Prémio Estatístico Júnior 2025

Prazo de candidatura: 31 maio 2025

Iniciativa promovida pela Sociedade Portuguesa de Estatística (SPE) e dirigida aos alunos dos ensinos Básico e Secundário, com o apoio do **CEAUL**.

Mais informação, <u>aqui</u>.

NOVIDADES

Statistics and Risk Management Seminar*

Everything is Connected: Space, Time, EVT, and Graph Neural Networks

Tanujit Chakraborty, Sorbonne University and Sorbonne Centre for Artificial Intelligence, Abu Dhabi and Paris

13 May 2025 | 14:00 | Zoom

We consider inference problem concerning the drift parameter in some generalized mean-reverting processes with unknown change-points in the context where the target parameter is suspected to satisfy some restrictions. We generalize some recent findings in five ways. First, the established method incorporates the uncertain prior knowledge. Second, we derive the unrestricted estimator (UE) and the restricted estimator (RE) as well as their asymptotic properties. Third, we propose a test for testing the hypothesized restrictions and we establish its asymptotic power. Fourth, we construct a class of shrinkage estimators (SEs) which includes as special cases the UE, RE, and classical SEs. Fifth, we study the relative performance of the proposed class of SEs, and we prove that James-Stein type estimators dominate the UE. Beyond such interesting findings, the additional novelty of the derived results consists in the fact that the dimensions of the proposed estimators are random. Because of that, the asymptotic power of the proposed test and the relative efficiencies do not follow from classical methods. To overcome this problem, we derive an asymptotic result which is useful in its own.

Short Bio: Tanujit Chakraborty is an Associate Professor of Statistics and Data Science at Sorbonne University and Sorbonne Centre for Artificial Intelligence (Abu Dhabi and Paris). He received his MS and Ph.D. degrees from the Indian Statistical Institute, Kolkata. His research interests include statistical learning, neural networks, time series forecasting, and health data sciences. He was also a visiting faculty member at Duke-NUS Medical School, National University of Singapore. He has served as a statistical consultant at PharmaACE Analytics, Bajaj FinServ, and ITC Limited.

*Seminar organized by the Department of Mathematics, NOVA MATH/FCT NOVA

ICRA10 International Conference on RA (Risk Analysis)

22 - 24 September 2025 | September 22 - 24 - Patras, Greece and online

Abstract submission deadline: 1 June 2025

The International Conference on Risk Analysis (ICRA10) is dedicated to advancing knowledge and fostering discussion on the latest developments in theoretical and computational models in Risk Analysis. The conference emphasizes applications across a wide range of fields, including Life Sciences, Environmental and Public Health, Economics and Finance, and the Reliability of Engineering and Biomedical Systems.

7th SHDM 7th Statistics on Health Decision Making: Epidemiology

10 - 11 July 2025 | University of Aveiro

The meeting "STATISTICS ON HEALTH DECISION MAKING" aims to promote the boosting of research and discussion of Medical Statistics. This meeting brings together clinical, academic and professional world, in a discussion forum about strategic lines of statistics in health decision making.

More information <u>here</u>.

RECORDAMOS

Seminário Estatística e Análise de Dados em Saúde com SPSS

28 maio 2025 | 19:00 - 20:00 | Online | Gratuito

Neste seminário, de eminário de <u>Ricardo São João</u>, membro do **CEAUL**, pretende-se demonstrar a utilização do IBM SPSS Statistics na análise de dados em Saúde e Ciências da Vida com recurso a vários exemplos permitindo uma ampla visão de diferentes abordagens metodológicas. O Seminário é dirigido a estudantes de todos os ciclos de estudo, em particular de Mestrado/Doutoramento e aos profissionais/investigadores que no seu quotidiano lidam com dados na área das ciências da vida e da saúde e que pretendam incorporar a análise de dados na tomada de decisão com recurso à utilização do *IBM SPSS Statistics*.

Seminário, resultante da parceria CEAUL e GADES Solutions, gratuito, mas com inscrição obrigatória.

Mais informação e inscrição aqui.

Curso

Estatística e Análise de Dados em Saúde com SPSS

3.ª e 4.ª feiras de 17 junho a 7 julho 2025 | 18:30 - 20:30 | Online

Curso online, de 8 sessões e com uma duração total de 16 horas.

O curso pretende fornecer as ferramentas necessárias para que o investigador na área da saúde consiga desenvolver, de forma autónoma, trabalhos de investigação científica utilizando a metodologia estatística apropriada. Pretende-se que no final do curso, o formando consiga aplicar técnicas de análise descritiva e inferencial, bem como identificar a metodologia estatística apropriada de acordo com diferentes desenhos experimentais e interpretar os resultados. O software a abordar é o SPSS. Curso destinado a estudantes de Mestrado e Doutoramento e aos profissionais que desenvolvem investigação científica na área da saúde.

O curso ministrado por Ricardo São João, membro do CEAUL, e resultante da parceria entre o CEAUL e a GADES Solutions.

Mais informação e inscrição <u>aqui</u>.

Mathematics Special Issue: Advances in Statistics, Biostatistics and Medical Statistics

Guest Editor - Tiago Dias Domingues, DEIO and CEAUL member

Deadline for manuscript submission: 20 June 2025

The fields of statistics, biostatistics, and medical statistics are experiencing rapid advancements driven by the increasing complexity of data and the critical need for rigorous analytical methods in health-related research. This Special Issue brings

together a collection of cutting-edge research articles that showcase the latest developments in these domains. The contributions highlight innovative statistical methodologies, novel applications in biostatistics, and transformative approaches in medical statistics. Topics covered include, but are not limited to, advanced modeling techniques, high-dimensional data analysis, machine learning integration, and the statistical challenges posed by personalized medicine. The Special Issue aims to serve as a valuable resource for statisticians, biostatistical challenges in the biomedical and public insights into emerging trends and offering practical solutions to current statistical challenges in the biomedical and public health sectors. By fostering interdisciplinary collaboration and knowledge exchange, this Special Issue contributes to the ongoing evolution of statistical science in the context of medical and health-related research.

More information <u>here</u>.

Stochastic Environmental Research and Risk Assessment (SERRA)

Statistical Analysis and Modeling of Characteristics and Impacts of Major Mechanisms of Atmospheric Moisture Transport

Guest Editors - Luis Gimeno, University of Vigo, <u>Patrícia de Zea Bermudez</u>, DEIO and **CEAUL** member, and <u>Luis Gimeno-</u> <u>Sotelo</u>, DEIO and **CEAUL** member

Submission deadline: 30 June 2025

This Collection is devoted to original and innovative applications of recent statistical methodologies to the study of the major mechanisms of atmospheric moisture transport of atmospheric rivers, low-level jets, tropical cyclones and monsoons. This includes both the study of the characteristics of these systems – structure, spatial distribution, trends in their occurrence, analysis of extremes – as well as the assessment of their impacts mainly extreme precipitation events, floods and droughts.

For this Collection we invite cutting-edge contributions related to methods and applications of spatio-temporal statistics, data mining, data visualization, automatic algorithms, clustering and classification analysis of temporal series, extreme value modelling and analysis of dependence structures on topics.

More information here.

Call for invited session proposals 2026 ISBA World Meeting

28 June - 3 July 2026 | Aichi Industry & Labor Center, Nagoya, Japan

Deadline for invited sessions proposal submission: 6 July 2025

The 18th World Meeting of the International Society for Bayesian Analysis - 2026 ISBA World Meeting, will take place at the Aichi Industry & Labor Center - <u>WINC AICHI</u> in <u>Nagoya, Japan</u>. The purpose of the meeting is to bring together the diverse international community of investigators in statistics who develop and use Bayesian methods to share recent findings and to present new and challenging problems.

The call for Contributed Talks and Posters will open in Fall 2025, after Invited Session decisions are announced. More information <u>here</u>.

Axioms – Special Issue **Probability Theory and Stochastic Processes: Theory and Applications**

Guest Editors - <u>João Paulo Martins, Rui Santos</u> e <u>Miguel Felgueiras</u>, membros integrados do CEAUL.

Submission deadline: 31 December 2025

Probability theory and stochastic processes are fundamental branches of mathematics with extensive applications in various scientific and engineering disciplines. Over the years, advancements in probability theory and stochastic processes have led to groundbreaking developments in areas such as machine learning, network analysis, and risk management,

highlighting their importance in both theoretical and applied contexts. This Special Issue seeks to showcase the latest developments in this vibrant field, emphasizing both innovative theoretical contributions and practical applications that address real-world challenges.

The aim of this Special Issue is to bring together high-quality research that advances our understanding of probability theory and stochastic processes. This includes theoretical breakthroughs, novel methodologies, and significant applications that demonstrate the versatility and impact of these mathematical tools. This Special Issue aligns with the journal's scope by fostering interdisciplinary connections and disseminating knowledge that bridges theoretical foundations and practical implementations.

In this Special Issue, original research articles and reviews are welcome.

More information <u>here</u>.

Newsletter "Ciências agora" <u>aqui</u>. Newsletter da FCT <u>aqui</u>. Arquivo da divulgação CEAUL <u>aqui</u>. Siga o CEAUL: <u>Facebook</u>, <u>Instagram</u>, <u>X, LinkedIN</u>