https://www.cima.uevora.pt/

CIMA's Scientific Report

2024

Contents

I. Overview of research activities in 2024

In 2024, (last official actualization up to 31st December 2024) the team of the Centro de Investigação em Matemática e Aplicações (CIMA), https://www.cima.uevora.pt/, was composed of 94 members: 68 Ph.D researchers and 26 non Ph.D integrated researchers, distributed over three poles: University of Évora, University of Madeira, Higher Institute of Engineering of Lisbon (ISEL).

The scientific research developed in CIMA was addressed on several topics according to the different four research groups (DEO, LAG, DS, SSPA) and two research lines: Mathematical Modelling in Life Sciences and Applications (MMLSA) and Mathematics and Applications to Technology and Industry (MATI).

Some highlights of CIMA's 2024 activity are:

- **Organization of the following meetings** :

  - **2nd International Workshop on Mathematics and Physical Sciences,** July, 11-12, University of Évora. Évora https://www.2iwmps24.uevora.pt/ (Satellite of 9th European Congress of Mathematics 2024, https://www.ecm2024sevilla.com/index.php/satellite-conferences/satellite-conferences-c).;
  - **CIMA's Annual Meeting 2024**, February 2-3, University of Madeira, Funchal, http://ccm.uma.pt/cima2024/

- **Sponsorship of international and national meetings :**

  - **Workshop on Operator Theory, Complex Analysis, and Applications 2024 - WOTCA 2024** will be held at University of Madeira, Portugal, on July 22-26, 2024, https://sites.google.com/view/wotca24/

♦ **24th European Conference on Iteration Theory (ECIT 2024)**, Vimeiro, Portugal, 27th to 31st May 2024, https://ecit2024.isel.pt/

https://monoidsproject.uca.es/evento/international-meeting-on-commutative-monoids-2023/?lang=en

♦ **IX Workshop on Computational Data Analysis and Numerical Methods (WCDANM)**, University of Évora (Portugal), September 05th to 07th, 2024, https://www.wcdanm2024.uevora.pt/

♦ **AESIM 2023 school Mathematics for Health Sciences**, BITS-Pilani, December 28, 2023—January 6, 2024, Pilani, India

- **Publications by CIMA's members (see Section A): 115**
- **Communications of CIMA's members in events (see Section B): 97**
- **Advanced Training (see Section E): 85 students**
- **Seminars (see Sections F and G): 53**
- **Participation in projects of CIMA's members(see Section H): 18**
- **Internationalization :**

♦ **36 Researchers of CIMA** were members of the Organizing, Scientific, Programme or Steering Committees of **International events** (see **section D**);

♦ **18 Researchers of CIMA** were PI or team members **of International Projects** (see **section G**);

♦ **4 PhD Thesis of international students** were concluded, and **16 PhD Thesis of international students** are ongoing (see **section E**);

♦ **4 Post-Doc researchers** visited CIMA and worked under supervision of CIMA's members;

♦ Many CIMA's researchers are members of International Societies, Prize Awarding Committees, International Jurys, Editorial Boards, Associated Editors, Guest Editors of Special Issues, or reviewers of international journals.

♦ Most of CIMA's elements collaborate with international researchers from all over the world, in terms of publications, communications, projects, work visits,...

More details about CIMA's structure can be seen at https://www.cima.uevora.pt/index.php

II. Research Groups

This section contains the main scientific topics in each research group.

1. Differential Equations and Optimization (DEO)

1.1. Ordinary and partial differential equations and inclusions

- Mathematical Biology: mathematical analysis of structured models of waterborne diseases
- Coagulation-Fragmentation Theory: conservation laws and theoretical analysis of models with oscillatory behaviour.
- Approximations of Hyperbolic Conservation Laws: study and classification of models physically realistic & the 6th Hilbert Problem.
- Complex Singularities and Regularisations of Conservation Laws: behaviour analysis of singularities in the complex plan and of the convergence of conservation laws weekly regularised by dissipative-dispersive perturbations.

1.2. Boundary value problems for ordinary differential equations

- Studying of the boundary value problems for high order ordinary differential equations on the real half-line or on the whole number line: the non-linear and functional cases.
- Proving of the existence of homoclinic solutions to both second and fourth order problems.
- Proving of the existence of heteroclinic solutions to semi-linear boundary value problems of the high order.
- Studying of the Hammerstein type integral equations on bounded and unbounded domains. Research of the various cases: when the kernel is either continuous or discontinuous; when it admits a constant or variable sign.
- Studying of the systems of coupled differential equations of the high order with non-linearities depending on the derivatives of the unknown functions. Application of the results to double systems of mass-spring and of two coupled beams.

- Studying of the impulse problems on compact and non-compact domains, with finite or infinite impulse moments, and with generalized impulse conditions. Applying of the results to homeostatic thyroid-mucous mechanism.

- Spectral analysis of the proper values problems of the high order.

- Sufficient conditions for the solvability of different types of coupled systems on bounded and unbounded intervals, including the periodic and functional ones.

- Multipoint resonant problems.

- Heteroclinic and homoclinic solutions.

- Generalized Hammerstein equations

1.3. Calculus of variations and optimal control

- Generalizations of the Lyapunov theorem on convexity of the range of a non-atomic vector measure.

- Decomposition of an absolutely continuous function into piecewise-cap/cup components. Applications to Lebesgue integration and to Calculus of Variations or Optimal Control.

- Developing of the dimensional reduction approach for multi-structures and in the Orlicz-Sobolev setting.

- Proving of the various integral representations in BV and Lebesgue spaces, in particular, for the Gap problem.

- Proving of the Integral as well as supreme representations for functionals with convex constraints

- Studying of the equilibrium problems for hyper-elastic materials.

- Studying of the optimal design problems for fractured materials with prescribed strain.

- Studying of a vector Variational problem with knitting boundary conditions and its application in the plastic surgery.

1.4. Non-smooth analysis

- Studying of correlations between strongly and weakly convex subsets of a Hilbert space in the non-uniform setting.

1.5. Mathematical optimization

- Development of a formula to compute the curvature of compact convex sets in R^n in different directions.

1.6. Mathematical models of fluid mechanics and applications

- Development of an algorithm of pressure-correction for compressible fluids at all levels of Mach number with co-located finite volume space discretization. Computational implementation in 1d and 2d using Fortran programming.

- Mathematical analysis and numerical methods for Partial Differential Equations modelling

the Fluid Mechanics processes. Development and analysis of 1D models (in particular, obtained via Cosserat theory) for straight and curved pipes, and their applications to hemodynamics.

- Analysis of the (in)dependence of a numerical method (of the finite elements/volumes) of the reformulation presented by Saramito on the Log-Conformation.

- Developing of an algorithm and its implementation into Python for IFR (with the instant wave-free ratio or with instant flow reserve). It was considered as a diagnostic tool for estimate whether a stenosis is the reason for blood escapement in coronary arteries with the subsequent ischemia.

1.7. Numerical methods for optimal control and multi-criteria problems with applications to regional challenges

- Analysis of an optimal control problem for a system of two hydroelectric power stations in cascade with reversible turbines where the profit of power production should be optimized under some system's restrictions reducing to the state constraints assuming the non-convexity of the cost function. The problem is solved numerically, and two different approaches are adopted. They focus on global optimization techniques (Chen-Burer algorithm) and on a projection estimation refinement method (PERmethod). Results and execution time of the two procedures are compared.

- A framework was proposed for obtaining homogenous territorial clusters based on a max-p-regions optimization problem by considering multiple criteria related to endogenous resources, economic profile and socio-cultural features of territories. This framework is developed in three steps. First, the dissimilarity criteria correlated with development at the territorial unit level are identified, using a multiple linear regression analysis. Then, a multi-criteria max-p-regions model is developed, in order to allocate each territorial unit (parishes) to a territorial agglomerate. Finally, the max-p-model is used to generate alternative efficient district maps according to the changes in the threshold of spatial attributes.

- Studying of the forested landscape-level management, planning and the provision of ecosystem services. The research focused on the potential of combining participatory workshops and multiple criteria decision methods (MCDMs) to support the development and negotiation of targets for the supply of ecosystem services and help design the management plan needed to meet those targets. The results are applied to two forested landscapes with several ownership types in Portugal. The approach encompassed the design of two workshops involving more than 40 stakeholders (forests owners, the forest service, the forest industry, local municipalities and other nongovernmental organizations). The list of ecosystem services included carbon stocks, cork, pine cones, and forest inventory at the end of the planning horizon as well as volume flows from a range of forest species. Results demonstrated the potential of MCDM tools to help individual forest stakeholders set and adjust ecosystem services target levels. They further demonstrated the potential of MCDMs to facilitate the negotiation of these targets by the stakeholders and the reaching of meaningful solutions. Finally, they demonstrated that these tools provide valuable information to combine the negotiations of both targets and behaviors and programs needed to attain them.

2. Dynamical Systems (DS)

- Development of forest management scheduling models that address wildfire risk, both at stand and landscape levels, with the incorporation of concerns regarding the diversity of species in the stands, regularity of volume, wildfire resistance or adjacency constraints. This research is applied to the Zona de Intervenção Florestal (ZIF) de Paiva and de Entre-Douro e Sousa (ZIF_VS) that is in northwestern Portugal.

- Study of the dynamic of coupled beings and its application to human and society behaviors; work on progress.

- The research focused on applying advanced mathematical modeling, numerical methods, and machine learning to solve complex problems in solid mechanics, oncology, and data processing. Key areas include:

1. Solid Mechanics and Neural Networks:

Developed models for simulating stress and strain in solid mechanics directly from images using convolutional neural networks.

2. Cancer Modeling:

Utilized Physics-Informed Neural Networks (PINNs) to model tumor growth and immunotherapy, analyzing metabolic flux and competition dynamics in cancer metastasis.

3. Data Processing and Automation:

Implemented automatic recognition of tables in documents using advanced algorithms, enhancing data extraction and processing.

4. Numerical Methods and Heat Conduction

Solved heat conduction problems in irregular domains using a combination of PINNs and fictitious domain methods.

5. Image Mesh Generation

Proposed mathematical approaches for generating image meshes using Delaunay triangulation, improving computational efficiency in imaging applications.

The research activities in 2024 were primarily focused on low-dimensional discrete dynamical systems, with a particular emphasis on studying the Lozi and Hénon maps.

One significant line of investigation involved a practical application of a Lozi-type strange attractor. The study analyzed a prototype suspended load system, consisting of a horizontally moving cart with an attached pendulum. The system was subjected to piecewise linear control driven by a cart speed control signal. Through careful selection of system parameters, the dynamic control of the motion was studied, and the complexity of the system was characterized. This work demonstrated the utility of chaotic attractors in real-world dynamic control applications.

Another key area of research focused on the use of lifting devices in industrial

operations, such as logistics, construction, and port activities. A laboratory test rig was employed to investigate the energy consumption associated with controlling suspended loads. The research compared various control methods, including proportional-integral-derivative (PID) control, pole placement, and optimal control, to assess their energy efficiency. The comparative analysis provided insights into the most sustainable and efficient strategies for industrial load management. These findings are expected to contribute to the optimization of energy usage and promote sustainability in industrial processes.

3. Logic, Algebra and Geometry (LAG)

3.1 Logic of changing beliefs

Generalizations of the Levi and Harper Identities, which are suitable to the context of non-prioritized operators of belief change defined on belief bases .

- **3.2 Logic**

  - Logic for contrary-to-duty conditionals, showing how to adjust our logical models in such a way as to avoid the counterintuitive results pointed out by Bjørn Kjos-Hanssen, but keep the main results that support logical analysis of contrary-to-duty (CTD) scenarios.
  - Proof Mining, information obtained on the strong convergence of the Halpern-Mann algorithm in the context of CAT(0) spaces.
  - Theory of scales and on the semantics of vague adjectives. The models of this theory are necessarily Non-standard leading to denominate philosophical conception as *non-standard primitivism*.
  - Characterization of definable Skolem functions and its relationship with trichotomy in the context of o-minimal structures.
  - Hybrid logic with varying domains, extending the hybrid logic by Martins, Manzano and Blackburn.

3.3 Neutrices and external numbers

- Polynomials with external numbers: influence of errors in the coefficients on the roots of polynomials.

3.4. Flexible linear algebra and optimization (Imme van den Berg)

- .Flexible systems of linear equations or inclusions.

3.5. Active learning in teaching of Mathematics in higher education

Active learning in Mathematics teaching in higher education.

3.6. Artinian Jordan Algebras e Algebras of Gorenstein of codimension 4

- Artinian algebras and Jordan type.

Generalisation of results on bounds for the Jordan type of Artinian algebras, to the cases of non-graded algebras, and algebras with a non-standard grading, and free extensions .

- Jordan type and related invariants of Artinian algebras derived from the Jordan type, and their relation to deformations
- Artinian Gorenstein algebras of embedding dimension four and socle degree three.
- Higher Lorentzian Polynomials, Higher Hessians, and the Hodge-Riemann relations for codimension two graded Artinian Gorenstein algebras.
- Hodge-Riemann relations (HRR) for graded Artinian Gorenstein (AG) algebras, and classification of those AG algebras in codimension two satisfying the HRR in terms of their Macaulay dual generators .

3.7. Study of monads on smooth projective varieties

- Monads on smooth projective varieties whose bounded derived category of coherent sheaves has a semi-orthogonal decomposition

3.8. Vector bundles on the 3-dimensional projective space

- Existence of vector bundles E on the 3-dimensional projective space defined by a linear resolution and homological dimension 2, and such that the Euler characteristic of the bundle End(E) is one .

3.9. Decomposition of anti-symmetric tensors

- Study of the fundamental exterior system of Riemannian Geometry and applications

3.11 Numerical semigroups

- Invariants of numerical semigroups: the multiplicity, embedding dimension, degree of singularity, conductor, Apery sets, pseudo-Frobenius number and type.

4. Statistics, Stochastic Processes and Applications (SSPA)

- **Green Measures**. We investigated the Green measure for a class of non-Gaussian processes in $\mathbb{R}^d$, associated with the family of generalized grey Brownian motions, in particular, fractional Brownian motion, and other non-Gaussian processes.

- **A Kuramoto Model for the Bound State Aharonov–Bohm Effect**. The Aharonov–Bohm effect can be described as a phase difference in interfering charged particles that travel through two distinct pathways oppositely surrounding a perpendicularly-positioned solenoid. The magnetic field emanates from the solenoid does not intersect the pathways. The Kuramoto model can be used to identify the synchronization conditions that lead to aparticular phase difference by treating the phases as coupled oscillators.

- **Kawasaki dynamics of continuous particle systems in infinite volume**. An infinite particle system of independent jumping particles in infinite volume is considered. Their construction is recalled, further properties are derived, the relation with hierarchical equations, Poissonian analysis, and second quantization are discussed.

- **Cameron-Martin type theorem for a class of non-Gaussian measures**. We study the quasi-translation-invariant property of a class of non-Gaussian measures. These measures are associated with the family of generalized grey Brownian motions. We identify the Cameron-Martin space and derive the explicit Radon-Nikodym density in terms of the Wiener integral with respect to the fractional Brownian motion.

- **Fox-H densities and completely monotone generalized Wright functions**. Explicit assumptions that allow us to use the Fox-H functions as densities, and provide a subfamily of the latter, called Fox-H densities with moments of any order, and give their Laplace transforms as entire generalized Wright functions. functions, we derive asymptotic results and their analytic extension.

- **Mixed stochastic differential equation models** for system of bovine raising for meat individual growth: study of new approximate delta method of parameters' estimation and its comparison with previous approximate methods (including a generalized version of Laplace approximation method with no restrictions on observation times), and a generalization to maturity size parameter dependence on the individual genetic values: properties of the models, parameter estimation, testing significance of genetic values, application to bovine growth.

- **General stochastic differential equatio**ns growth and fishing models with Allee effects: conditions for extinction and existence of a stationary distribution with general autonomous natural growth with Allee effects and general autonomous harvesting efforts, as well as extension to general autonomous bounded noise intensities; conditions on harvesting efforts for particular cases using stochastic versions of specific widely used models.

- **Evaluation, through simulation studies**, of methods for testing (retrospectively) breaks or changes in structure in time series, at unknown moments, including determining the number of these breaks as well as the confidence intervals of break dates.

- **Parameter estimation for rare events**, such as the extreme value index (EVI), the conditional tail estimator (CTE), and the Weibull tail coefficient (WTC), among others. Developp of new estimators with reduced bias and asymptotic mean squared error. Apply extreme value methodologies to the study of air quality and its relationship with human mortality prediction.

- **Application of GLM, GLMM, and GAMM models** to an experimental design with Pasteur height, crude protein, and neutral detergent fiber as the response variables. This work contributes to understanding the relationships between different types of grazing in dryland pastures, with and without application of dolomitic limestone, and preferred grazing locations for sheep.

- **Logistic regression models** to contribute to the development of three different types of chocolate enriched with seaweeds. Two different product-characterization and consumer segmentation profiles were developed, one emotional profile, and one combined sensory and emotional profile.

- Study of **Phytoplankton dynamics** and **cyanobacteria blooms risk assessment** in a large reservoir (Alqueva reservoir, Southern Portugal), specifically in the statistical treatment of data provided by the company EDIA, S.A.

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III. Research Lines

This chapter details the main research topics and tasks of each research line.

Mathematical Modelling in Life Sciences and Applications (MMLSA)

Animal Growth, Fishery and Crop Production

- Mixed stochastic differential equation models for individual growth: generalisation to parameter dependence on the individual genetic values; study of a new approximate delta method of parameters' estimation and its comparison with previous approximate methods.
- Study of general stochastic differential equation growth and fishing models with Allee effects: conditions for extinction and existence of a stationary distribution with general autonomous natural growth with Allee effects and general autonomous harvesting efforts; further generalisation to the case of density-dependent intensity effects of environmental noise.
- Study the recreational fishing to gather socioeconomic and biological information on shore angling fisheries in the Natural Marine Park of the Algarve Reef.
- Determination of how correction with dolomitic limestone and continuous or deferred grazing affect ingesting behaviour and the use of space in natural pastures when the pasture growth rate is maximum.

Epidemiology and Public Health

- Analysis of factors associated with depression and anxiety symptoms among university students in Portugal, Sweden, and Germany.
- Validation of the Medication Management Ability Assessment and determination of the level of functional ability of older adults to manage a simulated therapeutic regimen.
- Assessment of the impact of implementing a "Geriatric Proximity" intervention on the functioning, satisfaction with social support, affective experience, and feelings of loneliness of institutionalized older adults in the times of the pandemic.
- Validation of pharmaceutical pictograms from the "PictoPharma – Pharmaceutical pictogram system" database in the elderly population
- Classification of time series based on their similarity/dissimilarity measures, considering different structures of dependence between observations, exploring the difference between raw or with certain transformations, with applications in infectious diseases.
- Study of differences in knowledge about sexuality depending on sexual orientation.

- Collaboration with the Water Laboratory team at the University of Évora in the study of Phytoplankton dynamics and cyanobacteria blooms risk assessment in a large reservoir (Alqueva).
- Relationship between the nursing work environment and the quality of pressure ulcer care in integrated continuing care units in Alentejo.
- Characterization of the sleep and physical activity and sports habits of Portuguese elementary school children and identification of factors related to the child's sleep disturbance index and respective subscales.
- Statistical modelling of attendance at Emergency Service of the Hospital do Espírito Santo (HESE) de Évora; Profile of the hyper user of the emergency service.

Food

- Identification of sensory and emotional profiles and customer segmentation of three different types of Seaweed bonbons, to find sensory drivers of liking.

Safety and human well-being

- Development of a predictive model for the occurrence of Road Traffic Accidents (RTA).
- GIS tools were combined with artificial intelligence, developing spatial intelligence and providing decision-makers and authorities to foster new approaches to the prevention and mitigation of the occurrence of RTA.
- Several determinants for the type of RTA (collision, crash, pedestrian running-over were identified.
- Analysis and evaluation of faults at tide gauge stations based on the Crow-AMSAA model and survival models.

Mathematics and Applications to Technology and Industry (MATI)

Communication and social networks

Motivated by data packet sampling problems in communication networks such as the Internet, the research work consists of an inversion problem. Since these problems are ill-posed, regularization methods are needed for their solution. Through these methods, the size distribution of the Internet packet flow was estimated and a Gaussian TLC was deduced for the estimator obtained directly from the properties of the underlying operator.

Sensory and emotional profiles

Identification of sensory and emotional profiles and customer segmentation of three

different types of Seaweed bonbons, to find sensory drivers of liking

Faults at tide gauge stations

Analysis and evaluation of faults at tide gauge stations based on the Crow-AMSAA model and survival models.

Road Traffic Accidents (RTA)

A methodology has been developed to allow for archive a predictive model for the occurrence of Road Traffic Accidents (RTA) on a road with a high RTA rate (the prediction is obtained for each road segment for a given time and day and combines results from statistical methods, spatial analysis, and artificial intelligence models).

E1 The results obtained with this new approach provide new insights and more profound knowledge of the RTAs problem. And provide 'food for thought' for decision-makers and authorities to foster new approaches to the prevention and mitigation of an important societal concern.

E2 Several determinants for the type of RTA (collision, crash, pedestrian running-over were identified (multinomial logit model with random over-sampling examples approach- ROSE - which performance were compared with some machine learning algorithms).

Machine learning and artificial intelligence

E3 GIS tools were combining with machine learning and artificial intelligence, developing spatial intelligence (departing from a heatmap analysis, and applying kernel density estimation, new spatial approaches were used, namely DBSCAN and Getis-Ord).

Composite materials

Development of composite materials, using clay, celulosis and other raw materials, for bio-climatization of buildings. A paper on the subject is planned and several prototypes of building materials).

Mini ecosystems

Mini ecosystems – Experimental setup. New systems will be established, arising from previous ones.

Robotic motion

Study of robotic motion using the dynamical model introduced in previous year. Development of the interaction model between robots. Codification of tasks and strategies. Experimental, computational and theoretical work.

Cryptographic systems

Study of cryptographic systems using cellular automata and chaotic discrete dynamical systems

Dynamical systems

Study of dynamical systems, deterministic or probabilistic, applied to image processing. In particular applied to image of rocks to study fractures.

Oscillations on non-homogeneous materials

Study of oscillations on non-homogeneous materials. Coupling of harmonic oscillators.

Virtual Reality

- Project "Virtual Reality in the Social Inclusion of the Elderly" with several IPSS (Social Solidarity Private Institution): improve the physical, social and emotional conditions of the elderly. This improvement will be achieved through the implementation of a program, adapted to each reality and each individual (in depression or anxiety) through technology based on Virtual Reality, with experiences that promote the well-being and quality of life of the elderly, providing a positive social integration and promoting active and happy aging.

IV. 2023 Indicators

A – Publications

A.1. Books

Books (author) of international circulation:

A1 **Diogo Baptista**, (2024) "Markov partition in the attractor of Lozi maps", in *Lozi, Hénon and Belykh Chaotic Attractors New Results Fifty Years On,* 1st Edition, CRC Press, pp. 83-95, eBook ISBN 9781003568643, https://www.taylorfrancis.com/chapters/oa-edit/10.1201/9781003568643-6/

Books (editor) of international circulation:

A2 Advanced Mathematical and Computational Tools in Metrology and Testing XIII, *Series on Advanced in Mathematical for Applied Sciences – Vol. 94*, Editors: F. Pavese, A. Bosnjakovic, S. Eichstaedt, A. B. Forbes, **J. A. Sousa**, World Scientific, 2024. ISBN: 978-981-98-0066-7. https://www.amazon.com/Advanced-Mathematical-Computational-Metrology-Mathematics-ebook/dp/B0DSYZJWF9

A3 Tomáš Bodnár, Philippe Fraunié, David Simurda, Elfriede Friedmann, Marília Pires, SSN Applied Sciences, Topical Collection: Engineering - Recent Problems in Fluid Mechanics, Springer, Volume 5, https://link.springer.com/collections/jjdeiijfic

Books (author) of national circulation:

A4 **SILVA, Domingos J. L.** (2024). Statistics Applied to Sports Sciences – Exploratory Data Analysis. 2nd edition, revised and expanded. Statistical Concept – Statistical Analysis Center. Bookmundo.

A5 **SILVA, Domingos J. L.** (2024). Introduction to Data Manipulation and Visualization with the R Language. 2nd edition, Statistical Concept – Statistical Analysis Center. Bookmundo.

A6 New Frontiers in Statistics and Data Science, SPE2023, Guimarães, Portugal, October 11-14, Editors: **Lígia Henriques-Rodrigues**, Raquel Menezes, Luís Meira Machado, Susana Faria, Miguel de Carvalho. XIII, 456. https://doi.org/10.1007/978-3-031-68949-9, 978-3-031-68948-2 (Due: 11 February 2025) https://link.springer.com/book/10.1007/978-3-031-68949-9

Books (editor) of national circulation:

A7 Jovens e educação sexual: contextos, saberes e práticas. Editores: Maria Manuel Vieira, Duarte Vilar, Vanessa Cunha, Tatiana Ferreira, Paulo Pelixo, Paula Pinto, Ana Sampaio, **Dulce Gamito Pereira**. Lisboa: Imprensa de Ciências Sociais, Dezembro 2024. 260 p. ISBN 978-972-671-797-3; PDF: 978-972-671-799-7; EPUB: 978-972-671-798-0

A8 Anjos, A., Minhós, F., Carapau, F., Bezzeghoud, M., F., Correia, P., Oliviera, R., Abreu, S.: Book of Abstracts: 2nd International Workshop on Mathematics and Physical Sciences, CIMA-UÉ, Universidade de Évora, 108pp, ISBN: 978-972-778-400-4, 2024

Book chapters of international circulation:

A9 Imme van den Berg, Elementary nonstandard axiomatic systems and standard real numbers, 25p., accepted for Advances in Mathematical Modeling in Science, Engineering and Social Sciences, Trends in Mathematics, Springer-Birkhäuser.

A10 Gomes, M.I., Caeiro, F., **Henriques-Rodrigues, L.** (2025). Peaks Over Random Thresholds (PORT) Estimation of the Weibull Tail Coefficient. In: Henriques-Rodrigues, L., Menezes, R., Machado, L.M., Faria, S., de Carvalho, M. (eds) New Frontiers in Statistics and Data Science. SPE 2023. Springer Proceedings in Mathematics & Statistics, vol 469. Springer, Cham. https://doi.org/10.1007/978-3-031-68949-9_17

A11 Caeiro, F., Gomes, M.I., **Henriques-Rodrigues, L.** (2025). A Partially Reduced Bias Hill Estimator of the Extreme Value Index. In: Henriques-Rodrigues, L., Menezes, R., Machado, L.M., Faria, S., de Carvalho, M. (eds) New Frontiers in Statistics and Data Science. SPE 2023. Springer Proceedings in Mathematics & Statistics, vol 469. Springer, Cham. https://doi.org/10.1007/978-3-031-68949-9_20

A12 **Henriques-Rodrigues, L.**, Gomes, M.I., Figueiredo, F., Caeiro, F. (2025). A New Class of Conditional Tail Expectation Estimators. In: Henriques-Rodrigues, L., Menezes, R., Machado, L.M., Faria, S., de Carvalho, M. (eds) New Frontiers in Statistics and Data Science. SPE 2021. Springer Proceedings in Mathematics & Statistics, vol 469. Springer, Cham. https://doi.org/10.1007/978-3-031-68949-9_22

A13 de Carvalho, M., Lee, J., Palacios, V. and **Henriques-Rodrigues, L.** Regression models for extremes, Chapter 6, part II, in Raphael Huser, Philippe Naveau, Brian Reich and Miguel de Carvalho (Editors), Chapman & Hall / CRC Handbook on Statistics of Extremes. (accepted - to appear in 2025).

A14 E. Batista, **J. Alves e Sousa**, Andrea Malengo, David Torchio, Olaj, Schnelle-Werner, Urska Turnsek, Georgia Harris (2024). Evaluation of repeatability measurement procedures in gravimetric volume calibrations of glassware, Series on Advanced in Mathematics for Applied Sciences, *Advanced and Computational Tools in Metrology and Testing XIII*, **Vol. 94**, ISBN: 978-981-98-0066-7.

A15 Sousa-Ferreira, I., **Abreu, A. M.** e Rocha, C. An additive shared frailty model for recurrent gap time data in the presence of zero-recurrence. Subjects in New Frontiers in Statistics and Data Science, vol. 469. Springer Proceedings in Mathematics & Statistics. First edition. Springer Cham, 15 pages, ISBN: 978-3-031-68948-2. To appear

A16 Coelho, C. A., Alberto, R. P. and **Grilo, L. M.** (2024). When Do the Moments Uniquely Identify a Distribution. Springer Nature Singapore Pte Ltd., Directional and Multivariate Statistics. Edited by Somesh Kumar, Barry C. Arnold, Kunio Shimizu and Arnab Kumar Laha. (accepted and waiting for publication)

Book chapters of national circulation:

A17 .Pelixo, P., Sampaio, A, **Pereira, D. G.** (2024). Diferenças nos conhecimentos dos/as jovens sobre sexualidade em função da orientação sexual. In: Vieira, M. M., Vilar, D., Cunha, V., Fereira, T. Pelixo, P. Pinto, P. Sampaio, A. Pereira, D. G. (eds) Jovens e educação sexual: contextos, saberes e práticas. Imprensa de Ciências Sociais. 121-139, ISBN 978-972-671-797-3

A.2. Scientific articles

Articles in international journals with referee

A18 Carvalho L, Diogo C, Mendes S, Soares H, *A note on the essential numerical range of block diagonal operators*, Forum Mathematicum, vol. 36, 1147-1157, online ISSN 1435-5337, doi:10.1515/forum-2023-0166 , https://www.degruyter.com/document/doi/10.1515/forum-2023-0166/pdf?srsltid=AfmBOorwvHG9hVQOchx4CkcpCwzjThbpw7PKXi9_G8uD_xCThxZE-k5v

A19 Carvalho L, Diogo C, Mendes S, Soares H, *On the convexity of the quaternionic essential numerical range*, Proceedings of the Edinburgh Mathematical Society, vol. 67, 838-851, online ISSN 1464-3839, doi:10.1017/S0013091524000336 ., https://www.cambridge.org/core/journals/proceedings-of-the-edinburgh-mathematical-society/article/on-the-convexity-of-the-quaternionic-essential-numerical-range/D742A7CE4085770FB10F0E0E85AC8F2E

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A112 Marília Pires e Tomáš Bodnár, Numerical Stabilization of Oldroyd-B Fluids Flows Using Local Artificial Diffusion, ENUMATH2023, European Conference on Numerical

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Proceedings of national events

A113 **José Alberto Rodrigues,** Solving Steady-State Heat Conduction in Irregular Domains Using Physics-Informed Neural Networks and Fictitious Domain Method, .IX Workshop on Computational Data Analysis and Numerical Methods (WCDANM), September 5-7, 2024, University of Évora, Portugal. https://www.wcdanm2024.uevora.pt/wp-content/uploads/2024/10/BoA_WCDANM_2024.pdf

A114 **José Alberto Rodrigues** Numerical Studies on the Effect of Shear Stress During the Metastasis Process, CIMA Annual Meeting, February 2-3, 2024. http://ccm.uma.pt/cima2024/downloads-2/files/Livro_Resumos_CIMA__Final.pdf

A.4. Edited special issues of journals

A115 U.C. Ji, **da Silva, J.L.**, & A. Stan. Special issue of Journal of Stochastic Analysis (JOSA) in memory Professor Habib Ouerdiane. December 2024. To appear

B – Communications

Communications at international events

B1. Carvalho L, Diogo C, Mendes S, Soares H, *Quaternionic essential numerical range of complex operators*, 35th International Workshop on Operator Theory and its Applications, August 12-16, University of Kent, https://blogs.kent.ac.uk/iwota2024/ , https://blogs.kent.ac.uk/iwota2024/files/2024/08/S15-3.pdf

B2. Imme van den Berg, *A comprehensive model for computation and measurement numbers*, 2nd International Workshop on Mathematics and Physical Sciences (MatPhys) July 11-12, 2024, Évora (https://www.2iwmps24.uevora.pt/)

B3. Bruno Dinis, Jaime Gaspar - *Factorisation of the classical nonstandard bounded functional interpretation* - 2nd International Workshop on Mathematics and Physical Sciences, 11-12 July 2024 - Universidade de Évora (https://www.2iwmps24.uevora.pt/)

B4. **Grilo, L. M.** (2024). Modeling the reflective higher-order construct 'student burnout' using the disjoint two-stage approach with PLS-SEM. IX Workshop on Computational Data Analysis and Numerical Methods (IX WCDANM), University of Évora, Évora, September 05-07 (p. 42 of the book of abstracts). https://www.wcdanm2024.uevora.pt/book-of-abstracts /

B5. **Grilo, L. M.** (2024). Statistical modelling of burnout in college students as a second order construct. 2nd International Workshop on Mathematics and Physical Sciences (IWMPS), University of Évora, Évora, July 11 12 (p. 50 of the book of abstracts). https://www.2iwmps24.uevora.pt/book-of-abstracts/

B6. **Grilo, L. M.**, Braz, T. F., Grilo, H. L., Maidana, J. P. and Stehlík, M. (2024). PLSc-SEM to Evaluate the Facets of Burnout in Lisbon Airport Border Officers. CIMA Annual Meeting 2024, University of Madeira, Funchal, Madeira, February 02-03 (pp. 16-17 of the abstract book). http://ccm.uma.pt/cima2024 /

B7. **da Silva, J.L.** Green Measures for Markov Processes With Non-Local Generators. 10th Jagna International Workshop: Uncovering Patterns in the Evolution and Structure of Natural and Social Phenomena, January 8-11, 2024, jagna, Bohol, Philippines
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B8. **da Silva, J.L.** Cameron–Martin Type Theorem for a Class of non-Gaussian Measures..4th Italian Meeting on Probability and Mathematical Statistics, June 10-14, 2024, Rome, Italy, https://probabilityrome2024.it/pr2024/papers/280/

B9. **da Silva, J.L.** Green Measures for (Non) Markov Processes. Non-Local Generators and Singular Kernels, Linnaeus Workshop on Stochastic Analysis and Applications 2024. July 1-5, 2024, Växjö, Sweden
https://lnu.app.box.com/s/f99tvswzyw6dzb0tzhy9vdlazlomx1w2

B10. **Abreu, A. M.** and Sousa-Ferreira, I. (presenter) (2024). ecpdist: an R package for the extended Chen-Poisson lifetime distribution, IX Workshop on Computational Data Analysis and Numerical Methods, Évora-Portugal, July 5, 2024, WCDANM 2024, Abstract in: Book of Abstracts, p. 110, BoA_WCDANM_2024.pdf

B11. Pires C., Bailoa S., **Cantarinha A.**, Baetas C., (2024). *Determinants of Green Bonds in Energy European companies Performance.* Euro-Mediterranean Conference for Environmental Integration (EMCEI-24), May 15-18, Marrakech, Morocco, https://2024.emcei.net/

B12. Pires C., Bailoa S., **Cantarinha A.**, Almeida N., (2024). *The Effect of Capital Structure on Firm Value: A Study of Companies Listed on PSI20 and IBEX35. Proceedings of the International Conference of Applied Business and Management,* ICABM2024 - International Conference of Applied Business and Management, organized by the ISAG-European Business School and Research Center in Business Sciences and Tourism (CICET), June 20-21, Porto, Portugal, https://icabm24.isag.pt/, Book of Abstracts, p. 215 https://icabm24.isag.pt/livro-de-atas/.

B13. Pires, C., Bailoa, S., **Cantarinha, A.** (2024). *Determinants of Banks Profitability: Evidence from Portugal. Proceedings of the International Workshop on Accounting and Taxation (IWAT2024)*, April 12, Porto, Portugal, IWAT 2024 – International Workshop Accounting and Taxation, Book of Abstracts, p.212 Book of Proceedings – IWAT 2024.

B14. **Jamba, N. T.** (poster communication presenter); **Filipe, P. A.**; **Jacinto, G.**; **Braumann, C. A.** Stochastic differential equations mixed model with Inclusion of genetic values. 15th International Conference on Dynamical Systems Applied to Biology and Natural Sciences - DSABNS 2024, February 6-9, 2024, FCT/UNL, Caparica, Portugal, https://sites.google.com/view/dsabns2024/home
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B15. **Braumann, C. A.** (presenter); **Filipe, P. A.**; **Jacinto, G.**; **Jamba, N. T.** Sources of Variability in Individual Growth: A hierarchical class of stochastic models.
Models in Population Dynamics, Ecology, and Evolution (MPDEE'24), April 15-19, 2024, University of Leicester, UK, https://web.mat.bham.ac.uk/N.B.Petrovskaya/MPDEE24.htm
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B16. **Jacinto, G.** (presenter); **Filipe, P. A.**; **Jamba, N. T.**; **Braumann, C. A.** Exploring variability in individual growth: introducing a hierarchy of stochastic models.
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B17. **Jamba, N. T.** (presenter; online talk); **Filipe, P. A.**; **Jacinto, G.**; **Braumann, C. A.** Stochastic differential equations mixed model for individual growth with inclusion of genetic values.

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B18. **Braumann, C. A.** (presenter; presencial talk); Brites, N. M.; **Carlos, C.** SDE harvesting models for populations in randomly varying environments: Impact of Allee effects.

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B20. Faria, M., Andrade, R., Bonfim, R., Naves, E., Lopes, L., Arcêncio, R., Bolella, V., Rujula, M., **Dulce Gomes**, Monroe, A. Repercussões da pandemia de covid-19 na tendência temporal de indicadores de acesso ao diagnóstico da tuberculose: revisão sistemática. 59º Congresso da Sociedade Brasileira de Medicina Tropical (MEDTROP). 22-25 de Setembro de 2024, São Paulo (Brasil). https://medtrop2024.com.br/

B21. Tavares, R., Berra, T., Alves, Y., Tártaro, A., Vigato, B., Pelodan, M., Paiva, J., Campos, M., Popolin, M., **Dulce Gomes**, Arcêncio, R. Impacto da pandemia de COVID-19 nas taxas de mortalidade por tuberculose no Brasil: estudo de série temporal (2012-2022). 59º Congresso da Sociedade Brasileira de Medicina Tropical (MEDTROP). 22-25 de Setembro de 2024, São Paulo (Brasil). https://medtrop2024.com.br/

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B23. **Lígia Henriques-Rodrigues**, Frederico Caeiro and M. Ivette Gomes. A comparative study of several classes of reduced-bias extreme value index estimators with applications. IX WCDANM (Workshop on Computational Data Analysis and Numerical Methods), Évora, 05-07 September 2024. https://www.wcdanm2024.uevora.pt

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B24. **Lígia Henriques-Rodrigues**, Frederico Caeiro and M. Ivette Gomes. Accounting for Bias in Extreme Value Index Estimation: Applications in Environmental Science. 2nd International Worshop on Mathematics and Physical Sciences (MatPhys24), Satellite Conference of the 9th European Congress of Mathematics of the European Mathematical Society, July 11-12, 2024, University of Évora, Portugal, https://www.2iwmps24.uevora.pt/

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B28. **Luís Silva**, Attractors and Complexity on Pattern Iterations of Flat-Topped Tent Maps, MathPhys 24, Évora, 11-12 July 2024, 2nd International Workshop on Mathematics and Physical Sciences Book-of-Abstracts.pdf

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B42. Feliz Minhós, "***Semi-linear impulsive coupled systems: Existence and localization of solutions***" , 14th AIMS Conference, Special Session 109: Differential, Difference, and Integral Equations: Techniques and Applications, https://aimsconference.org/AIMS-Conference/conf-reg2024/ss/changeApp12.php?ssid=109 , Abu Dhabi, United Arabic Emirates Unidos, from 16 to 20/12/2024.

B43. F. Carapau, P. Correia., Scientific Meeting of Mathematics and Applications, Universidade da Beira Interior, 26 September, 2024, Portugal, Numerical simulations of a third-grade fluid flow on a tube through a contraction

B44. Marília Pires e Tomáš Bodnár, Localized numerical stabilization based on conformation tensor spectrum for viscoelastic fluids flows simulations, Algoritmy2024 - Central-European Conference on Scientific Computing. Mini-Simpósio Computational methods and algorithms for biomedical applications, High Tatra Mountains, Slovakia. March 15 – 20, 2024 https://www.math.sk/alg2024/minisymposia-abstracts/#biomedical_applications

B45. F. Pereira, Directional curvatures for implicitly defined subsets of R^n, The Cape Verde International Days on Mathematics 2024, CVIM 2024, September 2-6, 2024, Praia (Cabo Verde),https://sites.google.com/view/cvim24/home
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B49. Bruno Dinis, Pedro Pinto, *On the computational properties of fixed point methods with set-valued mappings,* Workshop on Proof Mining 24, TU Darmstadt, Germany (https://sites.google.com/view/wpm24)

B50. Bruno Dinis - *Nonstandard Analysis meets Philosophy*, June 26, 2024, Colloquium of Logic, Instituto Superior Técnico ULisboa.

B51. Marco Garapa, Eduardo Fermé and Maurício D.L. Reis; *Levi and Harper identities for non-prioritized belief base change*; 27th European Conference on Artificial Intelligence, 19-24 October 2024, Santiago de Compostela, Espanha, https://www.ecai2024.eu/ https://www.ecai2024.eu/programme/accepted-papers#journal-track

B52. Abhaya Nayak, Eduardo Fermé, Marco Garapa and Maurício D.L. Reis; *Relevance, recovery and recuperation: A prelude to ring withdrawal*, Knowledge Representation and Multiagent Systems Conventicle, 13 – 14 May 2024, School of Computer Science and Engineering, University of New South Wales, https://cgi.cse.unsw.edu.au/~mit/krmascon24.html , https://cgi.cse.unsw.edu.au/~mit/KRMASCON24-SLIDES/AbhayaNayak.pdf

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B54. Manuel Branco, *Arithmetic varieties of numerical semigroups* - International Meeting on Numerical Semigroups Universidad de Cadiz 8-12 july 2024.

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B57. **da silva, J.L.** Cameron–Martin Type Theorem for a Class of non-Gaussian Measures, 8th Annual Convention of Mathematical Society of the Philippines (MSP) Regions X, XII and BARMM, October 28-30, 2024, Bukidnon State University, Malaybalay City, Bukidnon https://www.msuiit.edu.ph/announcements/detail.php?id=787

B58. **Braumann, C. A.** (Invited lecture). Are populations in random environments following itô or stratonovich calculus? Does it matter ?, 15th International Conference on Dynamical Systems Applied to Biology and Natural Sciences - DSABNS 2024, February 6-9, 2024, FCT/UNL, Caparica, Portugal, https://sites.google.com/view/dsabns2024/home

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B59. **Braumann, C. A.** (Invited speaker); **Filipe, P. A.**; **Jacinto, G.**; **Jamba, N. T.** Individual growth: Detection of different sources of variability using a hierarchical class of SDE models. **,** 6th International Workshop on Branching Processes and their Applications - IWBPA 2024, April, 8-12, 2024 Badajoz, Spain, https://sites.google.com/view/iwbpa24

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B60. **Braumann, C. A.** (Invited Plenary speaker, presential); **Carlos, C.**; Brites, N. M. General stochastic differential equation models for population growth and harvesting in random environments: Sustainability, optimization and impact of Allee effects.

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B61. **Braumann, C. A.** (Invited Plenary Keynote talk; online). Applications of stochastic differential equations in Biology. 1st International Congress of Applied Mathematics and Artificial Intelligence (ICAMAI'24), hybrid conference, July 1-3, 2024, Faculty of Sciences Dhar El Mahraz, University Sidi Mohamed Ben Abdellah, Fez, Morocco, https://icamai24.sciencesconf.org/?lang=en/

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B62. **Braumann, C. A.** (Invited plenary speaker); Brites, N. M. Harvesting populations in random environments: Shortcomings of the optimal harvesting policy, proposal of alternatives, and their assessment.

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B63. **Lígia Henriques-Rodrigues**, Frederico Caeiro and M. Ivette Gomes. New Classes of Reduced-Bias Generalized Hill Estimators'. Invited oral presentation at the 2024 IMS International Conference on Statistics and Data Science (ICSDS), 16-19 December 2024, Nice, France, https://sites.google.com/view/ims-icsds2024/full-program?authuser=0

Communications at national events

B64. Manuel Branco, *Arithmetic varieties of numerical semigroups*, The 14th Combinatorics Days - Universidade NOVA de Lisboa, Almada June 27-29, 2024 .

B65. **Grilo, L. M.** (2024). Students' burnout as a higher order construct: the DWLS estimation procedure. XXXI Jornadas de Classificação e Análise de Dados (JOCLAD 2024), Polytechnic Institute of Leiria, Leiria, Portugal, Abril 18 20 (p. 123, Programme and Book of Abstracts). https://abrir.link/LWtMQ

B66. Arone, S. G., Nunes, C. S. and **Grilo, L. M.** (2024). The Holt-Winters method to estimate currency in circulation in Mozambique. XXXI Jornadas de Classificação e Análise de Dados (JOCLAD 2024), Polytechnic Institute of Leiria, Leiria, Portugal, 18-20 de abril (p. 165, Programme and Book of Abstracts). https://abrir.link/LWtMQ

B67. **Abreu, A. M.** (presenter), Sousa-Ferreira, I. and Rocha, C. (2024). Inclusion of a shared frailty in gap time models. Annual Meeting, CIMA, 2024, Funchal-Portugal, February 2-3, 2024, CIMA-metting2024 | CIMA - Centro de Investigação em Matemática e Aplicações
Abstract in: Book of Abstracts, p. 1, Livro_Resumos_CIMA__Final.pdf

B68. **Afonso, A., Pereira, D. G.** (2024). *Alternative approaches to parametric 2-way ANOVA*. CIMA Annual Meeting 2024, 2-3 fevereiro, Universidade da Madeira, Funchal (online). http://ccm.uma.pt/cima2024/. *Book of abstracts. CIMA - Centro de Investigação em Matemática e Aplicações. Annual Meeting 2024*, 2. http://ccm.uma.pt/cima2024/downloads-2/files/Livro_Resumos_CIMA__Final.pdf

B69. **Pereira, D. G. , Afonso, A.**, Gonçalves, A. C. (2024). *Generalized linear models and quantile regression models for pinus pinea pine nuts and kernels characteristics*. IX Workshop on Computational Data Analysis and Numerical Methods, 5 a 7 de setembro, Évora. https://www.wcdanm2024.uevora.pt/. *Book of abstracts of the IX Workshop on Computational Data Analysis and Numerical Methods*, 104-105. ISBN: 978-972-778-417-2.

B70. **Afonso, A.**, **Jacinto, G.**, Amaro, P., Fonseca, C., Pereira, A., Pinho, L. G. (2024). Associated factors with mental health of Portuguese university health students. XXXI Jornadas de Classificação e Análise de Dados, 18 a 20 de abril, Leiria. *Programme and Book of Abstracts. XXXI Meeting of the Portuguese Association for Classification and Data Analysis (JOCLAD 2024), CLAD*, 157-158. ISBN 978-989-35097-1-5. https://drive.google.com/file/d/14OJYHgrWLOW1uAixtSNo3kE-NGci5KVK/view?usp=sharing

B71. **Braumann, C. A.** (presenter); **Filipe, P. A.**; **Jacinto, G.**; **Jamba, N. T.** Testing sources of variability in a hierarchical class of stochastic individual growth models. Encontro Anual do CIMA 2024 - CIMA Annual Meeting 2024, February 2-3, 2024, Funchal, http://ccm.uma.pt/cima2024/ Abstract in: *Book of Abstracts - CIMA Annual Meeting 2024*, p. 7-8, http://ccm.uma.pt/cima2024/downloads-2/files/Livro_Resumos_E_CIMA_2024-final.pdf

B72. **Carlos, C.** (presenter); **Braumann, C. A.**; Brites, N. M. Comparison of extinction times for stochastic logistic type models. Encontro Anual do CIMA 2024 - CIMA Annual Meeting 2024, February 2-3, 2024, Funchal, http://ccm.uma.pt/cima2024/ Abstract in: *Book of Abstracts - CIMA Annual Meeting 2024*, p. 11, http://ccm.uma.pt/cima2024/downloads-2/files/Livro_Resumos_E_CIMA_2024-final.pdf

B73. **Dulce Gomes**. Structural Breaks and Segmented Regression Analysis in Time Series. Annual Meeting 2024, 2-3 February 2024, Universidade da Madeira, Funchal (presencial). http://ccm.uma.pt/cima2024/ Book of abstracts. CIMA - Centro de Investigação em Matemática e

Aplicações. Annual Meeting 2024, p.15. http://ccm.uma.pt/cima2024/downloads-2/files/Livro_Resumos_E_CIMA_2024-final.pdf

B74. **Lígia Henriques-Rodrigues**, A new class of location invariant Value-at-Risk estimators, in CIMA Annual Meeting 2024, 2-3 February, Funchal, Madeira. http://ccm.uma.pt/cima2024/ Abstract in: *Book of Abstracts - CIMA Annual Meeting 2024*, p. 19, http://ccm.uma.pt/cima2024/downloads-2/files/Livro_Resumos_E_CIMA_2024-final.pdf

B75. Carinhas, D., Rocha, J., **Infante, P.** (2024). Stability and homogeneity analysis of a thermoregulated bath. XXXI Jornadas de Classificação e Análise de Dados, 18 a 20 de abril, Leiria. *Programme and Book of Abstracts. XXXI Meeting of the Portuguese Association for Classification and Data Analysis (JOCLAD 2024), CLAD*, 157-158. ISBN 978-989-35097-1-5. https://drive.google.com/file/d/14OJYHgrWLOW1uAixtSNo3kE-NGci5KVK/view?usp=sharing

B76. Ascenso, L., Quintino, H., **Infante, P.** (2024). Untangling the chaos: modelling emergency department flow. XXXI Jornadas de Classificação e Análise de Dados, 18 a 20 de abril, Leiria. *Programme and Book of Abstracts. XXXI Meeting of the Portuguese Association for Classification and Data Analysis (JOCLAD 2024), CLAD*, 157-158. ISBN 978-989-35097-1-5. https://drive.google.com/file/d/14OJYHgrWLOW1uAixtSNo3kE-NGci5KVK/view?usp=sharing

B77. Furtado, K., **Infante, P.**, Cartaxo, F., Banha, L., Rodrigues, D., Pires, D. (2024). Patient centered and task centered care: impact on npatients with pressure ulcers in long term care, 23 and 24 september. Évora, Book of Abstracts, 5th CHRC Annual summit, 26, Port J Public Health 2024;42(suppl 2):1–32, DOI:10.1159/000542309. (http://karger.com/pjp/article-pdf/42/Suppl.2/1/4316314/000542309.pdf)

B78. Elsa Batista, **João Alves e Sousa**, Diogo Fortes (2024). Desenvolvimento de métodos para determinação de caudal e volume em sistemas microfluídicos, *9.º Encontro Nacional da SPMet*, 25 de outubro de 2024, ISEL, Porto.

B79. **Jorge Santos, Marília Pires, Russell Alpizar Jara**, DEMYSTIFYING SOME RULES OF THUMB IN STATISTICS, in CIMA Annual Meeting 2024, 2-3 February, Funchal, Madeira. http://ccm.uma.pt/cima2024/ Abstract in: *Book of Abstracts - CIMA Annual Meeting 2024*, p. 25, http://ccm.uma.pt/cima2024/downloads-2/files/Livro_Resumos_E_CIMA_2024-final.pdf

B80. **José Alberto Rodrigues** Numerical Studies on the Effect of Shear Stress During the Metastasis Process, CIMA Annual Meeting, February 2-3, 2024. http://ccm.uma.pt/cima2024/downloads-2/files/Livro_Resumos_CIMA__Final.pdf

B81. **Ana Rodrigues**, Dinamica com simetria. Encontro Nacional da Sociedade Portuguesa de Matematica. University of Minho. Braga, Portugal, 12 July 2024.

B82. **C. Correia Ramos**, Behavior in a dynamical model, DSABNS, NOVA FCT Caparica, Portugal, february 6 - 9, 2024. (2024)

B83. **José Alberto Rodrigues** Solving Steady-State Heat Conduction in Irregular Domains Using Physics-Informed Neural Networks and Fictitious Domain Method, IX Workshop on Computational Data Analysis and Numerical Methods (WCDANM), September 5-7, 2024, University of Évora, Portugal. https://www.wcdanm2024.uevora.pt/wp-content/uploads/2024/10/BoA_WCDANM_2024.pdf

B84. **C. Correia Ramos**, Evolutionary dynamics for cellular automata and applications,

Encontro CIMA, 2,3 fevereiro 2024, Universidade da Madeira. (2024)

B85. **José Alberto Rodrigues** Numerical Studies on the Effect of Shear Stress During the Metastasis Process, CIMA Annual Meeting, February 2-3, 2024. http://ccm.uma.pt/cima2024/downloads-2/files/Livro_Resumos_CIMA__Final.pdf

B86. Pereira G., Reis G., Reis C., Conde L., **Baptista D**. and **Baptista A**., *Verificação Formal de Redes Neuronais Profundas em Contexto de Controlo de UAVs,* Workshop em Aplicações da Matemática – WapMath, Nov 26, Leiria, Portugal, https://wapmath.ipleiria.pt/ , https://wapmath.ipleiria.pt/files/2024/11/08_Guilherme_Pereira.pdf

B87. Feliz Minhós, "***Periodic coupled systems and Van der Pol oscillators***" CIMA Annual Meeting, 02 -03 February, University of Madeira.

B88. Feliz Minhós, "I***mpulsive coupled systems involving regular and singular Phi-Laplacians***" no Scientific Meeting of Mathematics and Applications (SMMA24), University of Beira Interior, 26/09/2024, Covilhã.

B89. Marília Pires, Stabilization of Fluid Flow Oldroyd-B Simulations based on Eigenvalues of Conformation Tensor, CIMA Annual Meeting 2024, Universidade da Madeira, Portugal. February 1 – 2, 2024

B90. F. Pereira, Directional curvatures for implicitly defined subsets of R^n,CIMA Annual Meeting 2024, February 2-3, 2024, Funchal (Madeira, Portugal). http://ccm.uma.pt/cima2024/ chrome extension://efaidnbmnnnibpcajpcglclefindmkaj/http://ccm.uma.pt/cima2024/downloads-2/files/Livro_Resumos_CIMA__Final.pdf

B91. M. Grinfeld, Travelling waves in the Rosenau-KdV equation, CIMA Annual Meeting 2024, February 2–3, 2024, University of Madeira, Funchal, Portugal

B92. M. Grinfeld, Solvability and the Minimality Exchange, ENSPM2024, Infinite-dimensional dynamics: theory and applications, m mini-symposium in memory of rafael S. Sasportes, University of Minho, July 10-12, 2024, Braga, Portugal.

B93. J. Correia, 2x2 Nonlinear hyperbolic systems of conservation laws, CIMA Annual Meeting 2024, February 2–3, 2024, University of Madeira, Funchal, Portugal

Invited communications at national events

B94. Bruno Dinis, Bruno Jacinto - Vagueness and transitivity - Days in Logic 2024, 1-3 February 2024- Instituto Superior Técnico (https://www.math.tecnico.ulisboa.pt/~css/daysinlogic2024/home)

B95. **Ana Rodrigues**, Dinamica com simetria. Encontro Nacional da Sociedade Portuguesa de Matematica. University of Minho. Braga, Portugal, 12 July 2024.

B96. **Ana Rodrigues**, A dynamical journey around double standard maps. Spring School in Dynamical Systems, University of Lisbon. Lisbon, Portugal, 28 May 2024.

B97. **Ana Rodrigues**, A journey into Sn -symmetry. Workshop em Dinamica e Simetria. Homenagem ao 70 aniversario da Professora Isabel Labouriau. University of Porto. Porto, Portugal, 8 May 2024.

C – Reports

C1 Sousa-Ferreira, I., Rocha, C. e **Abreu, A. M.** (2024). Flexible parametric models with shared inverse Gaussian frailty for gap times between recurrent events. Technical Report, Notas e Comunicações CEAUL 02/24, Lisboa, Portugal. ISBN: 978-989-733-066-7

C2 **Infante, P.** (2024). Avaliação do Projeto AdolesSer nos anos letivos 2022/23 e 2023/24. Universidade de Évora e ACES.

C3 Veiga, P., Rangel, M., **Jacinto, G.**, Ünal, V. (2024). Fisheries Socioeconomic: Recreational Fishing, Local Ecological Knowledge, Fishing Fleet and Alternative Livelihoods. WP 3 Recreation Fishing Report. King Abdullah University of Science and Technology – Beacon Development (KBD).

C4 Veiga, P., **Jacinto, G.,** Rangel, M. (2024).Best assessment and management practices (2024). NEOM, recreational fishing data collection, King Abdullah University of Science and Technology – Beacon Development (KBD). Revisor: Ünal V., Dimech, M. Criquet Martinez, G.

C5 Veiga, P., **Jacinto, G.,** Rangel, M. (2024). Field Guide. NEOM, recreational fishing data collection, King Abdullah University of Science and Technology – Beacon Development (KBD). Revisor: Ünal V., Dimech, M. Criquet Martinez, G.

C6 Veiga, P., **Jacinto, G.,** Rangel, M. (2024). Survey Plan. NEOM, recreational fishing data collection, King Abdullah University of Science and Technology – Beacon Development (KBD). Revisor: Ünal V., Dimech, M. Criquet Martinez, G.

C7 **Afonso, A.**, **Jacinto, G.**(2024). Mental Health of University Students in Europe. MHUS project, EU GREEN Alliance. 62 pp.

C8 **Afonso, A.**, **Jacinto, G.** (2024). Saúde mental dos estudantes do ensino superior de Portugal no ano letivo de 2023/2024. MHUS project, EU GREEN Alliance. 16 pp.

C9 **Afonso, A.**, **Jacinto, G.** (2024). Saúde mental dos estudantes do ensino superior da Suécia. Research Project of Mental Health of University Students. 28 pp.

C10 **Afonso, A.**, **Jacinto, G.** (2024). Saúde mental dos estudantes do ensino superior da Alemanha. Research Project of Mental Health of University Students. 29 pp.

C11 **Afonso, A.**, **Jacinto, G.** (2024). Saúde mental dos estudantes do ensino superior de Portugal no ano letivo de 2022/2023. Research Project of Mental Health of University Students. 34 pp.

C12 **Afonso, A.**, **Jacinto, G.** (2024). Saúde mental dos estudantes do ensino superior do Brasil. Research Project of Mental Health of University Students. 28 pp.

C13 **Afonso, A.**, **Jacinto, G.** (2024). Saúde mental dos estudantes do ensino superior da Turquia. Research Project of Mental Health of University Students. 25p p.

C14 **Afonso, A.**, **Jacinto, G.** (2024). Saúde mental dos estudantes do ensino superior do Equador. Research Project of Mental Health of University Students. 18 pp

C15 Muhammad Ahsan, Leander van der Bijl, Fabio Buccoliero, Yanfei Chen, Joaquim Correia, Leila Hashemi, Francesca Leonardi, Gabriel Lord, Juan Machado, Zhirui Tang, Leoni Winschermann, Jialing Yu; “Modelling the heat transition". Mathematics in Industry Reports (MIIR), 2024, ECMI DOI 10.33774/miir-2024-1ksvm

D – Organization of conferences and seminars

International Meetings

D1. **Carlos A. Braumann**. 15th International Conference on Dynamical Systems Applied to Biology and Natural Sciences (DSABNS 2024), FCT-UNL, Caparica, Portugal, February 6-9, 2024, https://sites.google.com/view/dsabns2024, Member of the Scientific Committee: https://sites.google.com/view/dsabns2024/organizing-committee, Reviewer of Abstracts

D2. **Carlos A. Braumann**. Models in Population Dynamics, Ecology, and Evolution (MPDEE’24). Leicester, UK, April 15-19, 2024, https://web.mat.bham.ac.uk/N.B.Petrovskaya/MPDEE24.htm Member of the International Scientific Advisory Committee: same webpage.

D3. **Carlos A. Braumann**. ICMASC’2024 - International Conference on Mathematical Analysis and Applications in Science and Engineering, hybrid conference, Porto, Portugal, June 20-22, 2024, https://www2.isep.ipp.pt/icmasc/ Member of the Honorary Committee: https://www2.isep.ipp.pt/icmasc/?page_id=2

D4. **Carlos A. Braumann.** 1st International Congress of Applied Mathematics and Artificial Intelligence (ICAMAI’24), hybrid conference, Faculty of Sciences Dhar El Mahraz, University Sidi Mohamed Ben Abdellah, Fez, Morocco, July 1-3, 2024, https://icamai24.sciencesconf.org/?lang=en/ Member of the Scientific Committee: https://icamai24.sciencesconf.org/resource/page/id/4

D5. **Carlos A. Braumann.** 2nd International Workshop on Mathematics and Physical Sciences (MatPhys24), Satellite Conference of the 9th European Congress of Mathematics of the European Mathematical Society, July 11-12, 2024, University of Évora, Portugal, https://www.2iwmps24.uevora.pt/ Member of the Scientific Committee: https://www.2iwmps24.uevora.pt/committee/

D6. **Carlos A. Braumann**. WCDANM | 2024 - IX Workshop on Computational Data Analysis and Numerical Methods, hybrid conference, September 5-7, 2024, https://www.wcdanm2024.uevora.pt Member of the Scientific Committee: https://www.wcdanm2024.uevora.pt

D7. **Carlos A. Braumann**. 16th International Conference on Dynamical Systems Applied to Biology and Natural Sciences (DSABNS 2025), Naples, Italy, January 20-24, 2025, https://sites.google.com/view/dsabns2025/ Member of the International Organizing Committee: https://sites.google.com/view/dsabns2024/organizing-committee

D8. **Carlos A. Braumann**. Models in Population Dynamics, Ecology, and Evolution (MPDEE'25). Bilbao, Spain, May 5-9, 2025, https://www.bcamath.org/events/mpdee25/en/ Member of the Scientific Committee: same webpage.

D9. **Dulce Gomes**. IX Workshop on Computational Data Analysis and Numerical Methods (WCDANM), University of Évora (Portugal), September 05th to 07th, 2024. https://www.wcdanm2024.uevora.pt/ Member of the Organizing Committee: https://www.wcdanm2024.uevora.pt/commitees/

D10. **Manuel do Carmo**. ICMCT&A´24-International Conference on Marketing, Communication, Technologies and Applications, Bogotá, Colombia, November 14-14 2024, Member of the Scientific Committee: https://www.icmcta.org/index.php/en/committees.

D11. **Manuel do Carmo**. ICMarkTech´24-The 2024 International Conference on Marketing and Technologies, Azores, Portugal, December 05-07 2024, Member of the Scientific Committee: http://www.icmarktech.org/commitees.

D12. **Manuel do Carmo**. IX Jornadas de Engenharia da Academia Militar, Amadora, Portugal, December 11 2024, Member of the Scientific Committee: https://academiamilitar.pt/viii-jornadas-das-engenharias.html

D13. **Lígia Henriques-Rodrigues**. Member of the Organizing Committee for the 3rd International Day of Women in Statistics and Data Science (IDWSD), October 8, 2024. https://www.idwsds.org/committees/

D14. **Lígia Henriques-Rodrigues**. Member of the Organizing Committee for the Joint Session of the Portuguese Statistical Society and the Portuguese Section of the CWS at the 2nd IDWSD,

October 8, 2024, " Next Generation: Showcasing Young Portuguese Talent in Statistics and Data Science ." https://www.idwsds.org/wp-content/uploads/2024/10/2024-Program-Book.pdf

D15. **Dulce G. Pereira.** The 53rd International Biometrical Colloquium, Szamotuly (Poland), September 08-11, 2024, URL: https://kzmi.up.lublin.pl/ibc53/. Member of the Scientific Committee

D16. **Luis Silva,** 24th European Conference on Iteration Theory (ECIT 2024), Vimeiro, Portugal, 27-31 May 2024, ECIT 2024 Member of the Organizing committee.

D17. Feliz Minhós, Chair do Scientific Committee of the 2nd International Workshop on Mathematics and Physical Sciences, Universidade de Évora, July, 12-13, 2024, https://www.2iwmps24.uevora.pt/committee/

D18. Feliz Minhós, Member of the Steering Committee of The 16th International Conference on Pure Mathematics, Applied Mathematics and Computational Methods, Bern, Switzerland, June 27-30, 2024. https://www.inase.org/conferences/2024/june2/pmamcm.htm#tpc

D19. Feliz Minhós, Member of the Program Committee of The 16th International Conference on Pure Mathematics, Computational Methods, Applied Mathematics Rome, Italy, June 20-22, 2024, https://www.inase.org/conferences/2024/june+/pmcmam.htm#tpc

D20. Feliz Minhós, Member of the Steering Committee of The 16th International Conference on Pure Mathematics, Applied Mathematics and Computational Methods, Ierapetra Beach, Crete Island, Greece, May 7-9, 2024, https://www.inase.org/conferences/2024/may/pmamcm.htm#tpc

D21. Feliz Minhós, Member of the Steering Committee of The 16th International Conference on Mathematical Models and Methods in Applied Sciences, London, UK, April 29-May1 2024 , https://www.inase.org/conferences/2024/april/mmmas.htm#tpc

D22. Feliz Minhós, Member of the Program Committee of The 16th International Conference on Physics and Mathematics, Rome, Italy, March 23-25. 2024, https://www.inase.org/conferences/2024/march/pm.htm#tpc

D23. Feliz Minhós, Member of the Steering Committee of The 16th International Conference on Mathematical Methods, Mathematical Models and Simulation in Science and Engineering, Puerto de la Cruz, Tenerife, Canary Island, Spain, January 27-29, 2024 https://www.inase.org/conferences/2024/january/mmsse.htm#tpc

D24. Zappale, E., 2024 Co-organizer of a session at the conference SIAM Materials, Pittsburgh, PA, USA.

D25. Zappale, E., 2024 Co-organizer of a session at the 'International Conference on Elliptic and Parabolic Problems: GAETA 2024'.

D26. Zappale, E., 2024 Co-organizer of a session at the ' ECM conference in Sevilla-Spain.

D27. Zappale, E., 2024 Co-organizer of a session at the joint UMI-AMS meeting, Palermo, Italy.

D28. Zappale, E., Co-Organizer of the international workshop'Calculus of Variations and Nonlinear Analysis in the Applied Sciences' presso il Dipartimento SBAI di Sapienza – Universit ´a di Roma. https://sites.google.com/uniroma1.it/calvar-nonlin-an-appl-sci/home, June 2024.

D29. Zappale, E., Co-organizer of the 2nd International Workshop on Mathematics and Physical Sciences (MatPhys) https://www.2iwmps24.uevora.pt/, July 2024.

D30. Zappale, E., Organizers of the seminar on Structured Deformations by Ana Cristina Barroso at Sapienza -University of Rome, October 24.

D31. Zappale, E., Organizer of the seminar on Two-Scale convergence by Joel Fotso Tachago at Sapienza-University of Rome, May 2024.

D32. F. Carapau, P. Correia, 2nd International Workshop on Mathematics and Physical Sciences, CIMA-UÉ, Universidade de Évora, 11-12 july 2024, Member of the organizer committee, (https://www.2iwmps24.uevora.pt/

D33. Marília Pires: Mathematics with Applications 2025, Funchal – Madeira on the occasion of the 60th Birthday of Professor Šárka Nečasová, June 2-6, 2025, https://mathapp2025.com/- Member of Organizing committee

D34. J. Correia, WOTCA 2024 Workshop on Operator Theory, Complex Analysis, and Applications 2024 (Organiser), University of Madeira, July 22–26, 2024, Funchal, Portugal

D35. J. Correia, CIMPA 2024 School Mathematics for Medicine and Health Sciences (Organiser & Scientific Committee), Silpakorn University, May 13–24, 2024, Nakhon Pathom, Thailand

D36. J. Correia, AESIM 2023 school Mathematics for Health Sciences (Organiser & Scientific Committee), BITS-Pilani, December 28, 2023—January 6, 2024, Pilani, India

National Meetings

D37. **da Silva, J.L., Bock, W. & Krüger, T.,** Madeira Epidemic Modellers Encounter 2024, Universidade da Madeira, Funchal, August 19-23, 2024, http://ccm.uma.pt/MEME2024/, organizer.

D38. **Luís M. Grilo**. Chairman of the Executive and Organizing Committees of the IX Workshop on Computational Data Analysis and Numerical Methods (IX WCDANM), University of Évora, Évora, September 5-7, 2024 (p. iii of the abstract book). https://www.wcdanm2024.uevora.pt/commitees/

D39. **da Silva, J.L. Reis, M. & Garapa, M**. CIMA Annual Meeting 2024, Universidade da Madeira, Funchal, February 2-3, 2024, http://ccm.uma.pt/cima2024/, organizer.

D40. **Ana Rodrigues**, Organized a parallel session (by invitation). Encontro nacional da Sociedade Portuguesa de Matematica(10/12 July 2024). Low dimensional dynamical systems. Speakers: Ana Cristina Freitas (FEUP), Pedro Duarte (FCUL), Jorge Freitas (FCUP)

D41. **A. Batista,** Workshop em Aplicações da Matemática – **WapMath**, Escola Superior de Tecnologia e Gestão de Leiria, 26 de novembro de 2024, https://wapmath.ipleiria.pt/, organizing committee member.

D42. **José Alberto Rodrigues** Journal: Mathematics, Webinar Title: Computational Modeling of Functionally Graded Materials and Structures. Date: October 22, 2024. https://sciforum.net/event/Mathematics-10

D43. Feliz Minhós, Member of the Scientific Committee do IX Workshop on Computational Data Analysis and Numerical Methods (WCDANM), **University of Évora,** September 05-07, 2024,
Évora, Portugal**,** https://www.wcdanm2024.uevora.pt/commitees/

D44. M. Grinfeld, ENSPM2024 Infinite-dimensional dynamics: theory and applications, a mini-symposium in memory of Rafael S. Sasportes (Part I) (Organiser), Infinite-dimensional dynamics: theory and applications, a mini-symposium in memory of Rafael S. Sasportes (Part II) (Organiser), University of Minho July 10–12, 2024, Braga, Portugal

D45. J. Correia, ENSPM2024 Infinite-dimensional dynamics: theory and applications, a mini-symposium in memory of Rafael S. Sasportes (Part I) (Organiser), In nite-dimensional dynamics: theory and applications, a mini-symposium in memory of Rafael S. Sasportes (Part II) (Organiser), University of Minho July 10–12, 2024, Braga, Portugal

E – Advanced training

Post-Doc Grants

E1 João Cardoso Dias, Combinatory, number theory and algebra through artificial intelligence, Supervisors: **Carlos Ramos**, co-orientadores: **Manuel Branco**, Irene Rodrigues. Universidade de Évora. (2023-2024 2025)

E2 Zaitri

E3 Antonino Ficarra

E4 Ali Raza

PhD Thesis (Concluded)

E5 Alviu Rey B. Nasir, Perturbative Exponentially Growing Potentials on Quantum Mechanical Systems, Jingle B. Magallanes & **da Silva, J.L.**

E6 Luana Sales. Impacto de comorbidades diabetes mellitus e COVID-19 na Tuberculose no estado de São Paulo. Supervisores: Ricardo A. Arcêncio and **Dulce Gomes**. PhD in Public Health Nursing (University of São Paulo at Ribeirão Preto School of Nursing, Brazil).

E7 Nelson T. Jamba (2024). Mixed Models for Individual Growth in a Random Environment. Doctoral Program in Mathematics. Évora University. Advisors: **Patrícia Filipe** and **Gonçalo Jacinto**

E8 Gracino Francisco Rodrigues, *"*Existence, non existence and multiplicity of solutions for higher order boundary value problems*", Advisers: Feliz Minhós and Fernando Carapau.* Universidade de Évora, 17/10/2024.

Master Thesis (Concluded)

E9 Rodrigo Luís Abreu Gonçalves, Propagação de Sinal em Meios Urbanos para Implementação de Sistemas LoRa. Supervisor: Joaquim Amândio Rodrigues Azevedo.

E10 Dinis Silva. Abandono de Árbitros no Futsal. Mestrado em Direção e Gestão Desportiva, Universidade de Évora. Supervisors: Mário Teixeira, Fernando Starepravo, Anabela Afonso.

E11 Gonçalo Mendes. Esports no contexto universitário de Portugal: caraterização dos gamers estudantes do ensino superior. Mestrado em Direção e Gestão Desportiva, Universidade de Évora. Supervisors: Mário Teixeira, Jerónimo García-Fernández, Anabela Afonso.

E12 Marlene Venâncio Guerreiro, Criação de Valor em Processos de Aquisições e Fusões - O Caso ZON/Optimus, Ana Isabel Guerra Cantarinha e Maria Clara Pires.

E13 Mariana Marques Carapinha. Segmentação de clientes de farmácias comunitárias com aplicação em KNIME Analytics Platform. Mestrado em Métodos Analíticos para a Gestão (*Business Analytics*). Iscte - Instituto Universitário de Lisboa. Supervisor: Patrícia A. Filipe.

E14 Ana Catarina Guerreiro Parrinha. Segmentação de clientes: um caso de aplicação em farmácia comunitária. Mestrado em Ciência de Dados. Iscte - Instituto Universitário de Lisboa. Supervisor: Patrícia A. Filipe

E15 Diana Fonseca, Masters in Applied Mathematics for Industry, Automatic Recognition of Tables in Documents, Supervisors **José A. Rodrigues** and **Luís Silva**

E16 Rafael Alexandre Dias Andorinha, "Métodos de clustering para a automatização do cálculo de KPI da qualidade de pré-classificação de veículos em ambiente de portagem"
Estágio da Licenciatura em Matemática Aplicada à Tecnologia e à Empresa, ISEL, Orientadores: **José Alberto Rodrigues**, Pedro Mendes Jorge e Ana Silva Vieira.

E17 Daniela Sofia Duarte Pedrosa, *Movimentação de Cargas Suspensas*, Carlos Neves e **Diogo Baptista**

E18 Carlos André Macedo Gonçalves, *Verificação formal de redes neuronais profundas em contexto de condução autónoma,* Luís Bento, **Diogo Baptista e Alexandra Baptista**

E19 Cristian Robu, "The Use of Artificial Intelligence in the Recognition of Railway Assets Based on High-Resolution Drone Images", **Filipe Cal** and Carlos Brás Geraldes, MMAI - ISEL

E20 Inês Henriques, "Railway Signal Monitoring", **Filipe Cal** and Nuno Lopes, MMAI - ISEL

PhD Thesis (ongoing)

E21 Sónia Barbosa. Monotorização escolar no ensino básico. Programa de Doutoramento em Matemática (e-learning), Universidade de Évora. Supervisors: **Paulo Infante, Anabela Afons**o.

E22 Hugo Salgueiro, H. D. A. G. Funcionalidade, Saúde e Qualidade de Vida na População Mais Velha com Multimorbilidade da Região do Alentejo Central, Doutoramento em Ciências da Saúde e Bem Estar, Universidade de Évora e Universidade Nova de Lisboa. Supervisors: Manuel Lopes, Anabela Afonso.

E23 Ana Pedro Costa. Determinantes da Depressão e Ansiedade na Qualidade de Vida e Funcionalidade da População Adulta Portuguesa. Doutoramento em Ciências da Saúde e Bem Estar, Universidade de Évora e Universidade Nova de Lisboa. Supervisors: Manuel Lopes, Anabela Afonso.

E24 Manuel Ana Alberto. Uma aplicação à sinistralidade rodoviária em Angola 2002-2015. PhD in Mathematics (University of Évora). Supervisores: **Dulce Gomes** and **Patrícia A. Filipe**

E25 Jaime Agostinho Jerónimo. Análise de sobrevivência de mulheres diagnosticadas com cancro de mama em Angola no período de 2013 a 2017 PhD in Mathematics (University of Évora). Supervisores: **Patrícia A. Filipe** and **Dulce Gomes**.

E26 Sérgio Castigo. Aglomerados temporais em Epidemiologia: Estudos comparativos e aplicação ao número de casos e de mortes por COVID-19 em Moçambique. PhD in Mathematics (University of Évora). Supervisores: **Dulce Gomes** and Cristiana J. Silva

E27 Maria Teresa Ferreira, "*A Influência das Crises Económicas e Pandémicas no Turismo Português: uma perspetiva econométrica*", PhD in Tourism (University of Algarve). Supervisores: **Manuel do Carmo** and Sandra G. Custódio

E28 Nadia Bachir, Statistical and machine learning for complex spatio-temporal fire data, Department of Mathematics at the School of Sciences and Technology of the New University of Lisbon, FCT Scholarship 2023.04213.BD, 2023. Advisors: Regina Bispo and **Lígia Henriques-Rodrigues**

E29 António Loría Garcia, Advanced imputation techniques in rotating panel designs surveys, Department of Mathematics at the School of Sciences and Technology of the University of Évora. Scholarship. CIMA/BD1/2023, Projeto UIDP/04674/2020, 2024. Advisors: Pedro Campos and **Lígia Henriques-Rodrigues**

E30 Dora Carinhas, Modelação Estatística das Marés. Doutoramento em Matemática, Universidade de Évora. Supervisors: **Paulo Infante**, António Martinho.

E31 Samira Velaquez. Marine recreational fishing in Portugal: Estimating ecological, biological and economic impacts and unnacounted fishing mortality. Doctoral Program in Marine Biology, Algarve University. Advisors: Mafalda Rangel, Pedro Guerreiro and **Gonçalo Jacinto**.

E32 Luís António Galego Pinto, Marketing Mix Modelling and Influence Maximization in Complex Networks Programa de Doutoramento em Matemática, Universidade de Évora. Supervisors:**Jorge Santos**, Carlos Ramos, Orlando Gomes

E33 Samuel Garicai Arone's PhD Thesis in “Applied Mathematics and Modeling”. Thesis title: Modeling the monetary circulation series in Mozambique. Mathematics Section, Department of Science and Technology, Open University, Lisboa, Portugal (submitted in 2024 and awaiting discussion). **Luís M. Grilo**.

E34 Noah Cockram (University of Exeter), Supervisors: **Ana Rodrigues**, P. Ashwin.

E35 Nada El Bouziani, Simulation of material blocks using automated methods, Doutoramento em engenharia mecatrónica, Supervisors: **Carlos Ramos**, Mohaydine Tlemçani.

E36 Cristina Pimentel. NUMERICAL APPROXIMATION FOR SOME VECTOR, VARIATIONAL PROBLEMS, Supervisors: **Vladimir Bushenkov and Luis Bandeira**

E37 Nuno Miguel Granja de Oliveira , "Higher order boundary value problems with parameters" *Advisor: Feliz Minhós*

E38 Sara Isabel Aleixo Perestrelo, "Periodic coupled systems and synchronization", *Advisers: Feliz Minhós and* Henrique Oliveira (Instituto Superior Técnico, University of Lisbon

E39 Jorge Alberto Camisola (D47931), Simulação Numérica de Escoamento de Esgotos na Cidade de Tete, 1 Ano, Supervisor: Marília Pires

E40 B. Doungsavanh (Laos PDR; Ph.D. co-advising with Y. Mammeri), Mathematical Analysis of Structured Models of Waterborne Diseases: Application to Laos, J. Correia

E41 K. Vongsavang (Laos PDR; Ph.D. co-advising with F.P. da Costa), Diffusive-Dispersive Conservation Laws in Coagulation-Fragmentation, J. Correia

E42 G. Maypaokha (Laos PDR; Ph.D. co-advising with N. Bedjaoui), Effect of the Saturating Diffusion on Hyperbolic Equations, J. Correia

E43 Mário Eduino Pina dos Santos Lopes, "Nonconvex differential inclusions", student of the PhD Program in Mathematics, University of Évora. Adviser: Clara Carlota, University of Évora. Co-adviser: António Ornelas, University of Évora.

Master Thesis (ongoing)

E44 Paulo N'Bundé's Master's thesis in "Statistical Modeling and Data Analysis". Thesis title: Statistical Contributions to the Assessment of Psychosocial Risks in Guinean Immigrant Workers in Portugal. Department of Mathematics, School of Science and Technology, University of Évora, since november, 2023. **Luís M. Grilo**

E45 Student: Vânia Domingas de Sousa Figueira, Title: Métodos geradores de distribuições de probabilidade, Supervisor: **Ana Maria Abreu**

E46 João Francisco Correia Freitas, Medição da qualidade do ar no Funchal com rede LoRa. Supervisor: Joaquim Amândio Rodrigues Azevedo.

E47 Luis Ferreira. Impacte das pressões antrópicas e das condições bioclimáticas sobre populações de zimbrais dunares (2250*): modelos de distribuição de espécies. Mestrado em Modelação Estatística e Análise de Dados, Universidade de Évora. Supervisors: Anabela Afonso, Catarina Meireles, Diogo Alagador.

E48 Ana Sapata. Uso de modelos de regressão e de machine learning para modelação dos resultados de jogos de futebol. Mestrado em Modelação Estatística e Análise de Dados, Universidade de Évora. Supervisors: Anabela Afonso, José Saias.

E49 Lassana Mendes. Estimação da prevalência de doenças com o método de captura-recaptura. Mestrado em Modelação Estatística e Análise de Dados, Universidade de Évora. Supervisor: Anabela Afonso.

E50 Patrícia Anjo, Supervisor: Ana Cantarinha, Sandra Bailoa

E51 Félix Sinhá, A relação entre a dívida pública e crescimento económico na Guiné Bissau, 2004-2023, Supervisor: Ana Cantarinha, Sandra Bailoa

E52 Carla Rosa, Fatores que influenciam a balança comercial portuguesa,Supervisor: Ana Cantarinha, Paulo Ferreira

E53 Maria Rodrigues, A performance das empresas na Euronext Lisbon, A preocupação com a sustentabilidade é importante?, Supervisor: Ana Cantarinha, Clara Pires

E54 Fligêncio Hermogenes Gomes. *Análise e previsão do número de casos e de mortes por COVID-19 na Guiné-Bissau: Estudo comparativo entre modelos ARIMA e modelos de redes neuronais (LSTM)*. Master in Statistical Modeling and Data Analysis (University of Évora). Supervisor: **Dulce Gomes**

E55 Teotónio Gaspar Feliciano. *Modelação e previsão das taxas de mortalidade infantil nos países da CPLP entre 1985 e 2020 usando modelos de Séries Temporais*. Master in Statistical Modeling and Data Analysis (University of Évora). Supervisor: **Dulce Gomes**

E56 Samira Cardoso Chicha. *Análise e previsão da produção de eletricidade a partir de energias renováveis em Cabo Verde*. Master in Statistical Modeling and Data Analysis (University of Évora). Supervisor: **Dulce Gomes**

E57 Ludomilo Almeida. *Detecção de Mudanças de Estrutura em Séries Temporais.* Master in Statistical Modeling and Data Analysis (University of Évora). Supervisors: **Dulce Gomes** and **Lígia Henriques-Rodrigues**

E58 Maria Beatriz Meireles Martins*. A razão do sucesso escolar finlandês: um estudo de meta-análise baseado em avaliações internacionais de desempenho dos alunos, a*

matemática. Master in Statistical Modeling and Data Analysis (University of Évora). Supervisors: **Dulce Gomes** and Paulo Costa

E59 Laura Magnani Machado*. Demographic behavior of social insect populations: the specific case of Formicidae*. Master in *Statistical Modeling* and Data Analysis (University of Évora). Supervisors: Filipe Ribeiro and **Dulce Gomes**

E60 Gonçalo Nascimento de Castro*. O Turismo Militar como motor da projeção da imagem do Exército português e da preservação do património*. Master in Military Sciences (Military Academy). Supervisor: **Manuel do Carmo**

E61 João Cortesão Almeida*. As Cartas de Controlo da Qualidade como ferramenta de eficiência do Tiro na Artilharia*. Master in Military Sciences (Military Academy). Supervisor: **Manuel do Carmo**

E62 Ana Rita Vaz Ambrósio, Statistical Modeling of Maximum Temperatures in the Alentejo Region, Master's in Statistical Modeling and Data Analysis, University of Évora, 2023. Advisor: **Lígia Henriques-Rodrigues**

E63 Edelise Brito Rodrigues Moreno, An Application of Extreme Value Theory in Modeling Air Quality during the Extreme Fires Season in Portugal, Master's in Statistical Modeling and Data Analysis, University of Évora,2023. Advisors: **Lígia Henriques-Rodrigues** and Ediclê de Souza Fernandes Duarte

E64 Maria Margarida Coelho de Oliveira, Joint modelling of fire counts and sizes using spatial marked point processes, Master's in Mathematics and Applications, School of Sciences and Technology of the New University of Lisbon,2024. Advisors: Regina Bispo and **Lígia Henriques-Rodrigues**

E65 Marta Pereira, A statistical-demographic contribution to understanding the new centenarians, Master's in Statistical Modeling and Data Analysis, University of Évora, 2024. Advisors: Filipe Ribeiro and **Lígia Henriques-Rodrigues**

E66 Elsa Rosmaninho, Caraterização e Modelação Estatística da Prática de Atividade Física e Desportiva no Concelho de Évora, Mestrado em Modelação Estatística e Análise de Dados, Supervisor: **Paulo Infante**, Andreia Dionísio.

E67 Helena Leitão, Avaliação e Modelação Estatística do Impacto da Mobilidade Elétrica no Perfil de Carga do Sistema Electroprodutor Português: Análise Atual e Projeções do Consumo, Mestrado em Modelação Estatística e Análise de Dados, Supervisor: **Paulo Infante**, Pedro Horta.

E68 Lorena Santos, Modelação e Predição de Eventos Raros – um estudo comparativo, Mestrado em Modelação Estatística e Análise de Dados, Supervisor - **Paulo infante, Gonçalo Jacinto, Anabela Afonso**

E69 Belna Bequinsa. Modelos Matemáticos de Crescimento Populacional. Mestrado em Modelação Estatística e Análise de Dados. Advisor: **Gonçalo Jacinto**

E70 Jinglu Wang. O Papel da Inteligência Artificial na Melhoria dos Processos de Recrutamento na Gestão de Recursos Humanos. Mestrado em Gestão de Empresas. Iscte - Instituto Universitário de Lisboa. Supervisors: **Patrícia A. Filipe**, Maria Gabriela Silva

E71 Lara Sofia Nunes Rocha. Análise de Padrões de Procura para Produção de Kits de Picking. Mestrado em Métodos Analíticos para a Gestão (Business Analytics). Iscte - Instituto Universitário de Lisboa. Supervisor: **Patrícia A. Filipe**

E72 Tiago Vila Nova. Análise do tipo de dormidas de uma cadeia hoteleira. Mestrado em Métodos Analíticos para a Gestão (Business Analytics). Iscte - Instituto Universitário de Lisboa. Supervisor: **Patrícia A. Filipe**

E73 Joana Oliveira Duarte. Caracterização da mobilidade na cidade de Lisboa, com base em dados de comunicações móveis. Mestrado em Métodos Analíticos para a Gestão (Business Analytics). Iscte - Instituto Universitário de Lisboa. Supervisors: **Patrícia A. Filipe**, Cristiana João Silva.

E74 João Domingos Serra Lopes, "Mathematical Modeling of Metabolic Profiles in Lung and Ovarian Cancer for Biomarker Discovery and Therapeutic Response Prediction", Supervisor: **José Alberto Rodrigues**

E75 Beatriz Susana Vieira, "Simulating Stresses And Strains In Solid Mechanics Directly From Images Using Convolutional Neural Networks", Supervisor: **José Alberto Rodrigues**

E76 João Vasconcelos, Blockchain: conceitos, técnicas e aplicações, Mestrado em engenharia informática, Supervisor: **Carlos Ramos**, Universidade de Évora.

E77 Luís Romão, Autómatos celulares-estudo de tráfego urbano. Mestrado em Matemática, orientador: **Carlos Ramos**, co-orientador: **Luís Bandeira**, Universidade de Évora. (2024)

E78 André Miguel Almeida Carreira, *Comando avançado do movimento tridimensional de cargas suspensas.* Supervisors:: **Diogo Baptista** e **Alexandra Baptista**

Curricular and Scientific Internships (Ongoing)

E79 Lorena Santos. Modelação e Predição de Eventos Raros – um estudo comparativo. Bolsa de Investigação CIMA/ BI_MMEAD /2023. Advisors: **Paulo Infante, Gonçalo Jacinto, Anabela Afonso**

E80 Nadia Bachir, Statistical and machine learning for complex spatio-temporal fire data, Department of Mathematics at the School of Sciences and Technology of the New University of Lisbon, FCT Scholarship 2023.04213.BD, 2023. Advisors: Regina Bispo and Lígia Henriques-Rodrigues

E81 António Loría Garcia, Advanced imputation techniques in rotating panel designs surveys, Department of Mathematics at the School of Sciences and Technology of the University of Évora. Scholarship. CIMA/BD1/2023, Projeto UIDP/04674/2020, 2024.Advisors: Pedro Campos and Lígia Henriques-Rodrigues

E82 Rita Carrilho, Índice de Felicidade Global: Os Principais Determinantes, Bolsa de Iniciação à Investigação CIMA/BII3/2023. Advisors: **Paulo Infante**, Andreia Dionísio.

E83 Beatriz Susana Vieira Bolsa com referência CIMA/ BI_MMAI_ISEL/2023. projeto "SIMULATING STRESSES AND STRAINS IN SOLID MECHANICS DIRECTLY FROM IMAGES USING CONVOLUTIONAL NEURAL NETWORKS" Orientadores: **José Alberto Rodrigues**, Department of Mathematics of ISEL- Instituto Superior de Engenharia de Lisboa and Stéphane Bordas, Department of Computational Mechanics at University of Luxembourg an School of Engineering, Cardiff, UK

E84 Luís Romão, Modelos de tráfego urbano - autómatos celulares. CIMA/ BI_MMAT /2023, Em co orientação, **Carlos Ramos**, **Luís Bandeira**. Universidade de Évora. (2024)

E85 Inês Coelho, Sistemas regulatórios. BII1 Em co-orientação, **Carlos Ramos**, **Luís Bandeira**. Universidade de Évora. (2024)

F – Invited talks and seminars

F1 **Ana Cantarinha.** Programme Committe member of CAPSI. The conference was hosted by Porto Accounting and Business School (ISCAP), Polytechnic of Porto, Portugal, from October 3rd to 5th, 2024. https://capsi2024.apsi.pt/index.php/en/,

F2 **da Silva, J.L.** Green Measures for (Non) Markov Processes. Non-Local Generators and Singular Kernels, Department of Mathematics, Sanata Dharma University, Indonesia, July 19, 2024,

F3 Logarithm Sobolev and Poincaré Inequalities for a Class on non-Gaussian Measures: Preliminaries Results, University of Bielefeld, Germany, December 20, 2024, **Abstract**: In this talk, we derive preliminary results on the logarithm Sobolev and Poincaré inequalities for a family of random variables following a non-Gaussian distribution. This family is related to the fractional time heat equation and interpolates between double-side exponential and a sum of two delta functions. This talk is based on joint work with **da Silva, J.L.**, M. Erraoui and M. Röckner. https://stochana.math.uni-bielefeld.de/#talks.

F4 Multiplicative and additive shared frailty models for gap time data. Seminar CIMA, in Programa de Doutoramento em Matemática, da Escola de Ciências e Tecnologias da Universidade de Évora, 28 February 2024. Presenters: **Abreu, A. M.** e Sousa-Ferreira, I.

F5 **Carlos, C.** (presenter) and **Braumann, C. A.** "Modelos de crescimento populacional em ambiente aleatório" ("Population growth models in a random environment"), Seminars of the Master Program in Mathematics, Universidade de Évora, Évora, Portugal, May 22, 2024.

F6 **Dulce Gomes.** *Temporal Clustering Analysis*. Seminars of the Master Program in Mathematics, University of Évora, Évora, Portugal, October 23, 2024.

F7 **Paulo Infante**. *Inteligência Artificial e Análise de Informações Criminais*. Encerramento das Pós-Graduação em Análise de Informações: Prevenção e Investigação do Crime, Egas Moniz, 24 May, 2024.

F8 **Paulo Infante**. *Um Primeiro Retrato Pós-Intervenção*, A Pessoa com Ferida em Cuidados Continuados Integrados: Desafios e Soluções, CCDRA, Évora, 21 May, 2024.

F9 **Luís M. Grilo**. Seminar: The use of the Shirom-Melamed burnout measure in security workers: statistical comparison by years of service. Master's Degree in Safety and Hygiene at Work, School of Technology and Management, Polytechnic Institute of Beja, Portugal, November 28, 2024 (webminar). https://abrir.link/AqOiy

F10 **Luís M. Grilo**. Seminar: Simple and Multiple Linear Regression with Excel and Jamovi, Workshop on "Exploratory Data Analysis using statistical software", Polytechnic Institute of Tomar, October 12, 2024.

F11 **Luís M. Grilo**. Seminar: Statistical Inference (Comparative Population Analysis) with Excel and Jamovi, Workshop on "Exploratory Data Analysis using statistical software", Polytechnic Institute of Tomar, October 4, 2024.

F12 **Luís M. Grilo**. Seminar: Data Analysis and Processing with Excel and Jamovi, Workshop on "Exploratory Data Analysis using statistical software", Polytechnic Institute of Tomar, September 28, 2024.

F13 **Luís M. Grilo**. Short course: Structural Equation Modeling in Social, Behavioral and Health Sciences. Institute for Research and Advanced Training (IIFA), University of Évora, July 16-18, 2024. https://www.iifa.uevora.pt/informacoes/eventos/(item)/40140

F14 **Ana Rodrigues,** A dynamical journey around double standard maps, Université Aix Marseille, Institut de Mathématiques de Marseille, 4-06-2024 to 7-06-2024

F15 Zappale, E., Invited speaker at the conference : Scacco Matto al Gioco d'Azzardo, 13 december 2024, Sala consiliare del comune di Castel San Giorgio, Salerno, Italy.

F16 Zappale, E., Seminar at TUWIEN, september 2024 giving a seminar on Measure Valued Structured Deformations

F17 Zappale, E., Plenary speaker at 'Two-day Workshop on Nonlinear Analysis' , Politecnico di Torino, https://sites.google.com/view/twoday-nonlinearanalysisturin/home-page, april 2024

F18 Zappale, E., Plenary speaker al '2nd International Workshop on Mathematics and Physical Sciences (MatPhys) https://www.2iwmps24.uevora.pt/, July 2024

F19 Zappale, E., Plenary speaker at GAMM PDEs 2024, https://gammpde2024.utia.cas.cz/, Prague, September 2024

F20 Zappale, E., Invited speaker at the symposia on homogenization organized by Prof. M. E. Perez in the framework of the conference Elliptic and Parabolic PDEs, Gaeta, May 2024

F21 Marília Pires**,** Mathematical and Numerical Model for Blood Flow in Large Arteries, 2023 AESIM School - Mathematics for Health Sciences, Birla Institute of Technology & Science Pilani, Pilani, India, December 28, 2023 - January 6, 2024

F22 Marília Pires, Numerical implementation of blood flow, CIMPA School - Mathematics for Medicine and Health Sciences, Silpakorn University, Nakhon Pathom, Thailand, May 20-31, 2024

F23 Marília Pires, Finite Differences with Python (M.Sc. & Ph.D. Programme Course), IMU-CDC-VLP lectures Silpakorn University, Nakhon Pathom, Thailand, June 3 - 14, 2024

F24 Marília Pires, Finite Differences with Python (M.Sc. & Ph.D. Programme Course), Birla Institute of Technology & Science Pilani, Pilani, India, January 15 - 19, 2024

F25 [10] F. Pereira, Geometric conditions to existence and uniqueness of generalized projections in Hilbert spaces, CIDMA, Universidade de Aveiro (Aveiro, Portugal), April 5, 2024

F26 F. Pereira, Geometric conditions to existence and uniqueness of projection in Hilbert spaces Condições geométricas para a existência e a unicidade de projecção num espaço de Hilbert, Departamento de Matemática, Programa de Mestrado em Matemática, Universidade de Évora (Évora, Portugal), May, 8, 2024

G. Joint Seminars CIMA/DMAT/PDM

G1 Levi Lopes de Lima, Universidade Federal do Ceará, Brazil, From triangles to path integrals: the many facets of Gauss-Bonnet, 14/02/2024, https://youtu.be/2sWY27x0r9Y.

G2 João Dias , From Representation Theory to Super-Representation Theory , 21/2. https://youtu.be/WrTaT52NEu8

G3 Ana Maria Abreu, University of Madeira and CIMA, Multiplicative and additive shared frailty models for gap time data, 28/2/2024, https://youtu.be/BAXhtnu0Y3I

G4 João Paulo Janela, Mathematics Department and CEMAPRE, ISEG, Universidade de Lisboa, Numerical Methods for Option Pricing: Black-Scholes and Beyond, 06/03/2024, https://youtu.be/z3aO0rKcM_w

G5 Reza Mohammadpour, Uppsala University, , Restricted variational principle of Lyapunov exponents for typical cocycles, 07/03, https://youtu.be/tz3wdr1GIVo

G6 Silvia Barbeiro, Department of Mathematics, University of Coimbra,Reconstruction of the Mechanical Properties in Optical Coherence Elastography, 13/03/2024, https://youtu.be/kNyGJvCxc_M

G7 Paulo Varandas, Principal Investigator, Faculdade de Ciências da Universidade do Porto, Portugal and Associate Professor, Universidade Federal da Bahia: IME-UFBA, Brasil, On the richness of linear dynamics, 20/03/2024, https://youtu.be/tjWto48FLes

G8 Luís Bandeira, University of Évora and CIMA, Inverse conductivity problems based on vector variational principles: the 2D case, 21/03/2024, https://youtu.be/NB7CzM1o8w4

G9 Isabel Oitavem, NOVA Math and DM, FCT NOVA, Complexity and Recursion, 03/04/2024, https://youtu.be/EBIKrgGgYqE

G10 Ana Rute Domingues, Departamento de Matemática da FCUL and CMAFcIO, Shock and delta shock waves in several physical models,10/04 https://www.moodle.uevora.pt/2324/pluginfile.php/87876/mod_folder/content/0/DominguesAR-SeminarioUE-10-04-24.pdf?forcedownload=1

G11 Antonino Ficarra, PostDoc, University of Evora, Asymptotic behaviour of the v-number of homogeneous ideals, 11/04/2024, https://youtu.be/CXN9Zk_66QE

G12 Anabela Rocha, CIDMA, Universidade de Aveiro, Panel data analysis with R, 17/04/2024, https://youtu.be/MQda-MyrOcs

G13 Mikail Solis, Centro de Investigación en Matemática Pura y Aplicada, Escuela de Matemática, Universidad de Costa Rica, San José, Costa Rica, Hypothesis testing for geometric empty space survival functions, 18/04/2024, https://youtu.be/ERm0AatnS1E

G14 Clara Cordeiro, Universidade do Algarve and CEAUL, Universidade de Lisboa, Portugal, Resampling strategies for improving time series forecasts, 24/04/2024, https://youtu.be/CiKyk_06Csc

G15 Oldemar Rodriguez, Investigador principal , Centro de Investigación en Matemática Pura y Aplicada, Escuela de Matemática, Universidad de Costa Rica, San José, Costa Rica, Riemannian statistics for any type of data, 08/05/2024, https://youtu.be/R4YhzAAmC4I

G16 Anabela Silva, Universidade de Aveiro, An investigation on the existence, uniqueness and Ulam-Hyers stability of solution for a fractional differential problem, 15/05/2024, https://www.moodle.uevora.pt/2324/mod/resource/view.php?id=63269

G17 Adalberto Simões, University of Beira Interior, Department of Mathematics and Center of Mathematics and Applications of University of Beira Interior (CMA-UBI), Portugal, An Overview on Ulam Type Stabilities, 22/05/2024, https://www.moodle.uevora.pt/2324/mod/resource/view.php?id=63268

G18 Rui Albuquerque, CIMA and University of Évora, The volume of vector fields on a Riemann surface, Wednesday, 18th December 2024, 14h30, Room 093 in CLAV

G19 Alexandre Rodrigues, ISEG – REM-CEMAPRE – University of LisbonPulse vaccination in a SIR model: Global dynamics, bifurcations and seasonality, 11th December 2024, 14h30, Anf. 1 in CLAV.

G20 Ali Raza, Post-Doc CIMA, Mathematical Modeling of Infectious Diseases Dynamics, 5th of December of 2024, 14h30, room 155 in CLAV

G21 João Lopes Dias, ISEG, Dynamical systems and mathematical billiards, 27th of November 2024, 14h00, Hall 1.

G22 Miguel Abreu, IST-UL and CAMGSD, Periodic orbits in conservative dynamics, 21st November 2024, 14h30, online

G23 Carlos Ramos, CIMA and University of Évora, Evolutionary algorithms for

cellular automata and applications, 14th November 2024.

G24 Gonçalo Oliveira, IST - Universidade de Lisboa, The Maxwell problem on electrostatic points, 7th November 2024

G25 André Oliveira, investigador da FCUP / CMUP / UTAD, Higgs bundles: at the crossroads of algebra, geometry and physics, 24th October 2024.

G26 Robert de Sousa, Universidade de Cabo Verde and CIMA, Existence of Heteroclinic Solutions in Nonlinear Differential Equations of the Second-Order Incorporating Generalized Impulse Effects with the possibility of Application to Bird Population Growth, 18th October 2024

G27 João Dias, Post-doc CIMA, From fields to meadows, 10th October 2024.

H. Projects and scientific contracts

International projects

H1 Helena Soares- PID2019-104844GB-100, 2020-2025, Principal Investigator: Santiago Zarzuela Armengou, funded by Ministerio de Ciencia, Innovación y Universidades, España:

H2 RUN EU 2.0 (WP4: RUN-European Stakeholder Engagement Centre, strand RUN-Entrepreneurship programme) - European Education and Culture Executive Agency (EACEA) Grant Agreement Number: 101124674 (**A. Batista**)

H3 Project 22/08510-7 (Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP)), ``Interação e efeito da pandemia por COVID-19 no controle da tuberculose no estado de São Paulo: aspectos político-sociais, clínico-epidemiológicos e práticas inovadoras". Escola de Enfermagem de Ribeirão Preto da Universidade São Paulo (EERP-USP). PI: Ricardo Alexandre Arcêncio (No direct financing), **Dulce Gomes**

H4 Project 29/2023: 445741/2023-6 (Conselho Nacional de Desenvolvimento Científico e Tecnológico/Ministério da Ciência do Brasil, Tecnologia e Inovações (CNPq/FNDCT)), ``Implementação de tecnologias para o rastreamento e adesão ao tratamento da Tuberculose infecção ou doença entre Migrantes Internacionais, Refugiados e Apátridas no Brasil (Projeto MIRATB). EERP-USP. PI: Ricardo Alexandre Arcêncio (No direct financing) **Dulce Gomes**

H5 Project 2023/01879-8 (FAPESP), “Avaliação de custo e efetividade da estratégia de Sistema de Telecuidado de Pessoas Acometidas por Tuberculose”. EERP-USP. PI: Ione Carvalho Pinto (No direct financing) **Dulce Gomes**

H6 Project 88887.657730/2021-00 (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior/Ministério da Educação (CAPES)), “Termômetro Social COVID-19: Análise da percepção de risco, dos padrões de comportamento da população, violência e adesão às medidas de proteção consideradas no combate à pandemia no Brasil”. EERP-USP. PI: Ricardo Alexandre Arcêncio (No direct financing) **Dulce Gomes**

H7 Project 2021/08263-7 (FAPESP), “Termômetro Social COVID-19: Fatores associados à percepção de risco, aos padrões de comportamento e à adesão às medidas de proteção que influenciam no combate à pandemia no Brasil”. EERP-USP. PI: Pedro Fredemir Palha (No direct financing) **Dulce Gomes**

H8 Project 405902/2021-2 (CNPq/FNDCT),“Impacto da COVID-19 na prevenção e controle da Tuberculose no Brasil: Análise das políticas de proteção social, da situação epidemiológica e de incorporação tecnológica”. EERP-USP. PI: Ricardo Alexandre Arcêncio (No direct financing) **Dulce Gomes**

H9 **Manuel do Carmo** : Principal Investigator of the project 'The (Un)Sustainable Distribution and Application of the European Budgets for Security and Defence in the Member States', funded by the Portuguese Army. Grant number: UDebDS, Military Academy, CINAMIL, 24 Oct-27 Dec.

H10 Manuel do Carmo Director of the project 'Família Militar, Gestão de Recursos e Estratégias de Desenvolvimento: Messes Militares do Exército, Centros de Apoio Social e Residências do IASFA e Turismo Militar', funded by the Portuguese Army. Grant number: FamíliaMilitar3D, Military Academy, CINAMIL, 24 October - 27 December.

H11 MHUS – Mental Health in University Students. Member of the research team and responsible for data analysis. Funding: EU-GREEN alliance (€30,000). Duration: 12 months (2023/24). Coordinator: Lara Guedes (CHRC). **Anabela Afonso and Gonçalo Jacinto**

H12 Fundamental Principles of Sensor Network Metrology (FunSNM), EURAMET Project 22DIT02, started in 2023, 36 months, Budget 1500 k€. Fundamental principles of sensor network metrology, **João Alves e Sousa**

H13 Portuguese Quantum Communication Infrastructure, European project, started in 2023, 30 months, Budget 4M€, PTQCI, **João Alves e Sousa**

H14 Zappale, E., Participant at PRIN 2023 coordinator prof. Emilio Cirillo, two years duration.

H15 Zappale, E., Participant at the project GNAMPA 2024 'Composite materials and microstructures', coordinated by Professor Micol Amar, duration 1 year and a half Amar.

H16 Zappale, E., From april 2024 Participant at Sapienza Project 2024 coordinated by prof. M. Amar.

H17 M. Grinfeld, Mathematical Modelling and Analysis of the Tumor Coagulome, Project IEA (International Emerging Actions) 2022, CNRS, 2023-2024 (participant), coordinator E. Hingant, LAMFA (Laboratoire Amiénois de Mathématique Fondamentale et Appliquée), UMR CNRS 7352, UPJV, Amiens, France

H18 J. Correia, Projectos internacionais (Europeus, USA, etc) Mathematical Modelling and Analysis of the Tumor Coagulome, Project IEA (International Emerging Actions) 2022, CNRS, 2023-2024 (participant), coordinator E. Hingant, LAMFA (Laboratoire Amiénois de Mathématique Fondamentale et Appliquée), UMR CNRS 7352, UPJV, Amiens, France

I. Computational Software

I1. **Abreu, A. M.** e Sousa-Ferreira, I. (2024). ecpdist: Extended Chen-Poisson Lifetime Distribution. R package, version 0.2.1. DOI: 10.32614/CRAN.package.ecpdist

J. Patents

J1 Marília Pires, Método Implementado por Computador para a avaliação da Gravidade de uma Estenose Coronária em Repouso ou sob Hiperémia - **Patente Nacional nº119467**

Summary of CIMA 2024 indicators

A.1. Books	Books	**8**
	Chapters	**9**
A.2. Papers	Internationals	**76**
	Nationals	**2**
A.3. Proceedings	Internationals	**17**
	Nationals	**2**
A.4. Special Issues Edited		**1**
Total Publications		**115**
B. Comunications	Internationals	**63**
	Nationals	**34**
Total Comunications		**97**
C. Reports		**15**
D. Organization of events	Internationals	**36**
	Nationals	**9**
E. Advanced Training	PhDs	**20**
	Masters	**54**
	Post-Doc	**4**
	Others	**7**
Total Advanced Training		**85**
F. Invited Seminars		**26**
G. Joint Seminars CIMA/DMAT/PDM		**27**
H. Projects		**18**
I. Computational Software		**1**
J. Patents		**1**