

# Nina DELIU

Researcher RTDA @ MEMOTEF, Sapienza Università di Roma  
Visiting Researcher @ MRC-BSU, University of Cambridge

## PART I – GENERAL INFORMATION

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Full Name Nina Deliu

Languages Italian (C2), English (C1), Romanian (C1), Russian (B2), French (B1)

## PART II – EDUCATION

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### UNIVERSITY DEGREES

- 2021 **PhD in Methodological Statistics** (33 cycle) - Sapienza Università di Roma  
*Reinforcement Learning in Modern Biostatistics: Benefits, Challenges and New Proposals*  
Internal Supervisor: PIERPAOLO BRUTTI  
External Supervisors: BIBHAS CHAKRABORTY, JOSEPH JAY WILLIAMS
- 2017 **MSc in Statistics and Decisions** - Sapienza Università di Roma  
*Deep Learning to the Test: an Application to Traffic Data Streams*  
Supervisor: PIERPAOLO BRUTTI. Grade: 110 *cum laude*
- 2016 **MSc in Mathématiques, Informatique, Décision, Organisation**  
*Double degree programme - Université Paris-Dauphine (France)*  
*Evidence Estimation of State Space Models: Sequential Monte Carlo<sup>2</sup> and Chib's Method*  
Supervisor: CHRISTIAN P. ROBERT
- 2014 **BSc in Statistics, Economics and Society** - Sapienza Università di Roma  
*Income distribution analysis in post-communist economies*  
Supervisor: ALESSANDRO RONCAGLIA. Grade: 110 *cum laude*

### SUMMER SCHOOLS (SS) AND POST-GRADUATE COURSES

- 2023 *Gentle Introduction to Bayesian Nonparametrics* (3days; B Liseo) - Università di Perugia (online)
- 2019 *Deep Learning and Reinforcement Learning SS* (2weeks) - University of Alberta (CA)  
(Selected in the 2019 year's cohort: 300 students out of 1256 applications)
- 2019 *Deep Learning con Python per l'analisi di Big Data* (1week) - DSS, Sapienza Università di Roma
- 2019 *Teoria dei valori estremi: aspetti di base* (1week; PL Conti) - DSS, Sapienza Università di Roma
- 2018 *Bayesian Model Selection* (3days; J Berger) - MEMOTEF, Sapienza Università di Roma
- 2018 *1st International SS on Bayesian Data Analysis with Stan* (1week) - Università di Pavia
- 2018 *Analisi Spaziale per dati longitudinali* (3days; TSTAT) - Roma  
(Prize for winning the SIS2018 best poster award)
- 2017 *Introduction to R-INLA for Bayesian Spatial Modelling* (3days) - DSS, Sapienza Università di Roma
- 2017 *Fall Lecture Series on Survival Analysis* (1month) - Northwestern University (online)
- 2017 *Machine Learning Crash Course* (3days; Google) - DIAG, Sapienza Università di Roma

## PART III – APPOINTMENTS

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### IIIA – ACADEMIC APPOINTMENTS

02/2022 – current	<b>University of Cambridge</b> – <i>Long-term Visiting Research Fellow</i>
12/2021 – current	<b>Sapienza Università di Roma</b> – <i>Researcher RTDA (PON-DM1062)</i>
05/2021 – 12/2021	<b>University of Cambridge</b> – <i>Postdoctoral Research Associate</i>
11/2020 – 04/2021	<b>University of Cambridge</b> – <i>Research Assistant</i>
01/2020 – 03/2020	<b>University of Toronto</b> – <i>Visiting Scholar</i>
03/2019 – 06/2019	<b>Duke - National University of Singapore (NUS)</b> – <i>Visiting Scholar</i>

### IIIB – OTHER APPOINTMENTS

08/2024 – 09/2024	<b>FAO (Statistics Division)</b> – <i>Statistical Consultant</i>
01/2022 – 06/2023	<b>Fondazione Giacomo Brodolini</b> – <i>Statistical Consultant</i>
06/2016 – 06/2018	<b>Fondazione GIMEMA, Franco Mandelli ONLUS</b> – <i>Biostatistician</i>

## PART IV – TEACHING AND SUPERVISION

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### LECTURING

AY 2023/2024	<i>Time Series and Financial Time Series</i> (MSc Course 72h; ENG) Master's Degree in <i>Finance and Insurance</i> , MEMOTEF, <b>Sapienza Università di Roma</b>
AY 2023/2024	<i>Multivariate Statistics with R</i> (PhD Course 12h; ENG) PhD in <i>Modelli per l'Economia e la Finanza</i> , MEMOTEF, <b>Sapienza Università di Roma</b>
AY 2022/2023	<i>Analisi delle Serie Storiche</i> (MSc Course 48h; IT) Master's Degree in <i>Finanza e Assicurazioni</i> , MEMOTEF, <b>Sapienza Università di Roma</b>
AY 2022/2023	<i>Multivariate Statistics with R</i> (PhD Course 16h; ENG) PhD in <i>Modelli per l'Economia e la Finanza</i> , MEMOTEF, <b>Sapienza Università di Roma</b>
AY 2022/2023	<i>Multivariate Statistics with R</i> (PhD Course 6h; ENG) PhD in <i>Management, Banking and Commodity Sciences</i> , Management, <b>Sapienza Uni</b>
AY 2021/2022	<i>Multivariate Statistics with R</i> (PhD Course 16h; ENG) PhD in <i>Modelli per l'Economia e la Finanza</i> , MEMOTEF, <b>Sapienza Università di Roma</b>
AY 2021/2022	<i>Multivariate Statistics with R</i> (PhD Course 12h; ENG) PhD in <i>Management, Banking and Commodity Sciences</i> , Management, <b>Sapienza Uni</b>
AY 2020/2021	<i>Laboratorio di Metodi per la Ricerca Sociale</i> (MSc Course 20h; IT) <b>Pontificia Facoltà di Scienze dell'Educazione Auxilium</b>
AY 2020/2021	<i>Coaching formativo per competenze all'uso di <math>\LaTeX</math> e Beamer</i> (BSc Course 10h; IT) Department of Statistical Sciences (DSS), <b>Sapienza Università di Roma</b>
AY 2019/2020	<i>Coaching formativo per competenze all'uso di <math>\LaTeX</math> e Beamer</i> (BSc Course 10h; IT) Department of Statistical Sciences (DSS), <b>Sapienza Università di Roma</b>

### EXAMINER

AY 2022/2023	<i>Time Series and Financial Time Series</i> (ENG) Master's Degree in <i>Finance and Insurance</i> , MEMOTEF, <b>Sapienza Università di Roma</b>
AY 2021/2022	<i>Time Series and Financial Time Series</i> (ENG) Master's Degree in <i>Finance and Insurance</i> , MEMOTEF, <b>Sapienza Università di Roma</b>
AY 2021/2022	<i>Analisi delle Serie Storiche</i> (IT) Master's Degree in <i>Finanza e Assicurazioni</i> , MEMOTEF, <b>Sapienza Università di Roma</b>

## TEACHING ASSISTANCE

- AY 2020/2021 *Statistics for Health Data Science* (MPhil Course ENG; Prof. S Seaman)  
MPhil course in *Population Health Sciences*, **University of Cambridge**
- AY 2019/2020 *Statistical Methods In Data Science And Laboratory* (MSc Course ENG; Prof. P Brutti)  
Master's Degree in Data Science, DIAG, **Sapienza Università di Roma**
- AY 2018/2019 *Statistical Methods In Data Science And Laboratory* (MSc Course ENG; Prof. P Brutti)  
Master's Degree in Data Science, DIAG, **Sapienza Università di Roma**
- AY 2017/2018 *Inferenza Statistica* (BSc Course IT; Prof. F De Santis)  
Bachelor's Degree in *Statistics, Economics, Finance and Insurance*, DSS, **Sapienza Uni**
- AY 2017/2018 *Statistica per l'Economia* (BSc Course IT; Prof. M Barbieri)  
Bachelor's Degree in *Economics*, Economics Dept, **Università Roma Tre**

## TRAINING AND TUTORING

- 2022 Training seminars for the Erasmus+ Programme *ResearchCult in Higher Education in Kosovo*, **University of Pristina**, Kosovo  
– *A review of the main models and techniques for data analysis* (ENG)  
– *Use of  $\LaTeX$  in research* (ENG)
- 2019 *Introduction to SAS* (Master II Course 4h; IT)  
Master II in *Big Data: Metodi statistici per la società della conoscenza*, DSS, **Sapienza Uni**
- 2019 *Introduction to  $\LaTeX$  and Beamer* (Master II Course 4h; IT)  
Master II in *Big Data: Metodi statistici per la società della conoscenza*, DSS, **Sapienza Uni**
- 2018 *Academic Tutor* (Master II 150h; IT)  
Master II in *Big Data: Metodi statistici per la società della conoscenza*, DSS, **Sapienza Uni**

## SUPERVISION

- 2024 – exp 2027 Amy Armento, PhD Student in Biostatistics  
Joint supervision with Sofia S Villar, **University of Cambridge**
- exp 2024 Anna Polyakova, MSc in FINASS, **Sapienza Università di Roma**  
Tentative project: *Adaptive conformal prediction for time series*
- exp 2024 Davide Di Leonforte, MSc in FINASS, **Sapienza Università di Roma**  
Tentative project: *Calibrating probabilistic predictions with e-values*
- exp 2024 Daniele Gidiucci, MSc in FINASS, **Sapienza Università di Roma**  
Tentative project: *Impatto delle guerre sui mercati finanziari e sul sentiment*
- exp 2024 Emanuele Masillo, MSc in FINASS, **Sapienza Università di Roma**  
Tentative project: *Highest-density regions in 3+ dimensions*
- exp 2024 Emanuele Santaera, MSc in FINASS, **Sapienza Università di Roma**  
Tentative project: *Conformal inference for classification problems*
- exp 2024 Filippo M Novellino, MSc in FINASS, **Sapienza Università di Roma**  
Project: *Algoritmi multi-armed bandits per la selezione dinamica del modello*
- 2024 Cristofaro Indorato, MSc in FINASS, **Sapienza Università di Roma**  
Project: *Scenari Futuri nel Metaverso: Predizione e sentiment analysis tramite reti neurali ricorrenti* (graduated with 110 cum laude)
- 2024 Co-supervisor of Edoardo Pandolfo, MSc in FINASS, **Sapienza Università di Roma**  
Project: *Extreme Value Theory applied to Finance – VaR Evaluation using High Frequency Data* (Main supervisor: A Tancredi; graduated with 110 cum laude)
- 2023 Emilio Tarducci, MSc in FINASS, **Sapienza Università di Roma**  
Project: *Thompson Sampling per decisioni ottime in finanza: scelta del modello e di portafogli* (graduated with 110 cum laude)
- 2023 Co-supervisor of Lorenzo Lombardi, MSc in FINASS, **Sapienza Università di Roma**  
Project: *Dynamic Conditional Beta: Proprietà e applicazioni empiriche su portafogli industriali* (Main supervisor: B Liseo; graduated with 110 cum laude)

- 2023 Sagnik Biswas (joint supervisor with B Chakraborty), Intern, **Duke-NUS**  
Project: *Modeling non-stationarities in multi-armed bandit problems*
- 2022 Thomas Slater, Summer Intern, **University of Cambridge**  
Project: *Adaptive allocation under high dimensional contexts*

## MENTORING

- 2022 – current Mentor to Rajenki Das, Research Associate in the *Efficient Study Design* group  
Manager: Sofia S Villar, **University of Cambridge**
- 2021 – exp 2025 Mentor to Xinru Wang, PhD Candidate in Biostatistics & Health Data Science  
Main supervisor: Bibhas Chakraborty, **Duke-NUS**
- 2021 – exp 2025 Mentor to Xueqing Liu, PhD Candidate in Biostatistics & Health Data Science  
Main supervisor: Bibhas Chakraborty, **Duke-NUS**

## PART V – AWARDS AND HONORS

- 12/2023 ICSDS2023 Conference – *IMS Travel Award*  
Invited talk: *Modeling considerations when optimizing adaptive experiments under the reinforcement learning framework*
- 05/2023 The Institute of Education Sciences (IES) – *XPRIZE Digital Learning Challenge* (  
Project: *Adaptive Experimentation Accelerator: The MOOClet Framework*  
(Partnership with Toronto Uni, Carnegie Mellon Uni & North Carolina State Uni)
- 06/2018 SIS Annual Meeting – *Best Poster Prize 2018* ( + Tstat Course)  
Poster: *Deep Learning to the Test: an Application to Traffic Data Streams*
- 10/2017 International Society for Quality of Life (ISOQOL) – *New Investigator Award*  
Talk: *Modelling Strategies to Improve Estimates of Prognostic Factors Analyses with PROs*
- 07/2014 DiSCo Lazio – *Graduation Prize* ( )

## PART VI – FUNDING: SCHOLARSHIPS, GRANTS (PI / CO-PI)

- Re-submission* **EU Commission – HORIZON MSCA Doctoral Networks 2024** (24 Partners;  
Title: *Statistical Methodologies for Personalised Approaches to Healthcare Delivery*
- Submitted* **Sapienza Università di Roma – Academic Research Grant (PI)**;  
Title: *Methods for Designing Adaptive Experiments to Enhance Digital Education in Statistical Courses*
- 2024 (\$50K) **World Anti-Doping Agency – WADA Research Grant (Co-PI; PI: B Liseo)**  
Title: *Enhancing the methodological framework for doping detection: from univariate to multivariate testing analysis on Athlete Biological Passport profiles*
- Rejected* **EU Commission – HORIZON MSCA Doctoral Networks 2023** (24 Partners;  
Title: *Statistical Methodologies for Personalised Approaches to Healthcare Delivery – Proposal rejected with a score of 88% (threshold: 70/100); to be resubmitted in 2024*
- 2022 (€3K) **Sapienza Università di Roma – Academic Research Grant (PI)**  
Title: *Development of a Methodological Framework for Enhancing the Fight Against Doping. Using Copulae for Multivariate Testing Analysis on ABP Profiles*
- Rejected* **Turing Institute and Roche Partnership – Structured Missingness (Co-I)**  
Title: *Personalized Cancer Treatment with Missing Data: An Optimization Approach*
- 2019 (€1K) **Sapienza Università di Roma – Academic Starting Research Grant (PI)**  
Title: *Contextual Bandits for Developing Personalized Mobile Health Interventions*
- 2019 (\$1750) **CIFAR & AMII – Travel Scholarship** for attending the *Deep Learning and Reinforcement Learning Summer School*, University of Alberta, Canada
- 2018 (€1K) **Sapienza Università di Roma – Academic Starting Research Grant (PI)**  
Title: *Self-reported health outcomes in cancer risk prediction using the UK Biobank*

## PART VII – CURRENT RESEARCH ACTIVITIES

Keywords	Short description
<ul style="list-style-type: none"> <li>Reinforcement learning (RL)</li> <li>Multi-armed bandits (MAB)</li> </ul>	Study and development of statistically-considerate RL and MAB algorithms for sequential decision-making problems <i>Motivating applications:</i> Adaptive interventions, Dynamic treatment regimes, JITAs in mobile health, Adaptive experiments <i>Collab:</i> <a href="#">National University of Singapore</a> , <a href="#">Cambridge University</a>
<ul style="list-style-type: none"> <li>Design of experiments</li> <li>Inference in adaptive designs</li> </ul>	Developing Bayesian experimental designs with improved participant and statistical outcomes Developing valid inference methods for adaptively-collected data <i>Motivating applications:</i> Adaptive and personalised designs for clinical trials, Adaptive experiments in higher education <i>Collab:</i> <a href="#">Cambridge University (MRC-Biostats Unit, Department of Medicine)</a> , <a href="#">University of Toronto</a> , <a href="#">Royal Papworth Hospital</a>
<ul style="list-style-type: none"> <li>Uncertainty quantification</li> <li>Statistical intervals</li> <li>Conformal inference</li> </ul>	Parametric and non-parametric (conformal inference, bootstrap, etc) statistical methods for uncertainty/accuracy quantification Estimation of highest-density and conformal statistical regions <i>Motivating applications:</i> Accuracy of registers in official statistics, Inference in sample survey designs, Doping detection, Estimation of disaster-induced production loss in agriculture <i>Collab:</i> <a href="#">ISTAT</a> , <a href="#">NADO Italia</a> , <a href="#">FAO</a>
<ul style="list-style-type: none"> <li>Bayesian copula modeling</li> </ul>	Development of a multivariate copula-based Bayesian framework for enhanced testing analysis <i>Motivating application:</i> Doping detection in longitudinal athlete biological passport profile data <i>Collab:</i> <a href="#">NADO Italia</a> , <a href="#">World Anti-Doping Agency</a>

## PART VIII: SELECTED RESEARCH ARTICLES

(Total Citations: 271; Hirsch (h) index: 7; i10-index: 6 – Source: Google Scholar)

### PEER-REVIEWED JOURNAL ARTICLES

- [1] N. Deliu and B. Liseo. “Alternative Approaches for Estimating Highest-Density Regions”. In: *International Statistical Review* (2024). DOI: [10.1111/insr.12592](#).
- [2] X. Wang, N. Deliu, Y. Narita, and B. Chakraborty. “Incorporating participants’ welfare into sequential multiple assignment randomized trials”. In: *Biometrics* 80.1 (2024). DOI: [10.1093/biomtc/ujad004](#).
- [3] N. Deliu, J. J. Williams, and B. Chakraborty. “Reinforcement Learning in Modern Biostatistics: Constructing Optimal Adaptive Interventions”. In: *International Statistical Review* (2024). DOI: [10.1111/insr.12583](#).
- [4] N. Deliu. “Multinomial Thompson sampling for rating scales and prior considerations for calibrating uncertainty”. In: *Statistical Methods & Applications* 33.2 (2024), pp. 439–469. DOI: [10.1007/s10260-023-00732-y](#).
- [5] N. Deliu. “Reinforcement learning for sequential decision making in population research”. In: *Quality & Quantity* (2023). DOI: [10.1007/s11135-023-01755-z](#).
- [6] X. Liu, N. Deliu, and B. Chakraborty. “Microrandomized Trials: Developing Just-in-Time Adaptive Interventions for Better Public Health”. In: *American Journal of Public Health* 113.1 (2023), pp. 60–69. DOI: [10.2105/AJPH.2022.307150](#). (Paper with discussion, paper featured on the Jan 2023 issue cover. Outreach activity: [AJPH Podcast – SMART and MRT, emerging methods in public health](#)).

- [7] C. A. Figueroa, N. Deliu, B. Chakraborty, A. Modiri, J. Xu, J. Aggarwal, J. Jay Williams, C. Lyles, and A. Aguilera. “Daily Motivational Text Messages to Promote Physical Activity in University Students: Results From a Microrandomized Trial”. In: *Annals of Behavioral Medicine* 56.2 (2022), pp. 212–218. DOI: [10.1093/abm/kaab028](https://doi.org/10.1093/abm/kaab028).
- [8] C. A. Figueroa, A. Aguilera, B. Chakraborty, A. Modiri, J. Aggarwal, N. Deliu, U. Sarkar, J. Jay Williams, and C. R. Lyles. “Adaptive learning algorithms to optimize mobile applications for behavioral health: guidelines for design decisions”. In: *Journal of the American Medical Informatics Association* 28.6 (2021), pp. 1225–1234. DOI: [10.1093/jamia/ocab001](https://doi.org/10.1093/jamia/ocab001).
- [9] F. Cottone, N. Deliu, G. S. Collins, A. Anota, F. Bonnetain, K. Van Steen, D. Cella, and F. Efficace. “Modeling strategies to improve parameter estimates in prognostic factors analyses with patient-reported outcomes in oncology”. In: *Quality of Life Research* 28.5 (2019), pp. 1315–1325. DOI: [10.1007/s11136-018-02097-2](https://doi.org/10.1007/s11136-018-02097-2).
- [10] F. Sparano, N. K. Aaronson, F. Cottone, A. Piciocchi, E. La Sala, A. Anota, N. Deliu, J. M. Kieffer, and F. Efficace. “Clinician-reported symptomatic adverse events in cancer trials: are they concordant with patient-reported outcomes?” In: *Journal of Comparative Effectiveness Research* 8.5 (2019), pp. 279–288. DOI: [10.2217/cer-2018-0092](https://doi.org/10.2217/cer-2018-0092).
- [11] N. Deliu, F. Cottone, G. S. Collins, A. Anota, and F. Efficace. “Evaluating methodological quality of Prognostic models Including Patient-reported Health outcomes iN oncology (EPIPHANY): a systematic review protocol”. In: *BMJ Open* 8.10 (2018), e025054. DOI: [10.1136/bmjopen-2018-025054](https://doi.org/10.1136/bmjopen-2018-025054).
- [12] A. Ousmen, C. Touraine, N. Deliu, F. Cottone, F. Bonnetain, F. Efficace, A. Brédart, C. Mollevi, and A. Anota. “Distribution- and anchor-based methods to determine the minimally important difference on patient-reported outcome questionnaires in oncology: a structured review”. In: *Health and Quality of Life Outcomes* 16.1. Article number: 228 (2018). DOI: [10.1186/s12955-018-1055-z](https://doi.org/10.1186/s12955-018-1055-z).

#### PEER-REVIEWED CONFERENCE PROCEEDINGS

- [13] N. Deliu, J. J. Williams, and S. S. Villar. “Finite-sample inference in response-adaptive designs: an application to Thompson sampling”. In: *Methodological and Applied Statistics and Demography II SIS 2024, Short Papers, Solicited Sessions*. Ed. by A. Pollice and P. Mariani. Italian Statistical Society Series on Advances in Statistics. Bari, Italy: Springer Cham, 2024. ISBN: 978-3-031-64349-1.
- [14] H. Kumar, T. Li, J. Shi, I. Musabirov, R. Kornfield, J. Meyerhoff, A. Bhattacharjee, C. Karr, T. Nguyen, D. Mohr, A. Rafferty, S. Villar, N. Deliu, and J. J. Williams. “Using Adaptive Bandit Experiments to Increase and Investigate Engagement in Mental Health”. In: *Proceedings of The AAAI Conference on Artificial Intelligence*. Vol. 38. 2024, pp. 22906–22912. DOI: [10.1609/aaai.v38i21.30328](https://doi.org/10.1609/aaai.v38i21.30328). (Full-length paper in Top-tier AI-ML conference; 2024 acceptance rate = 23.7%).
- [15] I. Musabirov, M. Reza, S. Moore, P. Chen, H. Kumar, T. Li, H. Song, J. Shi, K. Choy, T. Price, J. Stamper, N. Bier, N. Deliu, S. S. Villar, A. Rafferty, A. Durand, and J. J. Williams. “Platform-based Adaptive Experimental Research in Education: Lessons Learned from Digital Learning Challenge”. In: *The Fourteenth International Conference on Learning Analytics & Knowledge (LAK24): Learning Analytics in the Age of Artificial Intelligence*. Kyoto, Japan: ACM, 2024. ISBN: 9798400716188. (Full-length paper in AI-ML Conference; 2024 acceptance rate = 26.1%).
- [16] A. Bhattacharjee, H. Song, X. Wu, J. Tomlinson, M. Reza, A. E. Chowdhury, N. Deliu, T. W. Price, and J. J. Williams. “Informing Users about Data Imputation: Exploring the Design Space for Dealing With Non-Responses”. In: *The eleventh AAAI Conference on Human Computation and Crowdsourcing (HCOMP2023)*. Vol. 11. Delft, The Netherlands, 2023, pp. 14–26. DOI: [10.1609/hcomp.v11i1.27544](https://doi.org/10.1609/hcomp.v11i1.27544). (Full-length paper in Top-tier AI-ML conference; 2023 acceptance rate ≈ 25%).
- [17] N. Deliu and B. Liseo. “Computing Highest Density Regions with Copulae”. In: *SEAS IN. Statistical Learning, Sustainability and Impact Evaluation, Book of Short Papers SIS 2023*. Ed. by F. M. Chelli, M. Ciommi, S. Ingrassia, F. Mariani, and M. C. Recchioni. Ancona, Italy: Pearson, 2023, pp. 1235–1240. ISBN: 9788891935618. (Short paper extended to journal article [1]).
- [18] I. Chien, N. Deliu, R. Turner, A. Weller, S. Villar, and N. Kilbertus. “Multi-disciplinary fairness considerations in machine learning for clinical trials”. In: *ACM FAccT ’22: Proceedings of the 2022 ACM Conference on Fairness, Accountability, and Transparency*. Seoul, Republic of Korea: ACM, 2022, pp. 906–924. ISBN: 9781450393522. DOI: [10.1145/3531146.3533154](https://doi.org/10.1145/3531146.3533154). (Full-length paper in Top-tier AI-ML conference; 2022 acceptance rate ≈ 24%).



- [19] N. Deliu. “Multinomial Thompson Sampling for adaptive experiments with rating scales”. In: *Book of Short Papers SIS 2022*. Ed. by A. Balzanella, M. Bini, C. Cavicchia, and R. Verde. Caserta, Italy: Pearson, 2022, pp. 1065–1070. ISBN: 9788891932310. (*Short paper extended to journal article [4]*).
- [20] N. Deliu and P. Brutti. “Deep Learning to the Test: an Application to Traffic Data Streams”. In: *Book of Short Papers SIS 2018*. Ed. by A. Abbruzzo, E. Brentari, M. Chiodi, and D. Piacentino. Palermo, Italy: Pearson, 2018, pp. 1597–1602. ISBN: 9788891910233. (*Best poster award*).

#### BOOK CHAPTERS

- [21] N. Deliu and B. Chakraborty. “Artificial Intelligence-based Decision Support Systems for Precision and Digital Health”. In: *Frontiers of Statistics and Data Science*. Ed. by S. Ghoshal and A. Roy. International Indian Statistical Association Series on Statistics and Data Science. Springer, 2024 (*In Press*). (*With anonymous peer review*).
- [22] N. Deliu. “Multiculturalism and Interculturalism: A Qualitative Analysis of the Perspective of Focus Group Participants”. In: *Education in Multiculturalism, Education to Interculturalism. In Ecclesiastical Institutions of Higher Education and in Formation Communities for Catholic Consecrated Life in Italy*. Ed. by E. Ottone and L. Pandolfi. Urbaniana University Press, Città del Vaticano, 2023, pp. 113–158. ISBN: 978-88-401-9061-7.
- [23] N. Deliu and B. Chakraborty. “Dynamic Treatment Regimes for Optimizing Healthcare”. In: *The Elements of Joint Learning and Optimization in Operations Management*. Ed. by X. Chen, S. Jasin, and C. Shi. Springer Series in Supply Chain Management. Cham: Springer International Publishing, 2022, pp. 391–444. ISBN: 9783031019265. DOI: [10.1007/978-3-031-01926-5\\_15](https://doi.org/10.1007/978-3-031-01926-5_15).

#### PHD THESIS

- [24] N. Deliu. “Reinforcement Learning in Modern Biostatistics: Benefits, Challenges and New Proposals”. PhD Thesis. Rome: University of Rome La Sapienza, 2021.

#### UNDER REVIEW AND WORKING PAPERS

- Revised (2nd review round)** Liu, X., Deliu, N., Chakraborty, T., Bell, L., and Chakraborty, B., *Thompson sampling for zero-inflated count outcomes with an application to the Drink Less mobile health study*. Arxiv Preprint: <https://arxiv.org/abs/2311.14359>
- Revised (2nd review round)** Deliu, N., Das, R., May, A., Steele, J., Duckworth, M., Jones, R.J., Wilkins, M.R., Toshner, M., and Villar, S.S. *StratosPHere 2: A response-adaptive randomised placebo-controlled Phase II trial to evaluate hydroxychloroquine and phenylbutyrate in pulmonary arterial hypertension caused by mutations in BMPR2*. Preprint: <https://doi.org/10.21203/rs.3.rs-3392621/v1>
- Revision** Deliu, N. and Villar, S.S., *Finite-sample and asymptotic validity of a novel design-based test statistic for response-adaptive randomisation*.
- Under Review** Deliu, N. and Liseo, B. *A Multivariate Copula-based Hierarchical Framework for Doping Detection*. Arxiv Preprint: <https://arxiv.org/abs/2404.12499>
- Submitted** Deliu, N., Das, R., and Villar S.S. *From theory to practice: safe implementation of response-adaptive randomization designs in stratified clinical trials*.
- Submitted** Jones, R.J., De Bie, E.M.D.D., Ng, A.Y.K., Dunmore, B.J., Deliu, N., Graf, S., Lawrie, A., Newman, J., Polwarth, G., Rhodes, C., Hemnes, A., West, J., Villar, S., Upton, P.D., UK National Cohort Study of Idiopathic and Heritable PAH Consortium, the Uniphy Clinical Trials Network, and Toshner, M.R. *BMPR-II Biomarkers for testing therapeutic efficacy in pulmonary arterial hypertension – novel findings from the StratosPHere 1 study*.
- In Submission** Liu, X., Deliu, N., Bell, L., and Chakraborty, B., *A comparison of longitudinal models for analyzing contextual bandit collected count data in mobile health*.
- In Submission** Deliu, N., Falorsi, P.D., Falorsi, S., Chianella, D., Alleva, G. *Evaluating the Accuracy of Official-Statistics Registers: the Generalized Mean Squared Error for Multinomial Outcomes*.

**arXiv** Li, T., Nogas, J., Song, H., Kumar, H., Durand, A., Rafferty, A., Deliu, N., Villar, S.S., Williams, J.J. *Algorithms for Adaptive Experiments that Trade-off Statistical Analysis with Reward: Adaptively Combining Uniform Random Assignment and Thompson Sampling*. Accepted at the Workshop on Causal Inference Challenges in Sequential Decision Making: Bridging Theory and Practice, NeurIPS 2021. Arxiv Preprint: <https://arxiv.org/abs/2112.08507>

**arXiv** Williams, J. J., Nogas, J., Deliu, N. et al., *Challenges in Statistical Analysis of Data Collected by a Bandit Algorithm: An Empirical Exploration in Applications to Adaptively Randomized Experiments*. Arxiv Preprint: <https://arxiv.org/abs/2103.12198>

## PRESENTATIONS

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### Upcoming

- 12/2024 **Invited Talk @ ICSDS2024**, Nice (FR)  
*Finite-sample and Asymptotic Error Control of a Novel Test for Response-adaptive Designs*
- 10/2024 **Invited Talk @ International Day of Women in Statistics and Data Science**, online  
*Finite-sample and Asymptotic Error Control of a Novel Test for Response-adaptive Designs*
- 09/2024 **Contributed Poster @ COPA2024**, Politecnico di Milano (IT)  
*Anomaly Detection in Multivariate Profiles with Conformal Bayesian Inference*
- 2024
- 06/2024 **Invited Talk @ SIS2024**, Università degli Studi di Bari (IT)  
*Finite-sample inference in response-adaptive designs: an application to Thompson sampling*
- 03/2024 **Chair & Discussant @ SIS2024**, Università degli Studi di Bari (IT)  
*Session: Health Statistics & Bayesian methods*
- 06/2024 **Invited Talk @ BMS-ANed Meeting (Dutch Section of IBS)**, Erasmus University MC (NH)  
*Online sequential-decision making via bandits: modeling considerations for better decisions*
- 05/2024 **Contributed Talk @ AUEB Sports Analytics Workshop 2024**, AUEB Athens (GR)  
*A Multivariate Copula-based Conformal Bayesian Framework for Doping Detection*
- 05/2024 **Invited Seminar @ Department of Statistical Sciences, Università di Padova** (IT)  
*Designing experiments via bandit algorithms: modeling considerations for better outcomes*
- 04/2024 **Keynote Talk @ ALBECS2024: Algorithmic Behavior Change Support** (19th International Conference on Persuasive Technology 2024), University of Wollongong (AU; online)  
*Designing adaptive experiments via bandits: modeling considerations for better outcomes*
- 05/2024 **Invited Seminar @ Department of Statistical Sciences, University College of London** (UK)  
*A Multivariate Copula-based Conformal Bayesian Framework for Doping Detection*
- 03/2024 **Contributed Talk @ MEMOTEF Research Days 2024**, Sapienza Università di Roma (IT)  
*Reinforcement learning for sequential decision-making: from healthcare to finance*
- 03/2024 **Chair & Discussant @ MEMOTEF Research Days 2024**, Sapienza Università di Roma (IT)  
*Discussion Session: Food for Thought. Insights on the Research Carried out by the Department.*
- 02/2024 **Invited Talk @ Response-Adaptive Randomisation Workshop**, Cambridge University (UK)  
*Thompson sampling for zero-inflated count data in mobile health trials*
- 2023
- 12/2023 **Invited Talk @ ICSDS2023**, Lisbon (PR)  
*Modeling considerations when optimizing adaptive experiments with reinforcement learning*
- 09/2023 **Invited Talk @ StaTalk 2023**, DSS, Sapienza Università di Roma (IT)  
*On the finite-sample and asymptotic validity of an allocation-probability test for adaptively-collected data*
- 09/2023 **Invited Talk @ Bayesian Day 2023**, DSS, Sapienza Università di Roma (IT)  
*Enhancing Patient Outcomes and Statistical Efficiency in Rare Disease Phase-II Trials*
- 08/2023 **Invited Talk @ JSM2023**, Toronto (online)  
*An Allocation Probability Test for Adaptive Experiments: Application to Thompson Sampling*
- 08/2023 **Contributed Poster @ ISCB2023**, Università degli Studi di Milano Bicocca (IT)  
*Enhancing Patient Outcomes and Statistical Efficiency in Rare Disease Phase-II Trials*
- 08/2023 **Contributed Talk @ EcoSta2023**, Waseda University, Tokyo (JP)  
*Probabilistic and Distance-based Approaches for Computing Highest-Density Regions*



- 06/2023 Contributed Talk @ **SIS2023**, Università Politecnica delle Marche (IT)  
*Computing Highest Density Regions with Copulae*
- 06/2023 Contributed Poster @ **MEMOTEF Research Days 2023**, Sapienza Università di Roma (IT)  
*Computing Highest Density Regions with Copulae*
- 06/2023 **Invited Talk** @ **ITACOSM2023**, Università della Calabria, Arcavacata di Rende (IT)  
*Assessing the predictive accuracy of official-statistics registries: the Global MSE*
- 05/2023 **Invited Seminar** @ **DISP, Università degli Studi di Napoli Federico II** (IT)  
*Multinomial Thompson Sampling for Online Sequential Decision Making with Rating Scales*
- 04/2023 Contributed Talk @ **ICNA-STA 2023**, University of Prishtina (Kosovo)  
*Adaptive Experiments for Digital Education: Benefits and Statistical Challenges*
- 02/2023 **Invited Seminar** @ **BSU Together, MRC-BSU, University of Cambridge** (online)  
*Enhancing the fight against doping: using copulae for multivariate testing analysis*
- 2022
- 06/2022 **Invited Talk** @ **IMS2022 Annual Meeting**, London School of Economics, London (UK)  
*Multinomial Thompson Sampling for adaptive experiments with rating scales data*
- 06/2022 Contributed Talk @ **SIS2022 Annual Meeting**, Università Luigi Vanvitelli, Caserta (IT)  
*Multinomial Thompson Sampling for adaptive experiments with rating scales data*
- 06/2022 **Invited Talk** @ **7th ICSPM 2022**, Academy of Economic Studies of Moldova (online)  
*Just-in-Time Adaptive Interventions to Guide Healthy Behavioral Changes*
- 06/2022 Contributed Talk @ **MEMOTEF Research Days 2022**, Sapienza Università di Roma (IT)  
*Enhancing the fight against doping: using copulas for multivariate testing analysis*
- 05/2022 Contributed Talk @ **AUEB Sports Analytics Workshop 2024**, AUEB Athens (GR)  
*Enhancing the fight against doping: using copulas for multivariate testing analysis*
- 05/2022 **Invited Seminar** @ **Inserm-Singapore COLLAB: Next Generation Trials**, INSERM (online)  
*Design-based Inference in Response-Adaptive Randomization*
- 02/2022 **Invited Seminar** @ **Università degli Studi della Tuscia** (IT)  
*Infortuni e morti sul lavoro pre e post-pandemia: alcuni dati statistici*
- 2021
- 11/2021 **Invited Talk** @ **18th Armitage Workshop and Lecture**, University of Cambridge (UK)  
*Design-based Inference in Response-Adaptive Randomization*
- 11/2021 **Invited Talk** @ **Inter. Congress on Multiculturality**, Pontificia Università Urbaniana (IT)  
*Multiculturality and Interculturality: a qualitative analysis on focus group interviews*
- 07/2021 **Invited Talk** @ **Bernoulli-IMS 10th World Congress in Probability and Statistics – Young Research Meeting**, Seoul National University (online)  
*Using Reinforcement Learning to Design Just-in-Time Adaptive Interventions*
- 03/2021 Contributed Talk @ **Stat.Edu21: New perspectives in Statistics Education** (online)  
*Adaptive Experiments for Digital Education: Benefits and Statistical Challenges*
- 2017-20
- 12/2020 **Invited Seminar** @ **Camplus College**, Rome (IT)  
*Reading the Numbers in Medicine: the Role of Statistics in Biomedical Studies*
- 07/2019 Contributed Poster @ **DLRLSS2019**, University of Alberta, Edmonton (CA)  
*Deep Learning to the Test: an Application to Traffic Data Streams*
- 06/2018 Contributed Poster @ **SIS2018 Annual Meeting**, Università degli Studi di Palermo (IT)  
*Deep Learning to the Test: an Application to Traffic Data Streams*
- 06/2018 Contributed Poster @ **V PhD Day of the School of Statistical Sciences**, DSS, Sapienza Università di Roma (IT)  
*Deep Learning to the Test: an Application to Traffic Data Streams*
- 10/2017 Contributed Talk @ **ISOQOL2018**, Philadelphia (USA)  
*Modelling Strategies to Improve Estimates of Prognostic Factors Analyses with PROs*
- '16-'18 **Invited Talk** @ **EORTC Annual Meetings**, Paris 2016, Manchester 2017, Bruxelles 2018 (EU)  
*An international field study for the reliability and validity of the EORTC-CML24*

## SERVICE TO PROFESSION

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### INSTITUTIONAL SERVICE (SAPIENZA UNIVERSITÀ DI ROMA)

- 2023–current Scientific and Organizing *Coordinator* of the XIV MEMOTEF Research Days 2024  
26-27 March 2024, National Institute of Roman Studies, Rome
- 2023–current *Committee Member* of TLC-S: Centro Interdipartimentale di Ricerca e Servizi Teaching  
and Learning Center Sapienza
- 2023 Scientific and Organizing *Committee Member* of the XIII MEMOTEF Research Days 2023  
27-28 June 2023, Italian Geographic Society, Rome

### INSTITUTIONAL SERVICE (UNIVERSITY OF CAMBRIDGE)

- 2023 *Search Committee Member* for a Postdoctoral Researcher (Research Associate @ MRC-  
BSU, University of Cambridge)
- 2022 *Selection Panel Member* for ten summer interns (Paid Summer Research Internships @  
MRC-BSU, University of Cambridge)

### EXTRA-INSTITUTIONAL SERVICE

- Editorial Board Member of [YoungStats](#) – The blog of Young Statisticians Europe (since 2021)
- Scientific coordinator of the Cultural and Scientific Collaboration Agreement between the International Business College Mitrovica (IBC-M) & MEMOTEF, Sapienza Università di Roma
- Scientific Committee Member of ICNA-STA International Scientific Conference 2023 (4-5 May 2023, University of Prishtina, Kosova)
- Member of the following societies: *IMS, ACM, SIS, YoungSIS, ISCB, IBS Italy, SIMEF*
- Member of the following international research groups: *Intelligent Adaptive Interventions Lab* (University of Toronto), *Adaptive Design Working Group* (MRC-NIHR Trials Methodology Research Partnership), *Efficient Study design* (MRC-BSU University of Cambridge)
- Journal Reviewer: *Biometrics, Biometrical Journal, Journal of the American Statistical Association, Neural Computation, Statistical Methods in Medical Research, Statistical Methods and Applications, Statistical Papers*
- Conference Reviewer: *International Conference on Artificial Intelligence and Statistics (AISTATS), American Medical Informatics Association (AMIA) Annual Symposium, Italian Statistical Society (SIS) Meeting, International Conference on New Achievements in Science, Technology and Arts (ICNA-STA)*
- Associate editor assistant of *Health and Quality of Life Outcomes* (2017–2018)
- Organizer & Chair in the following scientific sessions:
  - *Innovative design and analysis methods for optimizing healthcare* – **EcoSta 2023**
  - *Statistical methods for innovative experimental designs* – **IMS Annual Meeting 2022**
  - *Theory and Methods for Inference in MAB Problems* – **OneWorld YoungStatS 2022**
- Chair in the following scientific events:
  - *Session 2 – X PhD Day of the School of Statistical Sciences 2023, DSS, Sapienza*
  - *Networks and Graphs* – **MEMOTEF Research Days 2023**
  - *Education Sciences* – **ICNA-STA 2023**
  - *Social and Humanity Sciences* – **ICNA-STA 2022**

## OUTREACH ACTIVITIES

- Interview to Susan Athey, Professor @ Stanford University, published in [IMS Bulletin](#), 53(1), 2024
- Contribution to *Sapienza Open Days* – Economics Faculty, Sapienza Università di Roma (2022-2024)
- *Welcome Day Finass 2022*: Orientation day for new students (19 October 2022)
- Contributed blogpost *A day in the life of a statistician*, MRC–Biostatistics, University of Cambridge
- Curator of X (Twitter) page @WomenInStat
- Contribution to *Sapienza Open Days* – DSS, Sapienza Università di Roma (2018-2019)
- Tutoring and teaching support for the programme *Piano Lauree Scientifiche (PLS)*, DSS, Sapienza Università di Roma. Activities: tutoring for undergrad and grad students at DSS, tutoring during *Italian Statistics Olympics* organised by SIS, dissemination in high schools on the topics: *Designing a Survey*, *Laboratory of Probability*

## COMPUTER SKILLS

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Operating Systems: MacOS, Windows  
Software: R, R Studio, Python,  $\text{\LaTeX}$ , Microsoft Office, SAS, WinBUGS, JAGS, Stan

## DEVELOPMENT OF R PACKAGES

countts <https://cran.r-project.org/web/packages/countts/>  
(Supporting R package to revised journal article in AoAS: Liu, Deliu et al. 2024+)

HDR2D <https://github.com/nina-DL/HDR2D>  
(Supporting R package to journal article in ISR [1]: Deliu and Liseo, 2024)

*Tutto quanto dichiarato nel presente CV corrisponde a verità, ai sensi degli articoli 46 e 47 del D.P.R. 445 del 2000. Il documento è redatto modo da garantire la conformità del medesimo a quanto prescritto dall'art. 4 del Codice in materia di protezione dei dati personali e dall'art. 26 del D. Lgs. 14 marzo 2013, n. 33, al fine della pubblicazione.*

August 21, 2024