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CIMA's Scientific Report

2021

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Scientific Report of CIMA 2021

I. Overview of research activities in 2021

In 2021, (last official actualization up to 31st December 2021) the team of the Research Center in Mathematics and Applications (CIMA) was composed by 67 members: 62 PhD researchers and 5 non PhD integrated researchers.

The scientific research developed in CIMA was addressed on several topics according to the different four research groups (DEO, LAG, DS, SSPA). In mid-2021, the two existing research lines (CS, MMLSIA) were reformulated into two new research lines: Mathematical Modelling in Life Sciences and Applications (MMLSA) and Mathematics and Applications to Technology and Industry (MATI).

In what follows we give a brief description of the obtained results:

1. Differential Equations and Optimization (DEO)

1.1. Boundary value problems for ordinary differential equations

- Solvability of coupled systems of Lidstone-type boundary value problems.
- Higher order functional discontinuous boundary value problems on the half-line.
- Heteroclinic and homoclinic solutions for nonlinear second-order coupled systems with ϕ -Laplacians.
- Functional coupled systems with generalized impulsive conditions with application to a SIRS model.
- Periodic third-order problems with a parameter.
- Nonlinear and Functional Higher Order Impulsive Problems.
- Existence and location of solutions to fourth-order Lidstone coupled systems with dependence on odd derivatives.

1.2. Calculus of Variations and Optimal Control

- Development of a powerful tool allowing to deal with positive parts and negative parts of $L^1(a, b)$ functions.
- Development of a powerful tool to easily determine the sign of the Lebesgue integral of a product of two measurable real functions of real variable.
- Research on existence of solutions for nonconvex problems of the calculus of variations.

1.3. Non-smooth Analysis

It was obtained an easy formula to compute the curvature in the direction of any its tangent vector and demonstrated that when the directional curvature of F is positive, there is the directional derivative of the Minkowski functional of the polar set of F .

1.4. Partial Differential Equations

- Biomathematics: Structured models of waterborne diseases; Study of the transport phenomena via the phloem and the xylem in the cork oak.
- Coagulation-Fragmentation: Analysis of Smoluchowski type models by conservation laws.
- Conservation laws: Study of saturating dissipative effects; Hyperbolic conservation laws regularisation analysis via complex singularities.

1.5. Numerical methods for partial differential equations and fluid mechanics

- Study of stabilization algorithms for numerical simulations of viscoelastic fluids flow in problems known as the High Weissenberg Number Problem.
- It was developed and test new temporal stress diffusion techniques that can avoid the unwanted artificial artifacts of the standard numerical stress stabilization.
- The numerical simulations have shown that this new temporal stress diffusion not only efficiently stabilizes numerical simulations, but also vanishes when the solution reaches a steady state. In contrast to the standard tensorial diffusion, the temporal artificial stress diffusion does not affect the final solution.
- Research in the field of fluid flow.

1.6. Multiobjective optimization

- Development of algorithms and methods for multi-objective optimization.
- Decision support systems for multi-objective forestry management in Portugal.

2. Logic, Algebra and Geometry (LAG)

2.1. Numerical semigroups

- Solve the Frobenius problem for some classes of numerical semigroups and prove the Wilf's conjecture for some other classes of numerical semigroups. W
- Study dense numerical semigroups, presenting algorithms that allow us to obtain the whole set of these semigroups
- Present algorithms that allow us to obtain the whole set of semigroups and prove Wilf's conjecture.

2.2. Logic of belief change

- Definition and axiomatic characterization of two new classes of contraction operators, namely the class of generalized partial meet contractions (GPMC) and the class of generalized kernel contractions (GKC), that can be seen as a generalization of, respectively, partial meet and kernel contractions.
- Adaption of the selective revision operators, that were proposed for belief sets, to the belief base context, obtaining a model in which the epistemic state of an agent is represented by a belief base and that allows the acceptance of only part of the new information

2.3. 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.
- Applications to Lefschetz properties and rings of coinvariants

2.4. Decomposition of anti-symmetric tensors

Introduction of the anti-symmetric apolarity lemma and construction of algorithms to decompose anti-symmetric tensors of degree at most three on a vector space of dimension at most eight.

2.5. Cohomological Blow Ups of Graded Artinian Gorenstein Algebras Along Surjective Maps ecomposition of anti-symmetric tensors.

Introduction of the cohomological blow up of a graded Artinian Gorenstein (AG) algebra along a surjective map. This is intended to translate to an algebraic context the cohomology ring of a blow up of a projective manifold along a projective submanifold

3. Dynamical Systems (DS)

3.1. Study of the use of a network of networks to create a trustful model of the spreading of forest fires.

3.2. Study of the coupling of chaotic dynamical systems, focusing mainly on the suppression of the chaotic behavior and synchronization.

3.3. Analysis of new situations for vector convexity conditions.

3.4. Mathematical models, based on the theory of dynamic systems, were applied to the area of tourism, producing a scientific article and to the area of education, producing a scientific report derived from a provision of services to the regional government of the Azores.

3.5. Daily, accessible to the public, on the social network Facebook, projections on the pandemic evolution in Portugal, which were also published in the digital newspaper of the Association for Science and Development of the Azores.

3.6. Study of dynamic systems that model the transport and movement of loads through cranes. These systems widely used in industry, are coupled, through cables, to a car that moves horizontally on rails. The movement of loads through this type of cranes can generate oscillatory movements, just like a pendulum, making its movement a difficult task when controlled only by the operator.

3.7. Development of forest management scheduling models that address wildfire risk, both at stand and landscape levels. Research work focused on Spatial optimization through the incorporation of concerns about 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 located in northwestern Portugal.

4. Statistics, Stochastic Processes and Applications (SSPA)

2.1. Stochastic Processes and Applications

- We have shown the existence of perpetual integral functionals $\int_0^\infty f(X(t)) dt$ for several classes of d -dimensional stochastic processes $X(t)$. The method is very simple: we establish the conditions supplying that these functionals have a finite expectation. Examples of these classes include d -dimensional fractional Brownian motion having coordinates with the same Hurst index H , for which existence is established under the assumption $d > 1/H$. In particular, perpetual integral functionals exist for d -dimensional Brownian motion with $d > 2$, compound Poisson process, Markov processes admitting densities of transitional probabilities. In the case of Brownian motion and fractional Brownian motion we establish that the perpetual integral functionals

are not a constant a.s. if $f \neq 0$.

- We studied Green measures for certain classes of random time change Markov processes where the random time change are inverse subordinators. We show the existence of the Green measure for these processes under the condition of the existence of the Green measure of the original Markov processes and they coincide. Applications to fractional dynamics are given.
- We consider random time changes in Markov processes with killing potentials. We study how random time changes may be introduced in these Markov processes with killing potential and how these changes may influence their time behavior. As applications, we study the parabolic Anderson problem, the non-local Schrödinger operators as well as the generalized Anderson problem.
- We investigated the long-time behavior of the subordination of the constant speed traveling waves by a general class of kernels. We use the Feller-Karamata Tauberian theorem in order to study the long-time behavior of the upper and lower wave. As a result, we obtain the long-time behavior for the propagation of the front of the wave.
- We studied the asymptotic behavior of random time changes of dynamical systems. As random time changes, we propose three classes which exhibit different patterns of asymptotic decays. The subordination principle may be applied to study the asymptotic behavior of the random time dynamical systems. It turns out that for the special case of stable subordinators explicit expressions for the subordination are known and its asymptotic behavior are derived. For more general classes of random time changes explicit calculations are essentially more complicated and we reduce our study to the asymptotic behavior of the corresponding Cesaro limit.
- We studied the long-time behavior of the Cesaro means of fundamental solutions for fractional evolution equations corresponding to random time changes in the Brownian motion and other Markov processes. We consider both stable subordinators leading to equations with the Caputo-Djrbashian fractional derivative and more general cases corresponding to differential-convolution operators, in particular, distributed order derivatives.
- We studied strong dissipativity of generalized time-fractional derivatives on Gelfand triples of properly in time weighted L^p -path spaces is proved. In particular, as special cases the classical Caputo derivative and other fractional derivatives appearing in applications are included. As a consequence one obtains the existence and uniqueness of solutions to evolution equations on Gelfand triples with generalized time-fractional derivatives. These equations are of type

$$\frac{d}{dt}(k * u)(t) + A(t, u(t)) = f(t), \quad 0 < t < T,$$

with (in general nonlinear) operators $A(t, \cdot)$ satisfying general weak monotonicity

conditions. Here k is a non-increasing locally Lebesgue-integrable nonnegative function on $[0, \infty)$ with $\lim_{s \rightarrow \infty} k(s) = 0$. Analogous results for the case, where f is replaced by a time-fractional additive noise, are obtained as well. Applications include generalized time-fractional quasi-linear (stochastic) partial differential equations. In particular, time-fractional (stochastic) porous medium and fast diffusion equations with ordinary or fractional Laplace operators and the time-fractional (stochastic) p -Laplace equations are covered.

- Options on bonds for the CIR model.
- Entry and exit decisions for real option models when the uncertainty variable price is modeled by alternative stochastic processes.
- Study of weakly self-avoiding fractional Brownian motion, with particular emphasis on a possible phase transition at a value of the Hurst index $H = 0.3$.

4.1. Survival Analysis Models

We have developed a new R package, called vsd (visualizing survival data). The results can be summarized as follows:

- One paper in an international journal
- One publication in proceedings of a national congress
- Two submissions for the proceedings of a national congress
- One presentation in an international congress
- Three presentations in national congresses
- Two master thesis concluded
- One master thesis in progress
- One PhD thesis in progress (co-orientation)
- One R package developed (co-authored)
- One review of an article for an international journal

4.2. Stochastic differential equation models

Within the Project of Action E (Growth models) of the Operational Group GOBovMais (Productivity improvement in the system of bovine raising for meat), using stochastic differential equation models:

- Determination of the optimal selling age and the optimal profit when raising and selling an animal for more complex and realistic profit functions and its application to mertolengo bovine males.
- Support for the development of a computer app tool for the use of the producers.
- Alternative estimation methods for the correction of biases due to lack of observations at animal older ages (bootstrapping, weighted maximum likelihood).

Also, with Nelson T. Jamba (student CIMA member, Doctoral Program in Mathematics, Universidade de Évora): Mixed models (including models with genetic values): approximate methods of estimation.

Models of population growth with fishing in a random environment (using stochastic differential equations) with and without Allee effects:

- New fishing policies and their optimization and comparison.
- First passage times.

4.3. Development of systems to prevent environmental risks due to floods and fires.

In the context of the Vimetri project for the development of systems to prevent environmental risks, a study was carried out to extract the water level of streams of Funchal channels using low-cost cameras based on Raspberry Pi. An experimental system was installed in a water stream to support the development of the model and validate the results.

Study of environmental parameters that affect the received signal on the 24 GHz link for precipitation measurement.

4.4. Realization, of maintenance and dissemination measurement standards in Portugal through National Metrology Laboratory of Portuguese Institute of Quality

J. Alves e Sousa is the head of the National Metrology Laboratory (NML) of IPQ (Portuguese Institute for Quality), comes the responsibility for supervising the scientific and applied metrology in Portugal (National Metrology Institute), and this entails a duty for the development, maintenance and dissemination of measurement standards in Portugal. Therefore, all activities are in the context of these two vectors, one associated with the scientific part of developing the primary measurement standards, which includes a scientific component of fundamental and applied research associated with research projects, publications, and international representation, and another, associated with laboratory activities to disseminate primary measurement standards and supporting the network of national accredited laboratories to maintain their measurement traceability to the International System of Units.

Concerning the scientific side, during 2021 IPQ has kept in the data base of BIPM (*Bureau International de Poids et Mesures*) 137 CMC (*Calibration Measurement Capabilities*) and 6 matrices, having participated in 7 international comparisons and 4 national comparisons, and been evaluated internationally in a *peer review* to fulfil the agreement established in the *Mutual Recognition Arrangement* (MRA) that provides international equivalence to the measurements carried out by IPQ-NML.

In terms of the participation in international projects, NML continued in 2021 the ongoing participation in 12 European projects in the context of the EURAMET EMPIR program and initiated the participation in other 4 projects (started in 2021 to be conclude in 2024). In 2021 another EURAMET program has started called European Partnership on Metrology (EPM), and 2 projects were approved to start in 2022. The signatory, besides being responsible for the research strategy of IPQ and promoting the participation of all scientific domains in this program, has an active participation in 3 of these projects (18NET05 MATHMET, 19NRM02 RevStdLED and 20NET01 Clean Energy).

Ongoing projects include projects initiated in 2018 that, due to the pandemic, have been extended for one year, plus all others initiated in the following year until 2021. Starting with those projects initiated in 2017:

- 17RPT02 rhoLiq (Establishing traceability for liquid density measurements)

- 17RPT03 DIG-AC (A digital traceability chain for ac voltage and current)

The projects initiated in 2019 (conclusion in 2022) are:

- 18NET05 MATHMET (Support for a European Metrology Network for Mathematics and Statistics)
- 18RPT01 ProbeTrace (Traceability for contact measurement probes and stylus instruments)
- 18HLT08 MeDD II (Metrology for drug delivery)
- 18RPT02 adOSSIG (Developing an infrastructure for improved and harmonised metrological checks of blood-pressure measurements in Europe)
- 18SIB02 Real-K (Realising the redefined kelvin)

One project initiated in 2020 (conclusion in 2023) is:

- 19NRM02 RevStdLED (*Revision and extension of standards for test methods for LED lamps, luminaires and modules*)

Finally, the projects initiated in 2021 are the following:

- Support for a European Metrology Network for Clean Energy
- Memristive devices as quantum standards for nanometrology
- Support for standardized seawater pH_T measurements in support of international and European climate strategies
- Establishing metrology standards in microfluidic devices

Regarding publications involving the NML a total of 51 new publications were registered in 2021, above the initial goal. A list with the signatory publications is shown below within the corresponding bullet point.

In addition, 3 master thesis were carried out in collaboration with nearby Universities of Lisbon and Polytechnic of Setúbal. Moreover, in the cooperation activity with the academia it should also be stressed the PhD thesis developed by NML staff and participation in external examination bodies of master thesis. Finally, there was the opportunity to organize important online events to overcome the limitations imposed by the pandemic, and in this way to keep close contact with the stakeholders. In a pandemic year there was not the possibility of participating in person in international conferences.

To demonstrate the international equivalence of its measurement standards and evaluate our quality management system with peers, the NML has participated in 7 international comparisons and 3 international audits.

For the support of the national accredited laboratories a total of 2500 calibrations were carried out in 2021 plus 5 interlaboratory comparisons, including the metrological characterization of itinerary measurement standards, data processing and statistical evaluation of the corresponding measurement uncertainty and final report.

4.5. Modeling and prediction of road traffic accidents in the district of Setúbal

MOPREVIS Project (Modelling and Prediction of Traffic Accidents in the District of Setúbal): identification of temporal and spatial factors in the occurrence, typology, and severity of road accidents; identification of the determinants factors for the typology and severity of road accidents; identification of the determinants factors for the occurrence of motorcycle road accidents; the influence of the confinement period on road accidents;

identification of factors related to the type of road in the typology and severity of road accidents.

4.6. Regression models and nonparametric two-way ANOVA

Study of the Type I error and power of the alternative tests for parametric two-way ANOVA with heteroscedastic errors and discrete data.

4.7. Sociodemographic effects in functioning and cognition

Comparison of the functioning profiles and cognition of institutionalized and noninstitutionalized older adults and to evaluate the effect of sociodemographic factors on the functioning and cognition.

4.8. Applications of statistical methods and techniques of data analysis

Development and validation of a clinical instrument for measuring wound characteristics; translation of the Pressure Ulcer Knowledge Test into Portuguese from Portugal and evaluation of its internal consistency; assessment of nurses' level of knowledge about pressure ulcers.

Analysis of mean sea level rise from tide gauge data located along the Portuguese coast; evaluation of the performance of tide gauges in the tidal network and presentation of quality control techniques for tidal data in near real-time; development of a new approach for tidal prediction on the Portuguese coast.

Some studies in the area of animal behavior were done.

Now I am preparing research on sampling methods in statistical quality control, with combined methods between adaptive and predetermined sampling (CAPSI-Combined Adaptive Predetermined Sampling Intervals) using an economic approach.

During this year I plan to apply the CAPSI method to EWMA and CUSUM charts.

Furthermore, I continue to participate in applied research in tourism, using quantitative methods in particular Categorical regression (multinomial and ordinal) and SEM.

This investigation resulted from the orientation of a PhD and a Pos doc, both in Tourism, at the Faculty of Economics, University of Algarve and as an integrated researcher in KIPT (Colab in Tourism).

Continuation of research in the area of Epidemiology and Public Health in collaboration with research projects, at national and international level, namely in the study of diseases such as Tuberculosis, HIV and Leprosy, through temporal, spatial and spatio-temporal approaches. This investigation resulted in:

- the scientific supervisors of students, national and international PhD, Master's and research fellows: 2 PhDs in national programs (in course), 2 PhDs in international programs (in course) and 2 Master's Research Scholarship (concluded)
- the publication of 4 articles in international journals (3 in quartile Q1 and 1 in quartile Q2)
- the approval of 1 article in an international journal
- submission of 8 articles in international journals
- 6 presentations in international congresses
- 2 presentations in national congresses
- Reviewer in national and international journals

In collaboration with Nelson Antunes and Vladas Pipiras continues the research on sampling problems of data packets in communications networks such as the Internet. The research results on an inversion problem and since these problems are ill-posed, regularization methods are needed to solve them. Through these methods, the

distribution of the flow size of Internet packets was estimated and a Gaussian TLC was deduced for the estimator obtained directly from the properties of the underlying operator.

Investigation of the structure of genotype-by-environment interaction by Regression Techniques.

Continuation of statistical research applied to the clinical area in close collaboration with research projects, at national and international level. Continuation of research in the operations research area specially in the area of optimization, efficiency analysis and project management.

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5. Research Lines

2021 was a transition year between the former research lines (Complex Systems (CS) and Mathematical Modelling in Life Sciences and Industry Applications (MMLSIA)) and the current lines Mathematical Modelling in Life Sciences and Applications (MMLSA) and Mathematics and Applications to Technology and Industry (MATI).

II. 2021 Indicators

A – Publications

A.1. Books

Books (author) of international circulation:

A1 Feliz Minhós, Robert de Sousa: Nonlinear Higher Order Differential and Integral Coupled Systems, Trends in Abstract and Applied Analysis, vol 10, World Scientific, ISBN: 978-981-122-512-3, June 2022, ISBN 978-981-122-512-3, 242 pags.
<https://doi.org/10.1142/11961>
<https://www.worldscientific.com/worldscibooks/10.1142/11961>

Books (editor) of international circulation:

A2 F. Minhós, J. Fialho, Nonlinear Differential Equations and Dynamical Systems: Theory and Applications, MDPI, Switzerland, 2021, pp. 146, ISBN 978-3-0365-0710-1 (Hbk) ISBN 978-3-0365-0711-8 (PDF).
<https://www.mdpi.com/books/pdfview/book/3603>
<https://doi.org/10.3390/books978-3-0365-0711-8>

A3 J. Martin-Vaquero, F. Minhós, J.L.G. Guirao, B. A. Wade, eds. Analytical and Numerical Methods for Differential Equations and Applications. Lausanne: Frontiers Media SA. 2021. doi: 10.3389/978-2-88971-424-7.

<https://www.frontiersin.org/research-topics/9300/analytical-and-numerical-methods-for-differential-equations-and-applications>

Books (editor) of national circulation:

A4 Book of Abstracts of SPE 2021. Editors: **Russell Alpizar-Jara, Dulce Gomes, Lígia Henriques-Rodrigues, Patrícia A. Filipe.** Edições SPE, 167 pages, ISBN: 978-972-8890-48-3,
http://www.spe2021.uevora.pt/wpcontent/uploads/2021/10/SPE2021_BookAbstracts.pdf

Book chapters of international circulation:

A5 J. Fialho, Key performance indicators and individual prediction models for penalty kicks, Recent Advances in Mathematical and Statistical Methods, Springer.

Print ISBN: 978-3-030-63590-9
Electronic ISBN: 978-3-030-63591-6

- A6 Pereira, D. G.,** Rodrigues, P. C., Mejza, I., Mejza, S., & Mexia, J. T. (2021). Structuring Genotype X Environment Interaction by Regression Techniques. Recent Progress in Plant and Soil Research Vol. 2, 1–14.
<https://doi.org/10.9734/bpi/rppsr/v2/2326F>

A.2. Scientific articles

Articles in international journals

- A7** Susete Marques, **Vladimir Bushenkov**, Alexander Lotov and José G. Borges (2021). Building Pareto Frontiers for Ecosystem Services Tradeoff Analysis in Forest Management Planning Integer Programs.- Forests, 2021, v.12, 1244, ISSN: 1999-4907.
<https://doi.org/10.3390/f12091244>
- A8** Rui Fragoso, **Vladimir Bushenkov**, Manoel João Ramos (2021). Multi-criteria supply chain network design using interactive decision maps.- Journal of Multi-Criteria Decision Analysis, Volume 28, Issue 5-6, p.220-233.
<https://doi.org/10.1002/mcda.1744>
- A9** Marco Marto, **Vladimir Bushenkov**, Keith Reynolds, José G. Borges, and Susete Marques (2021). A Web-Based Approach for Visualizing Interactive Decision Maps.- Information 2021, 12(1), 9. ISSN: 2078-2489.
<https://dx.doi.org/10.3390/info12010009>
- A10** Simões, A.M., **Carapau, F., Correia, P.**, New Sufficient Conditions to Ulam Stabilities for a Class of Higher Order Integro-Differential Equations, Symmetry, 2021, 13(11): 2068.
<https://doi.org/10.3390/sym13112068>
- A11** **Carlota, C., Chá, S.**, A new result on existence of minimizers for almost convex integrals, International Journal of Applied Mathematics and Statistics, 60 (1), (2021) 1-14.
ISSN 0973-1377 (Print), ISSN 0973-7545 (Online)
<http://www.ceser.in/ceserp/index.php/ijamas/article/view/6678>

- A12 F. Minhós, J. Fialho, R. de Sousa**, On coupled systems of Lidstone-type boundary value problems, *Mathematical Modelling and Analysis*, 26 (3), (2021) 358-371, <https://doi.org/10.3846/mma.2021.12977>
- A13 F. Minhós, I. Coxe**, Higher order functional discontinuous boundary value problems on the half-line, *Mathematics* 2021, 9, 499. <https://doi.org/10.3390/math9050499>
- A14 F. Minhós, R. de Sousa**, Heteroclinic and homoclinic solutions for nonlinear second-order coupled systems with phi-Laplacians, *Computational and Applied Mathematics* (2021) 40:169, <https://doi.org/10.1007/s40314-021-01556-w> <http://arxiv.org/abs/2003.14095>
- A15 J. Martin-Vaquero, B. Wade, J. L. Garcia, F. Minhós**, Editorial: Analytical and Numerical Methods for Differential Equations and Applications, *Front. Appl. Math. Stat.* 7:712813, doi: 10.3389/fams.2021.712813. <https://www.frontiersin.org/articles/10.3389/fams.2021.712813/full>
- A16 F. Minhós, R. Carapinha**, Functional coupled systems with generalized impulsive conditions with application to a SIRS model, *Journal of Function Spaces*, Volume 2021, Article ID 3758274, 10 pages, (2020). <https://doi.org/10.1155/2021/37582742021>
- A17 F. Minhós, N. Oliveira**, Periodic third-order problems with a parameter, *Axioms* 2021, 10, 222. <https://doi.org/10.3390/axioms10030222> <https://www.mdpi.com/2075-1680/10/3/222>
- A18 R. de Sousa, F. Minhós**, Existence and location of solutions to fourth-order Lidstone coupled systems with dependence on odd derivatives, *Advances in Operator Theory*, 6, Article number:10 (2021). <https://doi.org/10.1007/s43036-020-00105-2> <https://link.springer.com/article/10.1007%2Fs43036-020-00105-2#citeas>
- A19 Pereira, F.F.**, A directional curvature formula for convex bodies in $\mathbb{R}^n$, *J. Math. Anal. Appl.* 506 (2022). <https://doi.org/10.1016/j.jmaa.2021.125656>
- A20 J. C. Rosales, M. B. Branco**, Algorithms for calculating the set of integers contained in a monoid finitely generated by positive rational numbers, *Applied and Computational Mathematics*, Vol. 20 (3) (2021): 381-389, Azerbaijan National Academy of Sciences.
- A21 M. B. Branco, M. C. Faria and J. C. Rosales**, Almost-Positioned Numerical Semigroups, May 2021 *Results in Mathematics* 76(2) DOI:10.1007/s00025-021-01372-y

- A22** J. C. Rosales, M. B. Branco, and M. C. Faria, Dense numerical semigroups, Semigroup Forum <https://doi.org/10.1007/s00233-021-10190-1>
- A23** J. C. Rosales, M. B. Branco and Márcio André Traesel, \emph{Modularly equidistant numerical semigroups}, Turkish Journal of Mathematics, (2021) 45: 288-299,
- A24** Enrique Arrondo, Alessandra Bernardi, **Pedro Macias Marques**, Bernard Mourrain, Skew-Symmetric Tensor Decomposition, Communications in Contemporary Mathematics 23 (2021), no. 2, 1950061, 29 pp., ISSN (print): 0219-1997, ISSN (online): 1793-6683.
- A25** Anthony Iarrobino, **Pedro Macias Marques**, Symmetric Decomposition of the Associated Graded Algebra of an Artinian Gorenstein Algebra, Journal of Pure and Applied Algebra 225 (2021), no. 3, 106496, 49 pp., ISSN 0022-4049.
- A26** Chris McDaniel, Shujian Chen, Anthony Iarrobino, **Pedro Macias Marques**, Free extensions and Lefschetz properties, with an application to rings of relative coinvariants, Linear and Multilinear Algebra 69 (2021), no. 2, 305-330, ISSN 0308-1087.
- A27** R. Albuquerque, *The Euler characteristic of hypersurfaces in space forms and applications to isoparametric hypersurfaces*, Pacific Journal of Mathematics, Vol. 312, No. 2, 2021, pp. 257-277, <https://doi.org/10.2140/pjm.2021.312.257>
- A28** R. Albuquerque, *New Hsiung-Minkowski identities*, Jour. of Geometric Analysis, 31, 9915–9927 (2021), <https://doi.org/10.1007/s12220-021-00631-2>
- A29** Marco Garapa (2021). Selective Base Revisions. Journal of Philosophical Logic. ISSN 0022-3611, <https://doi.org/10.1007/s10992-021-09606-8>
- A30** Frias, A.; Raskova, E.; Costa, Á.; Cabral, J. Obtaining Data Values from Tourist Preferences. Sustainability 2021, 13, 10276. <https://doi.org/10.3390/su131810276>
- A31** Sara Perestrelo, Maria Grácio, Nuno Ribeiro and Luís Mário Lopes, “Modelling Forest Fires Using Complex Networks”, Mathematical and Computational Applications, MDPI, 2021
- A32** Daniele, Patrizia; Fulga, Cristinca; Martín-Herrán, Guiomar; Mazalov, Vladimir; Petrosyan, Leon; Oliveira, Bruno M. P. M.; Ramos, Carlos; Weber, Gerhard-Wilhelm; Zenkevich, Nikolay Foreword: special issue: "Euro 2019: games in economics, finance and biology". J. Dyn. Games 8 (2021), no. 2, i–iv. <https://www.aims sciences.org/article/doi/10.3934/jdg.2021016>
- A33** Correia Ramos, C.; Martins, N.; Pinto, P. R. Markov invariant dynamics. Linear Algebra Appl. 620 (2021), 268–296. <https://www.sciencedirect.com/science/article/pii/S0024379521000951?via%3Dihub>

- A34** Kondratiev, Y.; **da Silva, J.L.** Asymptotic Behavior of the Subordinated Traveling Waves. *J Stat Phys* 2021, 183, 7, 1-17, ISSN: 0022-4715, <https://doi.org/10.1007/s10955-021-02745-x>.
- A35** **da Silva, J.L.**; Kondratiev, Y. Cesaro Limits for Fractional Dynamics. *Fractal and Fractional* 2021, 5, 12, 1-12, ISSN: 2504-3110, <http://doi.org/10.3390/fractalfract5040133>
- A36** **da Silva, J.L.**; Kondratiev, Y. GREEN MEASURES FOR TIME CHANGED MARKOV PROCESSES. *Methods Funct. Anal. Topology* 2021, 27, 227–236, ISSN:1029-3531, https://doi.org/10.31392/mfat-npu26_3.2021.04
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A.3. Articles in Proceedings

Proceedings of international events

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- A73** L. Silva, P. Gomes, N. Franco, Classification of a family of Lorenz knots with reducible symbolic sequences, Editors: Walter Lacarbonara, Balakumar Balachandran, Michael J. Leamy, Jun Ma, J. A. Tenreiro Machado, Gabor Stepan, Advances in Nonlinear Dynamics, Proceedings of the Second International Nonlinear Dynamics Conference (NODYCON 2021), Volume 3, Springer Verlag
- A74** **João Cabral**, *Ergodic Theory, Chaos and its application in the study of lichens of the Cladonia species* , UAciência, National Agency for Scientific and Technological Culture https://noticias.uac.pt/wp-content/uploads/2021/01/Revista-24_01_2021-12178-06e07-Uaciencia-Edicao.pdf
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Proceedings of national events

- A77** O. Pellegrino, S. Gentil, **J.A. Sousa**, I. Godinho (2021) Writing rules of the measurement results in Chemistry, *Book of Abstracts of the 14th Encontro Nacional de Química-Física* online, Coimbra, 2021
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- A79** I. Sousa-Ferreira, C. Rocha, **A. M. Abreu** (under review). The extended Chen-Poisson marginal rate model for recurrent gap time data. Em R. Alpizar-Jara, M. de Carvalho, R. Bispo e L. Henriques-Rodrigues (eds.), *Proceedings of XXV Congress of the Portuguese Statistical Society*, Springer. Submitted, nov, 2021
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A.4. Edited special issues of journals

- A82** **Feliz Minhós**, Invited editor of the Special Issue "Advances on Nonlinear Boundary Value Problems: Theory and Applications" , *Axioms* (ISSN 2075-1680), MDPI, Switzerland.
[https://www.mdpi.com/journal/axioms/special issues/nonlinear boundary value problem](https://www.mdpi.com/journal/axioms/special%20issues/nonlinear%20boundary%20value%20problem)
- A83** **Feliz Minhós**, Invited editor of the Special Issue "Analytical and Numerical Methods for Differential Equations and Applications" , *Frontiers in ICT, Electronic* ISSN: 2297-198X, Frontiers, Switzerland.
<https://www.frontiersin.org/research-topics/9300/analytical-and-numerical-methods-for-differential-equations-and-applications>

A84 **João Cabral** , Invited editor of the Special Issue "Intelligent Tools and Applications in Engineering and Mathematics", Entropy (ISSN 1099-4300), section "Multidisciplinary Applications".

https://www.mdpi.com/journal/entropy/special_issues/intelligent_tools

A85 **João Cabral** , Invited editor of the Special Issue "Applied Mathematical Modelling and Dynamical Systems". of Mathematics (ISSN 2227-7390), section "Dynamical Systems".

https://www.mdpi.com/journal/mathematics/special_issues/Applied_Mathematical_Modelling_Dynamical_Systems

B – Communications

Communications at international events

- B1.** Susete Marques and **Vladimir Bushenkov**, Decomposition approach for solving multi-criteria integer programming problems: the case of forestry management in Portugal. - Dynamic Control and Optimization International Conference (DCO21), Aveiro, February 3 to 5, 2021.
https://drive.google.com/file/d/1NhI2Y7ml0nSvg_JLpzvuPHh5HJwDkhMA/view
- B2.** Eduardo Eloy, **Vladimir Bushenkov** and Salvador Abreu. A constraint modeling approach for forest management. - Dynamic Control and Optimization International Conference (DCO21), Aveiro, February 3 to 5, 2021.
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- B3.** Marques, S. & **Bushenkov**, V. Building Pareto Frontiers for Ecosystem Services Tradeoff Analysis in Forest Management Planning. - BIOECOSYS Final Conference, December 6, 2021, Lisbon.
<https://www.bioecosys.com/conference-programme>
- B4.** Eloy, E., **Bushenkov**, V., Abreu, S. A Constraint Modeling Approach for Forest Management. - BIOECOSYS Final Conference, December 6, 2021, Lisbon.
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- B5.** [5] NRW, 165th European Study Group with Industry, 16th April, 2021 (online), Durham University, Durham, UK
(https://www.maths.dur.ac.uk/events/Meetings/ESGI_165/), Communication-answer to the Problem presented by 'NRW (Natural Resources Wales)': "Encouraging Safe, Green and Economically Sustainable use of our Natural Environment", contributors: M. Aleandri, S. Abrahams, A. Berryman, G. Brennan, C. Budd, **J.M.C. Correia**, E. Donlon, S. Kamperis, D. Mckinnell, B. Metherall, F. Millward, J. Roberts, K. Yu, F. Zeng
(<http://hdl.handle.net/10174/29905>)
- B6.** **Pereira, F.F.**, A Directional Curvature Formula for Convex Bodies in R^n , Dynamic Control and Optimization, Aveiro (Portugal), Fevereiro 2021.
<https://sites.google.com/view/dco2021>
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- B7.** **Imme van den Berg**, Nam Van Tran, International conference , Dynamic Control and Optimization (DCO 2021), 3-5 February 2021, Aveiro;: Non-linear optimization with a perturbed objective function, [DCO2021_feb_2021.pdf \(ua.pt\)](#), p.28.
- B8.** **Sara Fernandes, Luís Mário Lopes and Maria Clara Grácio**, "Coupling, chaos and stabilization strategy", SymComp 2021, 5th International Conference on Numerical and Symbolic Computation Developments and Applications

- B9.** Rosário Laureano, **Clara Grácio, Luis Mário Lopes and Sara Fernandes**, “Several approaches to synchronization”, SymComp 2021, 5th International Conference on Numerical and Symbolic Computation Developments and Applications
- B10.** **Sara Perestrelo, Maria Grácio, Nuno Ribeiro and Luís Mário Lopes**, “Modelling Forest Fires Using Complex Networks”, SymComp 2021, 5th International Conference on Numerical and Symbolic Computation Developments and Applications
- B11.** **C. Correia Ramos**, Symbolic dynamics and natural computing, 14th The Cape Verde International Days on Mathematics, CVIM'2021
<https://sites.google.com/view/cvim2021>
- B12.** **L. Bandeira and C. Ramos**, “Vibrational Properties of Non-Homogeneous Materials”, 5th International Conference on Numerical and Symbolic Computation Developments and Applications, 25-26/3/2021, Évora (online), Portugal,
<http://www.symcomp2021.uevora.pt/index.htm> ,
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- B13.** **L. Silva, P. Gomes, N. Franco**, Classification of a family of Lorenz knots with reducible symbolic sequences, NODYCON 2021, 16-19 February 2021, Rome-Italy,
<https://nodycon.org/2021/>,
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- B14.** **L. Silva**, Nonautonomous Milnor attractors on flat topped tent maps, ICDEA 2021, 26-30 July 2021, Sarajevo – Bosnia,
<https://icdea2021.pmf.unsa.ba><https://pmf.unsa.ba/wp-content/uploads/2021/07/ICDEA2021-July-23-abs.pdf>
- B15.** **Alexandra Nascimento, Diogo Baptista**, Liliana Ferreira, Rui Santos e Susana Ferreira, Science Workchestra – Transdisciplinarity proposals, 2021 International Conference Computational and Mathematical Methods in Science and engineering (CMMSE) / First conference on high performance computing (CHPC) , 21/07 a 27/07, Cádiz; <https://cmmse.usal.es/cmmse2021/welcome>
- B16.** Liliana Ferreira, **Alexandra Nascimento Baptista**, Miguel Constantino, Isabel Martins, Susete Marques, José Borges, **Vladimir Bushenkov**, Integrating wildfire resistance into a multicriteria approach for Portuguese Forest management , Canadian Operational Research Society International Conference, 07/06/2021 a 10/06/2021, Toronto, Canadá
<https://uwaterloo.ca/canadian-operational-research-society-conference>
- B17.** Liliana Ferreira, **Alexandra Nascimento Baptista**, Miguel Constantino, Isabel Martins, Susete Marques, José Borges, **Vladimir Bushenkov**, Forest ecosystem management integrating spatial optimization - an approach in Portugal, 31st European Conference on Operational Research (EURO 2021), 11/07/2021 a 14/07/2021, Atenas, Grécia, <https://euro2021athens.com/> ,
https://www.euro-online.org/conf/euro31/treat_abstract?frompage=edit_session&sessid=319337&paperid=2866

- B18.** Liliana Ferreira, **Alexandra Nascimento Baptista**, Miguel Constantino, Isabel Martins, Susete Marques, José Borges, **Vladimir Bushenkov**, Integrating wildfire resistance and clearcut constraints into a forest ecosystem management approach, Final Conference of the Bioecosys project, 06/12/2021, Lisboa,
<https://www.bioecosys.com/bioecosys-conference>
- B19.** 2nd International Workshop on Stochastic Processes and Their Applications (IWSPA 2021), virtual, November 23, 25, 30 + December 2,
<http://blogs.mat.ucm.es/presa/workshop2021/>
Braumann, C. A. (presenter); **Jacinto, G.**; **Filipe, P. A.** Profit optimization for a stochastic model of cattle growth and variable price categories.
Abstract in: *2nd International Workshop on Stochastic Processes and their Applications. Program and Abstracts*, p.10-11,
http://blogs.mat.ucm.es/presa/wp-content/uploads/sites/45/2021/11/IWSPA2021_BoA-1.pdf
- B20.** 2nd Online International Conference on Nonlinear Dynamics and Complexity (NDC2021), ISEP, October 4-6, 2021,
<https://www.isep.ipp.pt/New/ViewNew/6409>
Brites, N. M. (presenter); **Braumann, C. A.** Stochastic differential equations optimal harvesting policies: moments and probability density of threshold crossing times.
- B21.** V Latin American Conference on Statistical Computing (LACSC 2021), virtual, April 19-21, 2021, <http://lacsc2020.itam.mx/>
Brites, N. M. (presenter); **Braumann, C. A.** Optimal harvesting policies in random environments: estimation of moments and density of first passage times.
Abstract in: *LACSC2021 Proceedings: V Latin American Conference on Statistical Computing* (L.A. Moncayo-Martinez, D.F. Muñoz, editors), Sello Editorial ITAM, 2021, p. 97, <http://lacsc2020.itam.mx/index.php/program/>
- B22.** Dynamic Control and Optimization International Conference on occasion of 65th birthday of Andrey V. Sarychev, virtual, February 3-5, 2021,
<https://sites.google.com/view/dco2021>
Brites, N. M. (presenter); **Braumann, C. A.** Estimation of moments and density of first passage times for optimal sustainable harvesting policies in random environments.
Abstract in: *International Conference on Dynamic Control and Optimization - DCO 2021: Book of Abstracts* (J.P. Cruz; T. Tchemisova, editors), UA Editora, Universidade de Aveiro, ISBN 978-972-789-675-2, p. 22-23,
<https://doi.org/10.34624/vf5g-vv39>,
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- B23.** Dynamic Control and Optimization International Conference on occasion of 65th birthday of Andrey V. Sarychev, virtual, February 3-5, 2021,
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Jacinto, G. (presenter); **Filipe, P. A.**; **Braumann, C. A.** Individual growth modelling with stochastic differential equations.
Abstract in: *International Conference on Dynamic Control and Optimization - DCO 2021: Book of Abstracts* (J.P. Cruz; T. Tchemisova, editors), UA Editora, Universidade de Aveiro, ISBN 978-972-789-675-2, p. 24-25,

<https://doi.org/10.34624/vf5g-vv39>,
https://ria.ua.pt/bitstream/10773/30706/1/DCO2021_feb_2021.pdf

- B24.** POSTER- V Latin American Conference on Statistical Computing (LACSC 2021), virtual, April 19-21, 2021, <http://lacsc2020.itam.mx/>
Jamba, N. T. (presenter); **Filipe, P. A.**; **Jacinto, G.**; **Braumann, C. A.** Mixed models for individual growth in random environment through Laplace approximation.
Abstract in: *LACSC2021 Proceedings: V Latin American Conference on Statistical Computing* (L.A. Moncayo-Martinez, D.F. Muñoz, editores), Sello Editorial ITAM, 2021, p. 117, <http://lacsc2020.itam.mx/index.php/program/>
NOTE: Nelson T. Jamba, student at the Évora University Doctoral Program in Mathematics, won with this poster the IASC-LARS Best Poster Award (International Association for Statistical Computing - Latin American Regional Section), delivered at the 63th ISI World Statistics Congress (ISI 2021).
- B25.** CONTRIBUTED ABSTRACT presentation- 12th International Conference on Dynamical Systems Applied to Biology and Natural Sciences (DSABNS 2021), virtual, February 2-5, 2021, <https://wp.bcamath.org/dsabns21/>
Brites, N. M.; **Braumann, C. A.** Optimal sustainable harvesting policies in random environments: estimation of moments and density of first passage times.
Abstract in: *12th International Conference Dynamical Systems Applied to Biology and Natural Sciences (DSABNS) - Book of Abstracts*, Basque Center for Applied Mathematics, BCAM, Bilbao, Spain, ISBN: 978-989-98750-8-1, p. 78-80, https://wp.bcamath.org/dsabns21/?page_id=2000
- B26.** E. Batista, **J. Alves e Sousa**, S. Cardoso, V. Silverio, Flow measurements in a lab-on-a-chip device: metrological traceability and accuracy, *CIM2021*, September 2021
- B27.** **João A. Sousa**, Thermal Comfort modelling and uncertainties, EMUE project Measurement Uncertainty training, March 22, 2021
- B28.** Sousa-Ferreira, I., Rocha, C. e **Abreu, A. M.**, A flexible marginal rate model for recurrent events with a zero-recurrence proportion. The 35th International Workshop on Statistical Modelling, Bilbao, Spain. July, 2021, [IWSM2021 – International Workshop on Statistical Modelling \(bcamath.org\)](https://www.bcamath.org/IWSM2021-InternationalWorkshoponStatisticalModelling)
- B29.** de Sousa, B., Pires, C., **Gomes, D.**, **Filipe, P.A.**, Costa-veiga, A. and Nunes, C. STAR Modeling in the battle against Pulmonary Tuberculosis: risk areas and associated risk factors. 14th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2021), 18-20 December 2021, Londres, Inglaterra. <http://www.cmstatistics.org/CMStatistics2021/>
- B30.** Alves, L., Tavares, R., Ramos, A., Berra, T., Alves, Y., Costa, F., Santos, F., Souza, L., **Gomes, D.** and Arcêncio, R. Spatial analysis of TB and Covid-19 in Brazil, 2019-2020. In 52nd Union World Conference on Lung Health, 19-22 October 2021 (virtual event). <https://conf2021.theunion.org/>
- B31.** Berra, T., Alves, Y., Scholze, A., Giacomet, C., Moura, H., Alves, L., Santos, M., Souza, L., **Gomes, D.** and Arcêncio, R. Identification of vulnerable areas for TB control in Ribeirão Preto, São Paulo, Brazil. In 52nd Union World Conference on

Lung Health, 19-22 October 2021 (virtual event). <https://conf2021.theunion.org/>

- B32.** Alves, Y., Berra, T., Costa, F., Ramos, A., Souza, L., Alves, L., Santos, F., Scholze, A., **Gomes, D.** and Arcêncio, R. Spatial analysis of TB treatment outputs, Brazil. In 52nd Union World Conference on Lung Health, 19-22 October 2021 (virtual event) <https://conf2021.theunion.org/>
- B33.** Alves, Y., Berra, T., Costa, F., Ramos, A., Souza, L., Santos, M., Barbosa, T., **Gomes, D.** and Arcêncio, R. Associação Espacial para Tuberculose Infantil em Município Endêmico de São Paulo. In VIII workshop Rede TB (virtual), 25 a 28 de Outubro, 2021. <https://redetb.org.br/viii-workshop/>
- B34.** Alves, Y., Berra, T., Costa, F., Ramos, A., Souza, L., Santos, M., Moura, H., **Gomes, D.** and Arcêncio, R. Tuberculose infantil e vulnerabilidade social: fatores associados em um município brasileiro endêmico. In VIII workshop Rede TB (virtual), 25 a 28 de Outubro, 2021. <https://redetb.org.br/viii-workshop/>
- B35.** Furtado, K., **Infante, P., Afonso, A.,** Lopes, M., Sobral, A., Garcia, C., Tavares, B., Modelo de Investigação ELCOS para Instituições, Mesa Redonda "Investigação, Formação e Inovação em Feridas" do 12º Fórum Internacional de Úlceras e Feridas, 5 e 6 de Março de 2021, Live Streaming
- B36.** Correia, E., Sousa, S., Viseu, C. and **Larguinho, M.** Understanding Green Purchase Behavior. Is Gender Important? 2nd ICESA, Virtual Conference, November 21 – 23, 2021. <https://2021.esaconference.com/>
- B37.** **Larguinho, M.,** Sousa, S., Correia, E. and Viseu, C. The Influence of Companies' Environmental Communication in Green Purchasing: The Consumers' Perspective. 9th ICCMI, virtual Conference, September 3 – 5, 2021. <https://iccmi2021.org/>
- B38.** Sousa, S., Correia, E., Viseu, C. and **Larguinho, M.** Green Purchasing Behavior: Exploring the Importance of Consumers' Socioeconomic Characteristics. 36th EBES CONFERENCE, ISTANBUL, TURKEY, JULY 1-3, 2021. <https://ebesweb.org/conferences/past-conferences/36th-ebes-conference-istanbul/36th-ebes-conference-istanbul/>
- B39.** **Ludwig Streit** at Conf. "Urbanization in South East Asia: Pattern, Impact, and Sustainability", Sept. 20-22, 2021, Universitas Pembangunan Jaya, Jakarta: "THE URBAN LABORATORY: GOVERNANCE IN THE ERA OF COMPLEXITY AND ACCELERATION", <https://consortium.upj.ac.id/static-page/96/urban-conference>
- B40.** XII RUSI (Reunião sobre Ungulados Silvestres Ibéricos) . October 1-2, Campus Universitário da UTAD - Universidade de Trás-os-Montes e Alto Douro, em Vila Real (Portugal). <https://reuniaoungulados.wixsite.com/rusi/vi-rusi>. Strip sampling vs line transect sampling. What is the best method to estimate deer faecal abundance in high-density populations? Cláudio Bicho, **Russell Alpizar-Jara** & Pedro Santos. <https://reuniaoungulados.wixsite.com/rusi/ayuda>

Invited communications at international events

- B41.** Pires, M., Bodnár, T. Numerical Tests of Vanishing Diffusion Stabilization in Oldroyd-B Fluid Flow Simulations, Topical Problems of Fluid Mechanics 2021, Institute of Thermomechanics of the Czech Academy of Sciences, Praga, República Checa (February 17 - 19, 2021). <http://www2.it.cas.cz/fm/im/im/>
- B42.** Braumann, C. A. (INVITED SPEAKER); Jacinto, G.; Filipe, P. A. Profit optimization of cattle growth with variable price categories. 12th International Conference on Dynamical Systems Applied to Biology and Natural Sciences (DSABNS 2021), virtual, February 2-5, 2021, <https://wp.bcamath.org/dsabns21/>
- B43.** Brites, N. M.; Braumann, C. A. Harvesting optimization in a random environment: the optimal enemy of the good?, 5th International Workshop on Branching Processes and their Applications (IWBPA2021), virtual, April 6, 8, 13, 15, 20, 22, 2021, <https://sites.google.com/view/iwbpa21-branching-unex/home>
- B44.** Brites, N. M.; Braumann, C. A., Harvesting optimization in a randomly varying environment. Virtual Society for Mathematical Biology 2021 Annual Meeting (SMB2021), June 13-17, 2021, <https://www.smb2021.org/>
- B45.** Ana Paula Canavarro, Paulo Correia, Pedro Macias Marques, Afinal, como estamos de programa de Matemática no Ensino Básico?, ProfMat 2021, Santarém, 3rd July 2021

Communications at national events

- B46.** R. de Sousa and F. Minhós, On coupled systems of Lidstone-type boundary value problems, November 17, 2021, Jornadas de Matemática Gulbenkian 2021 Palop, Universidade do Porto. <https://www.fc.up.pt/tec.edu/jornadasdematematica/resumos-das-apresentacoes/#robert>
- B47.** Congresso da Sociedade Portuguesa de Estatística, virtual, organized by Évora University with CIMA support, October 13-16, 2021, <http://www.spe2021.uevora.pt>
Braumann, C. A. (presenter); Jacinto, G.; Filipe, P. A. Profit optimization for SDE cattle growth models using a general profit structure.
Abstract in: *Book of Abstracts of SPE 2021* (Russell Alpizar-Jara et al., editors), Sociedade Portuguesa de Estatística, ISBN: 978-972-8890-48-3, p. 54,

http://www.spe2021.uevora.pt/wp-content/uploads/2021/10/SPE2021_BookAbstracts.pdf

- B48.** XXV Congresso da Sociedade Portuguesa de Estatística, virtual, organized by Évora University with CIMA support, October 13-16, 2021, <http://www.spe2021.uevora.pt>
Jacinto, G. (presenter); **Filipe, P. A.**; **Braumann, C. A.** Profit optimization with sensitivity analysis for cattle growth using Gompertz and Bertalanffy-Richards SDE models.
Abstract in: *Book of Abstracts of SPE 2021 (Russell Alpizar-Jara et al., editors)*, Sociedade Portuguesa de Estatística, ISBN: 978-972-8890-48-3, p. 84, http://www.spe2021.uevora.pt/wp-content/uploads/2021/10/SPE2021_BookAbstracts.pdf
- B49.** XXV Congresso da Sociedade Portuguesa de Estatística, virtual, organized by Évora University with CIMA support, October 13-16, 2021, <http://www.spe2021.uevora.pt>
Filipe, P. A. (presenter); **Jacinto, G.**; **Braumann, C. A.** Weighted maximum likelihood estimation for SDE individual growth models.
Abstract in: *Book of Abstracts of SPE 2021 (Russell Alpizar-Jara et al., editors)*, Sociedade Portuguesa de Estatística, ISBN: 978-972-8890-48-3, p. 74, http://www.spe2021.uevora.pt/wp-content/uploads/2021/10/SPE2021_BookAbstracts.pdf
- B50.** XXV Congresso da Sociedade Portuguesa de Estatística, virtual, organized by Évora University with CIMA support, October 13-16, 2021, <http://www.spe2021.uevora.pt>
Jamba, N. T. (presenter); **Filipe, P. A.**; **Jacinto, G.**; **Braumann, C. A.** Mixed models for individual growth in random environments through Laplace and delta method approximation methodologies.
Abstract in: *Book of Abstracts of SPE 2021 (Russell Alpizar-Jara et al., editors)*, Sociedade Portuguesa de Estatística, ISBN: 978-972-8890-48-3, p. 85, http://www.spe2021.uevora.pt/wp-content/uploads/2021/10/SPE2021_BookAbstracts.pdf
- B51.** POSTER- XXVIII Jornadas de Classificação e Análise de Dados (JOCLAD2021), December 9-11, 2021, Covilhã, <http://www.joclad.ipt.pt/joclad2021/>
Jamba, N. T.; **Filipe, P. A.** (presenter); **Jacinto, G.**; **Braumann, C. A.** Likelihood function approximation through the delta method in mixed SDE models.
Abstract in: *Program and Book of Abstracts XXVIII Meeting of the Portuguese Association for Classification and Data Analysis (JOCLAD 2021)* (J.G. Dias et al., editors), p. 105-106, http://www.joclad.ipt.pt/download/8/bookofabstracts_joclad2021.pdf
- B52.** XXV Congresso da Sociedade Portuguesa de Estatística, virtual, organized by Évora University with CIMA support, October 13-16, 2021, <http://www.spe2021.uevora.pt>
Sousa-Ferreira, I. (presenter); Rocha, C.; **Abreu, A. M.** The extended Chen-Poisson marginal rate model for recurrent gap time data.
Abstract in: *Book of Abstracts of SPE 2021 (Russell Alpizar-Jara et al., editors)*, Sociedade Portuguesa de Estatística, ISBN: 978-972-8890-48-3, p. 132,

http://www.spe2021.uevora.pt/wp-content/uploads/2021/10/SPE2021_BookAbstracts.pdf

- B53.** XXV Congresso da Sociedade Portuguesa de Estatística, virtual, organized by Évora University with CIMA support, October 13-16, 2021, <http://www.spe2021.uevora.pt>
Camacho, P. D. (presenter); **Abreu, A. M.** vsd - Visualizing survival data.
Abstract in: *Book of Abstracts of SPE 2021 (Russell Alpizar-Jara et al., editors)*, Sociedade Portuguesa de Estatística, ISBN: 978-972-8890-48-3, p. 142, http://www.spe2021.uevora.pt/wp-content/uploads/2021/10/SPE2021_BookAbstracts.pdf
- B54.** Ciência 2021 – Encontro com a Ciência e Tecnologia em Portugal, June, 28-30, 2021, [Ciência 2021 - Encontro com a Ciência e Tecnologia em Portugal \(encontrociencia.pt\)](http://ciencia2021.uevora.pt/encontrociencia.pt)
Sousa-Ferreira, I. (presenter); Rocha, C.; **Abreu, A. M.** A gap time model based on restricted cubic splines with a zero-recurrence proportion.
- B55.** AlgarMat 2021- Encontro Regional de Professores de Matemática, 6 a 9 de Setembro, 2021. **Gomes, D.**, Santos, L. e Brunheira, L. Um olhar sobre os novos documentos curriculares de Matemática para os Ensino Básico. <https://apmnucleodoalgarve.weebly.com/algarimat2021programa.html>
- B56.** XXV Congresso da Sociedade Portuguesa de Estatística, virtual, organized by Évora University with CIMA support, October 13-16, 2021, <http://www.spe2021.uevora.pt>. **Gomes, D.**, Zamboni, T., Ramos, A. e Arcêncio, R. Hierarchical clustering algorithms in classification of the spread of COVID-19 cases and deaths in European countries. Abstract in: *Book of Abstracts of SPE 2021 (Russell Alpizar-Jara et al., editors)*, Sociedade Portuguesa de Estatística, ISBN: 978-972-8890-48-3, p. 148, http://www.spe2021.uevora.pt/wp-content/uploads/2021/10/SPE2021_BookAbstracts.pdf
- B57.** XXV Congresso da Sociedade Portuguesa de Estatística, virtual, organized by Évora University with CIMA support, October 13-16, 2021, <http://www.spe2021.uevora.pt>
Infante, P., Afonso, A., Jacinto, G., Rego, L., Cesar, R., Nogueira, P., Silva, M., Nogueira, V., Saias, J., Quaresma, P., Santos, D., Gois, P., Manuel, P. R. Alguns determinantes para uma maior gravidade da sinistralidade rodoviária no distrito de Setúbal.
Abstract in: *Book of Abstracts of SPE 2021 (Russell Alpizar-Jara et al., editors)*, Sociedade Portuguesa de Estatística, ISBN: 978-972-8890-48-3, p. 82, http://www.spe2021.uevora.pt/wp-content/uploads/2021/10/SPE2021_BookAbstracts.pdf
- B58.** Jornadas ICT, virtual, organized by ICT, February 11-12, 2021, <https://www.icterra.pt/>
Silva, M., Nogueira, P., **Infante, P., Afonso, A.** Ferramentas de análise espacial aplicadas à definição de pontos críticos. Aplicações ao projeto MOPREVIS.
Abstract in: *Livro de Resumos, Instituto Ciências da Terra*, p. 45-46.
- B59.** Poster - XXV Congresso da Sociedade Portuguesa de Estatística, virtual, organized by Évora University with CIMA support, October 13-16, 2021,

<http://www.spe2021.uevora.pt>

Pereira, D.G., Afonso, A. Comparação das abordagens semi-paramétricas à ANOVA com dois fatores na presença de heterocedastidade

Abstract in: *Book of Abstracts of SPE 2021 (Russell Alpizar-Jara et al., editors)*, Sociedade Portuguesa de Estatística, ISBN: 978-972-8890-48-3, p. 157,

http://www.spe2021.uevora.pt/wp-content/uploads/2021/10/SPE2021_BookAbstracts.pdf

- B60.** XXV Congresso da Sociedade Portuguesa de Estatística, virtual, organized by Évora University with CIMA support, October 13-16, 2021, <http://www.spe2021.uevora.pt>

Carinhas, D., **Infante, P.**, Martinho, A., Vasquez, F. As marés ao serviço da variação do nível médio do mar,

Abstract in: *Book of Abstracts of SPE 2021 (Russell Alpizar-Jara et al., editors)*, Sociedade Portuguesa de Estatística, ISBN: 978-972-8890-48-3, p. 60,

http://www.spe2021.uevora.pt/wp-content/uploads/2021/10/SPE2021_BookAbstracts.pdf

- B61.** **Afonso, A., Pereira, D.G.**, Gonçalves, A. C. A hurdle-gamma regression model for the average number of undeveloped pine nuts per cone. Poster - XXVIII Jornadas de Classificação e Análise de Dados (JOCLAD2021), December 9-11, 2021, Covilhã, <http://www.joclad.ipt.pt/joclad2021/>

- B62.** **Infante, P., Afonso, A., Jacinto, G.**, Rego, L., Nogueira, P., Silva, M., Nogueira, V., Saias, J., Quaresma, P., Gois. P., Manuel, P. R. A longitudinal analysis of the severity of road accidents in the district of Setúbal between 2016 and 2019. Poster - XXVIII Jornadas de Classificação e Análise de Dados (JOCLAD2021), December 9-11, 2021, Covilhã, <http://www.joclad.ipt.pt/joclad2021/>

- B63.** **Infante, P., Jacinto, G., Afonso, A.**, Cesar, R., Nogueira, P., Silva, M., Nogueira, V., Saias, J., Quaresma, P., Gois. P., Manuel, P. R.. Determinants for the existence of victims in road accidents in the district of Setúbal. Poster - XXVIII Jornadas de Classificação e Análise de Dados (JOCLAD2021), December 9-11, 2021, Covilhã, <http://www.joclad.ipt.pt/joclad2021/>

- B64.** Loide, A., Quintino, H., **Infante, P., Jacinto, G.** Statistical Modeling of User Influx to the HESE's Emergency Services. Poster - XXVIII Jornadas de Classificação e Análise de Dados (JOCLAD2021), December 9-11, 2021, Covilhã, <http://www.joclad.ipt.pt/joclad2021/>

- B65.** Carinhas, D., Alves, M, **Infante, P.**, Martinho, A., Quality Control Techniques for tidal data in near real time. Poster - XXVIII Jornadas de Classificação e Análise de Dados (JOCLAD2021), December 9-11, 2021, Covilhã, <http://www.joclad.ipt.pt/joclad2021/>

- B66.** **Alpizar-Jara, R., Henriques-Rodrigues, L.**, Ávido, N. Distributional properties of the Lincoln-Petersen-like estimators under extreme lower recapture values, XXV Congresso da Sociedade Portuguesa de Estatística, virtual, organized by Évora University with CIMA support, October 13-16, 2021, <http://www.spe2021.uevora.pt>

- B67.** Ana Galantinho, Sofia Eufrazio, Carmo Silva, Filipe Carvalho, **Russell Alpizar-Jara**, António Mira. Road effects on demographic traits of small mammal populations: a capture-recapture study. XXV Congresso da Sociedade Portuguesa de Estatística, virtual, organized by Évora University with CIMA support, October 13-16, 2021, <http://www.spe2021.uevora.pt>
- B68.** Jaime Mosquera, **Russell Alpizar-Jara**. Fitting flexible parametric detectability functions in distance sampling, XXV Congresso da Sociedade Portuguesa de Estatística, virtual, organized by Évora University with CIMA support, October 13-16, 2021, <http://www.spe2021.uevora.pt>
- B69.** **Santos, J** (presenter); **Pires, M.**; **Alpizar-Jara, R.** Approximations to the Binomial distribution, its bounds, relative and absolute precision, 23. XXV Congresso da Sociedade Portuguesa de Estatística, virtual, organized by Évora University with CIMA support, October 13-16, 2021, <http://www.spe2021.uevora.pt>.
- B70.** Joana Pimpão, Ana Galveias, **Russell Alpizar-Jara**, Ana R. Costa, Célia M. Antunes. Influence of atmospheric pollen levels on the incidence of Sars-Cov-2 virus infection. 24. XXI SPB National Congress of Biochemistry 2020 in 14-16 October 2021. <http://www.xxispbcongress2020.uevora.pt/communications/>
- B71.** Nunes J., Sterghite D., Marques M., Branco S., Martins L., Filho C, Craveiro A, **Alpizar-Jara R.**, Burke A.J., Costa A.R., Antunes C.M. Biocompatibility and biosafety analysis of chitosan hydrogels using organotypic epidermal models. 25. XXI SPB National Congress of Biochemistry 2020 in 14-16 October 2021. <http://www.xxispbcongress2020.uevora.pt/communications/>

Invited communications at national events

- B72.** **Pires, M.**, Bodnár, T. Applicability of a tensorial artificial diffusion stabilization in numerical simulations of Oldroyd-B type fluids, thematic session Some mathematical biology problems, Encontro Nacional da Sociedade Portuguesa de Matemática 2021 (ENSPM2021). <https://enspm2021.spm.pt/wp-content/uploads/thwcf/uploads/0d5e91e83c2f7d13b65604b79a3b80d2/Marilia.pdf>, <https://enspm2021.spmatematica.online/parallel-sessions-programme/#S EN1107>.
- B73.** **Ludwig Streit**, “Calculus in Infinite Dimensional Probability Spaces. From Gauss to Poisson”. ENSPM21, July 12-16, 2021, Lisbon, <https://pt.enspm2021.spm.pt/>. L. Streit: <https://enspm2021.spm.pt/wp-content/uploads/thwcf/uploads/54d6b3b4e21fde48b1beb8a90a6d465e/Abstract-LStreit.pdf>
- B74.** **Alpizar-Jara, R.**, **Henriques-Rodrigues, L.**, Ávido, N. Distributional properties of the Lincoln-Petersen estimator under extreme lower recapture values. ENSPM21: Encontro Nacional da Sociedade Portuguesa de Matemática, July 12-16, 2021, Lisbon. <https://pt.enspm2021.spm.pt/wp->

C – Reports

- C1** . M. Aleandri, S. Abrahams, A. Berryman, G. Brennan, C. Budd, **J.M.C. Correia**, E. Donlon, S. Kamperis, D. Mckinnell, B. Metherrall, F. Millward, J. Roberts, K. Yu, F. Zeng, Encouraging Safe, Green, and Economically Sustainable Use of our Natural Environment, Natural Resources Wales, ESGI 165, Durham University, Mathematics in Industry Reports (MIIR), 19 pp.
- C2** **Cabral, J.**, Melo, H., Martins, M., Medeiros, P., “Relatório de Avaliação Externa – Plano Integrado de Promoção do Sucesso Escolar – ProSucesso, Açores pela Educação”, Universidade dos Açores, outubro 2021, 91 páginas.
- C3** **João A. Sousa** is co-author of the M36 Report of the EURAMET 17NRM05-EMUE project. “Good practice in evaluating measurement uncertainty. Compendium of examples”. Adriaan M. H. van der Veen and Maurice Cox (editors). 1st edition, July 27, 2021.
http://empir.npl.co.uk/emue/wp-content/uploads/sites/49/2021/07/Compendium_M36.pdf
- C4** Lopes, M., Adivinha, A., **Afonso, A.**, Frias, A., Fonseca, C., Cruz, D., Mendes, F., Serra, I., Pinho, L., Ferrinho, R. (2021). Relatório: Estudo de intervenção complexa. As respostas sociais no percurso de Cuidados à Pessoa com Dependência. Universidade de Évora, Comprehensive Health Research Centre e Confederação Nacional das Instituições de Solidariedade. Relatório realizado para a CNIS – Confederação Nacional das Instituições de Solidariedade, no âmbito do projeto de investigação Projeto de Intervenção Complexa: as Respostas Sociais no Percurso de Cuidados à Pessoa com Dependência, POISE-03-4639-FSE-000286, 100 pp
<http://rotass.cnis.pt/wp-content/uploads/2021/05/Relatorio-Estudo-de-Intervencao-Complexa-As-Respostas-Sociais-....pdf>
- C5** Mafalda Rangel (coordination), Pedro Veiga, **Gonçalo Jacinto**, João Pontes, Hugo Diogo, Luís Bentes, Pedro Monteiro, Ana Guerreiro, Daniela Pio Quinto, Frederico Oliveira, Gonçalo Araújo, Hugo Pais, Inês Dias, Inês Sousa, Inga Silva, Manuela Oliveira, Pablo Pita, Rui Coelho, Sara Carvalho, Sebastián Villasante, Jorge MS Gonçalves, Karim Erzini. 2021. Pilot Study 1.1: Data collection on Recreational Fisheries: PESCADATA (PS1-PT- 2021_Report). General Directorate of Natural Resources, Safety and Maritime Services (**DGRM**). Centre of Marine Sciences (**CCMAR**), University of Algarve, Faro, Portugal **34p** + Annex
- C6** Cláudio Pinheiro Bicho, **Russell Alpizar-Jara**, António Pedro Santos. Relatório de progresso apresentado à Safari Club International (SCI)- Lusitânia Chapter e ao Instituto de Conservação da Natureza e das Florestas (ICNF). Bases Técnico-Científicas para a Elaboração de um Plano Global de Gestão (PGG) de cervídeos

D – Organization of conferences and seminars

International Meetings

- D1. V.Bushenkov**, The International Conference "Dynamic Control and Optimization (DCO21)". Aveiro, February 3 to 5, 2021, Aveiro.
- Scientific Committee member.
<https://sites.google.com/view/dco2021/organization>
- D2. V.Bushenkov**, XII International Conference Optimization and Applications (OPTIMA-2021), Petrovac, Montenegro on September 27 - October 1, 2021. - Program Committee member. <http://agora.guru.ru/display.php?conf=OPTIMA-2021>
- D3. J. Correia**. CIMPA Research School 2021 "Mathematical Modelling for Ecosystems"(Centre International de Mathématiques Pures et Appliquées), Caraga State University, Butuan City, Philippines (postponed August 22 – September 02, 2022), Coordinator and Scientific Committee.
- D4. R. de Sousa**. The Cape Verde International Days on Mathematics 2021 Praia, Cape Verde, September 6-10, 2021 (<https://sites.google.com/view/cvim2021/registration-and-deadlines>), member of the Local Organizing Committee.
- D5. Marco Garapa**, The 30th International Joint Conference on Artificial Intelligence (IJCAI-21). Montreal- Canada, August 19-26, 2021.<https://ijcai-21.org/>. Program Committee member.
- D6. Marco Garapa**, 18th International Conference on Principles of Knowledge Representation and Reasoning (KR2021). *Hanoi Vietman (Online)*. November 3-12, 2021. <https://kr2021.kbsg.rwth-aachen.de/>. Program Committee member
- D7. Maurício Reis**, 35th AAAI Conference on Artificial Intelligence (AAAI-21), A Virtual Conference, February 2–9, 2021, <https://aaai.org/Conferences/AAAI-21/>, Program Committee member;
- D8. Maurício Reis**, 30th International Joint Conference on Artificial Intelligence (IJCAI-21), Montreal-themed Virtual Reality, August 19-26, 2021, <https://ijcai-21.org/>, Program Committee member;
- D9. Maurício Reis** , 20th EPIA Conference on Artificial Intelligence (EPIA 2021), Online, September 7-9, 2021, <http://www.appia.pt/epia2021/>, Member of the Program

Committee of the Knowledge Representation and Reasoning (KRR) Thematic Track (<http://www.appia.pt/epia2021/krr>);

- D10. Maurício Reis,** 3rd Workshop on Proof Theory and its Applications, Funchal, Madeira, December 2-4, 2021, <https://kgs.logic.at/madeira2021/workshop>, Organizing Committee member;
- D11. Maurício Reis,** 3rd International Winter School on Proof Theory, Funchal, Madeira, November 29 - December 1, 2021, <https://kgs.logic.at/madeira2021/winter-school>, Organizing Committee member.
- D12. Carlos A. Braumann.** DSABNS 2021 - Virtual, 12th international Conference on Dynamical Systems Applied to Biology and Natural Sciences DSABNS 2021, 2-5 February 2021, virtual, hosted by the Basque Centre for Applied Mathematics, Bilbao, Spain, <https://wp.bcamath.org/dsabns21/>. Member of the International Organizing Committee: https://wp.bcamath.org/dsabns21/?page_id=13
- D13. Carlos A. Braumann.** DSABNS 2022 - Virtual, 13th International Conference on Dynamical Systems Applied to Biology and Natural Sciences (DSABNS 2022), hosted by the Basque Centre for Applied Mathematics, Bilbao, Spain, 8-11 February 2022, <https://sites.google.com/view/dsabns2022/>. Member of the International Organizing Committee: <https://sites.google.com/view/dsabns2022/organizing-committee>
- D14. Carlos A. Braumann.** 4º Encontro de Biomatemática (4 EncBioMat), CEFET-RJ, 26-29 April 2022, Rio de Janeiro, Brasil, <https://encbiomat.wixsite.com/encbiomat>. Scientific Committee member: <https://encbiomat.wixsite.com/encbiomat/comissoes>
- D15. João A. Sousa,** Policy and Science debate on Green Deal. IPQ and EURAMET joint organization, May 5, 2021. <https://www.euramet.org/invitation-5-may-ipq-and-euramet-policy-debates/>
- D16. João A. Sousa,** World Metrology Day, IPQ, May 20, 2021. <https://www.worldmetrologyday.org/events.html#IPQ>
- D17. Dulce Gomes,** Member of the Organizing Committee of XXV Congresso da Sociedade Portuguesa de Estatística, Universidade de Évora, October 13-16, 2021. <http://www.spe2021.uevora.pt>
- D18. Dulce Gomes,** Member of the Organizing of the Joint Seminar CIMA/DMAT/PDM, October 6-January 26, 2021. <https://www.dmat.uevora.pt/informacoes/seminarios>
- D19. Infante, P., Afonso, A.,** Membros da Comissão Científica, XXVIII Jornadas da Associação de Classificação e Análise de Dados (JOCLAD), Universidade da Beira Interior, 9 a 11 de Dezembro de 2021, Covilhã, Portugal. <http://www.joclad.ipt.pt/joclad2021/pt/joclad2021/organizacao>

- D20.** **Infante, P., Afonso, A., Jacinto, G.** Membros da Comissão Organizadora do Seminário Segurança Rodoviária, Universidade Évora, 6 de Outubro de 2021, Évora, Portugal. <https://moprevis.uevora.pt/>
- D21.** **Patrícia A. Filipe**, Member of the Organizing Committee of XXV Congresso da Sociedade Portuguesa de Estatística, Universidade de Évora, October 13-16, 2021. <http://www.spe2021.uevora.pt>
- D22.** **Russell Alpizar-Jara**, President of the Organizing Committee of XXV Congresso da Sociedade Portuguesa de Estatística, Universidade de Évora, October 13-16, 2021. <http://www.spe2021.uevora.pt>
- D23.** **Russell Alpizar-Jara**, Member of the Organizing Committee of the 1st International Conference on SOCIETY, HEALTH AND ECONOMICS (SHE). Effect of vector-borne diseases (May 17th to May 19th 2021). Parque Tecnológico de Fuerteventura, Canary Island, Spain. (<https://she.afrimac.org/aboutUs/>)
- D24.** **Russell Alpizar-Jara**, Member of the Organizing Committee of the Workshop NAQUIBIODPSA: Obtenção de Medicamentos Veterinários a partir de Nanopartículas Prata fixadas em Bases Poliméricas de Hidrogéis de Quitosana. Universidade de Évora/BRINOVA Junho 15, 2021. [https://www.uevora.pt/ue-media/agenda/\(item\)/22555?item=32550](https://www.uevora.pt/ue-media/agenda/(item)/22555?item=32550)
- D25.** **Russell Alpizar-Jara**, Member of the Organizing Committee of IMAAC (COST Action CA16227)- Programme of the Hybrid Special Meeting. Working Group Meeting, “Hybrid Special Meeting, WG1 and WG2 (23. – 24. September 2021)”, Locally organized by Quantec GmbH and in collaboration by members of University of Évora. Venue : SANA Metropolitan Hotel (<https://imaac.eu>)
- D26.** **Pereira, D. G.**, The 50th International Biometrical Colloquium, Szamotuły (Poland), September 6-8, 2021, URL: <https://www1.up.poznan.pl/cb50/l-miedzynarodowe-colloquium-biometryczne/>. Scientific Committee member: <https://www1.up.poznan.pl/cb50/komitet-naukowy/>
- D27.** **José Rodrigues**, 14th Virtual Congress WCCM & ECCOMAS 2020, organized in virtual format from January 11th to 15th , 2021, MS407 - Patient specific biomechanics modeling and simulation

National Meetings

- D28.** **J. Correia**. “Some mathematical biology problems”, Parallel Session (online) of ENSPM 2021 (Encontro Nacional Sociedade Portuguesa de Matemática 2021), SPM, Portugal, Organizer.
- D29.** **Pires, M.**, Mammeri ,Y. Thematic session Conservative PDE's and applications. Encontro Nacional da Sociedade Portuguesa de Matemática 2021 (ENSPM2021), online (July 12 - 16, 2021). <https://enspm2021.spm.pt/parallel-sessions-programme/>

- D30. Pedro Marques**, Member of the organising committee of the Workshop "Construindo Aprendizagem na Universidade", University of Évora, 7th April 2021
- D31. C. Grácio, S. Fernandes, L. Bandeira**, 2021 Mini-Symposia: "Discrete Dynamical Systems", Universidade de Évora (online), 25/3/2021, http://www.symcomp2021.uevora.pt/minisymposium_SF2.pdf ,
- D32. J. Rodrigues**, SYMCOMP 2021 5th International Conference on Numerical and Symbolic Computation Developments and Applications, Évora, Portugal, 25-26 March 2021

E – Advanced training

PhD Thesis (Concluded)

- E1** Rui Manuel Silva Carapinha, Nonlinear and Functional Higher Order Impulsive Problems, under the PhD Program in Mathematics at the University of Évora, **Feliz Minhós** Adviser.
- E2** Infeliz Carvalho Coxe, "Lower and upper solutions method on higher order boundary value problems including differential equations and coupled systems", PhD Program in Mathematics, University of Évora, Adviser: **Feliz Minhós**.

Master Thesis (Concluded)

- E3** Anilzabel Ramos, One-dimensional Models for Newtonian and Generalized Newtonian Fluids, Mestrado em Matemática Aplicada da Universidade de Évora, Adviser: **Fernando Carapau**.
- E4** Atanásio Barros Rodrigues Bandeira, "Sistemas de equações diferenciais não lineares de 1ª ordem e aplicações" University of Évora, Adviser: **Feliz Minhós**.
- E5** Vicente Maria Martins Bértolo Marques, *Comando Avançado do Movimento de Cargas Suspensas*, Advisers: Carlos Neves e **Diogo Baptista**
- E6** Susana Maria Pereira da Silva, Análise de Sobrevivência Aplicada à Educação, Adviser:: **Ana Maria Abreu**
- E7** Pedro Daniel Ponte Camacho, Representações Gráficas em Análise de Sobrevivência, Adviser:: **Ana Maria Abreu**

- E8** Fernando Moreno, Estudo comparativo de métodos de análise e previsão de séries temporais: métodos estatísticos versus redes neuronais, Adviser:: **Dulce Gomes**
- E9** Taymara Rodrigues, Mortalidade por Causas Relacionadas à AIDS em Amazônidas e seus Determinantes Sociais: Análise Espacial e Temporal (Mestrado em Enfermagem em Saúde Pública. Instituto de Ciências da Saúde da Universidade Federal do Pará, Brasil.), Advisers: Eliã Botelho e **Dulce Gomes**
- E10** João Paulo Alter, Volatility Forecast for the Brazilian Stock Market (Bovespa Index), Advisers: **Anabela Afonso**, Manuel Minhoto, Vitor Manuel Ferreira Moutinho
- E11** Ana Paula Ferrari Januário, Análise estatística da produção de vitelão Mertolengo, Advisers: **Patrícia A. Filipe** and **Gonçalo Jacinto**
- E12** Gonçalo Rosner Fragoso, Implementação e resultados obtidos de um modelo BI em restauração de luxo, Adviser: **Manuel do Carmo**
- E13** Ricardo José Bastos Teles Batista, Mercado Segurador
Adviser: **Manuela Larguinho**
- E14** Miguel Filipe Dinis Ferreira, Atividade Comercial na Banca
Adviser:: **Manuela Larguinho**
- E15** Bárbara Cardoso Ferreira, Liderança Virtual em Gestão de Projetos
Advisers: Paulo Moreira and **Manuela Larguinho**

Curricular and Scientific Internships

- E16** Miguel de Melo Tomás de Sousa Moreira, Movement of Suspended Loads: Dynamic Systems and Control Theory – MOSUL – Advisers: Carlos Neves e Diogo Baptista (Refª.FR026-Mosul.1/2021)
- E17** Bhaswar Chakma, bolsheiro do Projecto POCI-01-0145-FEDER-031346 ``Urban TB: Dos sintomas ao Diagnóstico de Tuberculose em Contexto Urbano, considerando fatores individuais e Contextuais. Quais são os Pontos Críticos desta demora". (PI Carla Nunes, Escola Nacional de Saúde Pública da Universidade Nova de Lisboa). Advisers: **Dulce Gomes**, **Patrícia A. Filipe**
- E18** Nilton Osvaldo Benvindo Ávido. Sampling elusive populations: methods and applications. Bolseiro no programa Estágios Científicos Avançados em Matemática - PALOP da Fundação Calouste Gulbenkian. Advisers: **Russell Alpizar-Jara**, **Lígia Henriques-Rodrigues**
- E19** Joana Rodrigues Ferreira Pimpão. Relatório de Estágio da Licenciatura de Bioquímica: Influência dos níveis de pólen atmosféricos na incidência de infeção pelo vírus Sars-Cov-2. Departamento de Química, Escola de Ciências e Tecnologia, Universidade de Évora. Advisers: Célia Maria Miguel Antunes, Ana

Cristina Bugalho Oliveira Rodrigues Costa, **Russell Alpizar-Jara**.

PhD Thesis (ongoing)

- E20** Khankham Vongsavang, *Diffusive-Dispersive Conservation Laws in Coagulation-Fragmentation*, (Advisers: **Joaquim Correia**, F.P. da Costa, Universidade Aberta, Portugal)
- E21** Bouasy Doungsavanh, *Mathematical Analysis of Structured Models of Waterborne Diseases: Application to Laos*, (Adviser **Joaquim Correia**, Y. Mammeri, Université de Picardie Jules Verne, France)
- E22** G. Maypaokha, *The Effect of Saturating Diffusion on Hyperbolic Partial Differential Equations*, (Adviser **Joaquim Correia**, N. Bedjaoui, Université de Picardie Jules Verne, France).
- E23** João Horta, Universidade de Cabo Verde, Propriedades algébricas dos números externos, Universidade de Évora, Supervisor **Imme van den Berg**
- E24** Imad Berrabah, Slow-fast fields with external numbers, Université de M'Sila, Argelia, supervisor Abdelmadjid Boudaoud, co-supervisor **Imme van den Berg**,
- E25** Manuel António Caldas Faria, Dense, positioned and almost-positioned numerical semigroups, Doutoramento em Matemática da FCT- Universidade Nova de Lisboa, Advisers: **Manuel Branco** and José C. Rosales González
- E26** Márcio André Traesel, Estudo de algumas variedades do número de Frobenius, Doutoramento em Matemática da Universidade de Évora, Advisers: **Manuel Branco** and José C. Rosales González
- E27** Maria Isabel de Magalhães Colaço, Betti numbers of some semigroup rings, Doutoramento em Matemática da Universidade de Évora, **Advisers: Manuel Branco** and Ignácio Ojeda
- E28** Nada El Bouziani, Doutoramento em Mecatrónica. Universidade de Évora. 2021-2022 (Advisers: **C. Ramos**, M. Tlençani)
- E29** Jerome B. Bedong, A Biorthogonal Approach to Fractional Poisson Analysis, Advisers: **José L. da Silva** and Sheila Menchavez
- E30** Ivo Miguel Sousa Ferreira, Modelos de Sobrevivência Paramétricos para Acontecimentos Múltiplos. Advisers: Cristina Maria Tristão Simões Rocha e **Ana**

Maria Abreu

- E31** Jaime Jerónimo, Análise de sobrevivência de mulheres diagnosticadas com cancro de mama em Angola no período de 2013 a 2017, Advisers: **Patrícia A. Filipe** and **Dulce Gomes**
- E32** Manuel Alberto, Sinistralidade rodoviária em Angola: uma análise em Séries Temporais. Advisers: **Dulce Gomes** and **Patrícia A. Filipe**
- E33** Thais Zamboni Berra, Impacto da Introdução de Teste Molecular Rápido GeneXpert® na Redução da Tuberculose em uma Cidade Endêmica do Sudeste do Brasil. (Doutoramento de Enfermagem em Saúde Pública. Escola de Enfermagem de Ribeirão Preto da Universidade de São Paulo, Brasil)
Advisers: Ricardo A. Arcêncio and **Dulce Gomes**
- E34** Luana Sales, Impacto de comorbidades diabetes *mellitus* e COVID-19 na Tuberculose no estado de São Paulo (Doutoramento de Enfermagem em Saúde Pública. Escola de Enfermagem de Ribeirão Preto da Universidade de São Paulo, Brasil), Advisers: Ricardo A. Arcêncio and **Dulce Gomes**
- E35** Armando Alexandre Coholina, Estimadores Otimais em Modelos Bi-aditivos e suas Famílias, Universidade de Évora with the thesis , Adviser: **Oliveira, M.**
- E36** Maria João Inácio, Cartas de Controlo: Monitorização de Perfis e Risco Ajustado, Doutoramento em Matemática, Universidade de Évora. Advisers: **Infante. P.**, Figueiredo, F. O.
- E37** Dora Carinhas, Modelação Estatística das Marés, Doutoramento em Matemática, Universidade de Évora. Advisers: **Infante, P.**, Martinho, A.
- E38** Cláudia Pereira, Novas Abordagens a Modelos de mistura em Análise de Sobrevivência, Doutoramento em Matemática, Universidade de Évora. Advisers: **Infante. P.**, Mendonça, S.
- E39** Nelson Jamba, Modelos mistos de crescimento individual em ambiente aleatório, Advisers: **Patrícia A. Filipe** and **Gonçalo Jacinto**
- E40** Mahdi Rahimi Pordanjani, A Comparative Study of Impacts and Implications of Climate Change on Tourism in Portugal and Iran, Doutoramento em Turismo, Faculdade de Economia da Universidade do Algarve, Advisers: **Manuel do Carmo** and **Antónia Correia**
- E41** Ana Galantinho, As estradas são refúgios ou barreiras para os micromamíferos? Implicações para a gestão das bermas de estrada, Doutoramento em Biologia, Universidade de Évora, Advisers: António Paulo Pereira Mira, [Russell Alpizar-Jara](#)

Master Thesis (ongoing)

- E42** Eduardo Eloy, Modelos e Métodos para Modelação de Gestão Florestal / Models and Methods for the Modelling of Forest Managing. Adviser: **V. Bushenkov**.
- E43** JED CLARKE – “A Review of Vietnamese Citizen’s Current Financial Literacy from a Consumer Perspective”, Hanoi, 2021. Adviser: **J. Fialho**.
- E44** NGUYEN Dieu Hang - “The Main Factors That Make Vietnamese Local Supplier Empower Buying Intention In Vietnam In Next 10 Years”, Hanoi, 2021. Adviser: **J. Fialho**.
- E45** NGUYEN NGOC HOA – “MBA Student's Segmentation Characteristics, Motivational Factors to Study and Influential Factors for Choosing a School: The case of British University Vietnam”, Hanoi, 2021. Adviser: **J. Fialho**.
- E46** Ana Isabel Semedo de Carvalho, Etnomatemática: Saberes Matemáticos na Agricultura de Exploração Familiar na Comunidade de Pico d’Antónia. Adviser: **R. de Sousa**.
- E47** Filipe Miguel Ferreira Santos Duarte, Controlo da Movimentação de Cargas Suspensas usando Controlo Preditivo, Adviser: **Diogo Baptista**
- E48** Vânia Domingas de Sousa Figueira, Métodos geradores de distribuições de probabilidade, Adviser: **Ana Maria Abreu**
- E49** Loide Ascenso. Modelação Estatística da Afluência ao Serviço de Urgência do HESE. Mestrado em Modelação Estatística e Análise de Dados, Universidade de Évora. Advisers: **Jacinto, G., Infante, P.**
- E50** Miguel Costa Lima Lobo. Deep Learning and AI-based algorithms: Redesign supermarket layout and product recommendation model through user behavior analytics and people/object identification. Mestrado em Business Analytics. Iscte-Instituto Universitário de Lisboa. Adviser: **Patrícia A. Filipe**
- E51** João Miguel Grácio Alves. Big Data Analytics in Water Supply Network Management. Mestrado em Business Analytics. Iscte-Instituto Universitário de Lisboa. Adviser: **Patrícia A. Filipe**
- E52** João Pedro Pina Nunes. Estudos do comportamento de hidrogéis de quitosano para aplicações veterinárias em linhas celulares. Curso de Mestrado em Bioquímica. Universidade de Évora. Advisers: Ana Rodrigues Costa, Anthony Joseph Burke, **Russell Alpizar-Jara**
- E53** Cláudio Filipe Pinheiro Bicho. Bases técnico-científicas para a elaboração de um Plano Global de Gestão (PGG) para a Serra do Mendro. Curso de Gestão

F Computational applications

G1 Daniel Camacho and **Ana Abreu** (2021). vsd: Graphical Shim for Visual

Survival Data Analysis. R package version 0.1.0.

<https://CRAN.R-project.org/package=vsd>

G – Invited talks and seminars

G1 Correia, J.M.C., Lecture (online) “Examples of Discretization of Partial Differential Equations”, SEAMS (South East Asia Mathematical Society) 2020 School Modern Tools for Mathematical Modeling of Ecosystems, Caraga State University, 23rd August – 3rd September, 2021, Butuan City, Philippines.
(<https://sites.google.com/view/seamsph2020/home>)

G2 Correia, J.M.C., Séminaire d'analyse appliquée A3 “Population balance, coagulation-fragmentation et l'approximation de lois de conservation hyperboliques”, 11 octobre 2021, LAMFA CNRS UMR 7352, Amiens, France.
(<http://www.lamfa.u-picardie.fr/seminaires-colloques/article/seminaire-d-analyse-appliquee-a%C2%B3?lang=fr>)

G3 Pires, M., Bodnár, T. Numerical Simulations of Vanishing Diffusion Stabilization for Oldroyd-B fluid flows. Seminar of applied analysis of Amiens. LAMFA, UMR CNRS 7352, Picardie Jules Verne University, France.
<https://www.lamfa.u-picardie.fr/seminaires-colloques/article/seminaire-d-analyse-appliquee-a%C2%B3?lang=fr>

G4 Diogo Batista, Mathematical Modelling, Agrupamento de Escolas de Pombal, 19 de maio de 2021

G5 Diogo Batista, Discovering Mathematics in various professions, Agrupamento de Escolas de Pombal, 17 de maio de 2021

G6 Diogo Batista, Discovering Mathematics in various professions,, Agrupamento de Escolas de Pombal, 18 de junho de 2021

G7 Diogo Batista, Robots at the Library, Biblioteca da EB1 da Gândara dos Olivais – 04/05/2021 – Duas sessões para duas turmas do 3.º ano

G8 Oliveira, M. 2021. 1º Workshop Modelação Estatística dos sistemas florestais. Análise Estatística de incêndios florestais. 25 e 26 de Março, 2021.

G9 Infante, P., Jacinto, G, Afonso, A., Rego, L., Nogueira, P., Silva, M., Nogueira, V., Saias, J., Quaresma, P., Santos, D., Gois, P., Manuel, P. R., MOPREVIS: Importância para a Segurança Rodoviária, Webinar realizado no âmbito das comemorações dos 109 anos do Comando Territorial da GNR de Setúbal, 5 de Maio de 2021, Live Streaming.

G10 Infante, P., Jacinto, G, Afonso, A., Rego, L., Nogueira, P., Silva, M., Nogueira, V., Saias, J., Quaresma, P., Santos, D., Gois, P., Manuel, P. R., A sinistralidade rodoviária no distrito de Setúbal: caracterização, explicação e caminhos para a predição, Seminário Segurança Rodoviária, 6 de Outubro de 2021, Évora.

G11 L. Streit: “What is Stochastic Analysis and what is it good for” Webinar, Mindanao State University – Iligan Institute of Technology, Dept. of Mathematics, The Philippines, February 24, 2021.

G12 José L. da Silva. Green Measures for (Time Changed) Markov Processes, Webinar, Apr. 2, 2021, https://www.math.ttu.edu/~dvolchen/images/demo/jluis_Yuri-senimar_2021_v1.pdf

H. Projects and scientific contracts

FCT Projects

H1 BIOECOSYS - LISBOA-01-0145-FEDER-030391 - PTDC/ASP-SIL/30391/2017 Forest ecosystem management decision making methods: an integrated bioeconomic approach to sustainability. J.G. Borges (ISA, Lisboa) - PI, **V. Bushenkov** - project coordinator in Évora: <https://pt.bioecosys.com>

H2 MODFIRE - PCIF/MOS/0217/2017, A multiple criteria approach to integrate wildfire behavior in forest management planning. S. Marques (ISA) - PI. **V. Bushenkov** - project coordinator in Évora: <https://www.modfire.net/>

H3 Project PTDC/CCI-COM/30990/2017, “Revisão de Crenças aplicada a Terapias de Neuroreabilitação”/”Belief Revision applied to Neurorehabilitation Therapy”. Execution Period: from 01-10-2018 to 30-09-2021. Principal Investigator: Prof. Dr. Eduardo Fermé.

- H4** Project PTDC/CCI-COM/4464/2020, “Dinâmica de Perfis baseada em Conhecimento”/“Knowledge-Driven Profile Dynamics”. Execution Period: from 29-03-2021 to 28-03-2024. Principal Investigator: Prof. Dr. Eduardo Fermé.
- H5** ALT20-03-0247-FEDER-017659, BRO-CQ, Controlo de Qualidade de Blocos em Rochas Ornamentais, de 01-10-2016 a 30-09-2019, prorrogado até 30-11-2021, investigador principal (UE) Mouhaydine Tlemçani, <https://www.uevora.pt/investigar/projetos?id=3601>, membro do projeto C. Correia Ramos, Luis Bandeira.
- H6** PRES21006 - Avaliação do projeto ProSucesso. SID/CND/2021/007 - SID/CND/FGF - 9-4-2021 - APAE21 - João Manuel Gonçalves Cabral REIT-INT/2021/2712 .Contract for the provision of services, with the Regional Government of the Autonomous Region of the Azores, for the Evaluation of Projects in Education for 2015-2020, included in the ProSucesso project. Principal Investigator: João Manuel Gonçalves Cabral, who received funding of 2736 euros from the total cost of 11664 euros. Project duration May 2021 to October 2021
- H7 Dulce Gomes and Patrícia A. Filipe.** Project PTDC/SAU-PUB/31346/2017 “Urban TB: Dos sintomas ao Diagnóstico de Tuberculose em Contexto Urbano, considerando fatores individuais e Contextuais. Quais são os Pontos Críticos desta demora”. June 2018 to September 2022. PI Carla Nunes, Escola Nacional de Saúde Pública da Universidade Nova de Lisboa.
- H8** Project ref. H2020-MSCA-RISE-2020 / 101007950, with the title “DecisionES – Decision Support for the Supply of Ecosystem Services under Global Change”, funded by the Marie Curie International Staff Exchange Scheme. Coordination: Forest Technology Centre of Catalonia (Spain). Other institutions involved: Universidade de Lisboa (ISA), Portugal; Swedish University of Agricultural Science, Sweden; Technical University of Madrid, Spain; University of Freiburg, Germany; Pennsylvania State University, University of Washington, USAD Forest Service, USA; University of Eastern Finland, Finland; University of Chile and Catholic University of Chile, Chile; University of S. Paulo, Brazil, Centro Agronomico Tropical de Investigacion y Ensenanza CATIE, Costa Rica; University of Laval, University of Quebec in Montreal, Canada. (2021-2025).
- H9** Project “Forest ecosystem management decision-making methods - an integrated bio -economic approach to sustainability”(BIOECOSYS), funded by Fundos Europeus Estruturais e de Investimento (FEEI). (COMPETE, PORNorte, PORCentro, PORLisboa e PORAlentejo). Coordination: Instituto Superior de Agronomia (ISA). Other institutions involved: Universidade de Évora, Universidade Católica Portuguesa, Instituto Politécnico de Leiria and Faculdade de Ciências from Universidade de Lisboa. (2018-2021).

H10 SNS24.Scout.AI - Aplicação de Metodologias de Inteligência Artificial e Processamento de Linguagem Natural no Serviço de Triagem, Aconselhamento e Encaminhamento do SNS 24. DSAIPA/AI/0040/2019. Participantes: Universidade de Évora (líder) e Serviços Partilhados do Ministério da Saúde, E.P.E. (SPMS). 2020/21. PI: Quaresma, P.. CIMA members: **Infante, P., Afonso, A., Jacinto, G.**

H11 MOPREVIS - Modelação e predição de acidentes de viação no distrito de Setúbal. Membro da equipa de investigação.DSAIPA/DS/0090/2018. Participantes: Universidade de Évora (líder) e Guarda Nacional Republicana (Comando Territorial de Setúbal). 2019/21. PI. **Infante. P.** Other CIMA members: **Afonso, A., Jacinto, G.**

International projects

H12 **J. Alves e Sousa**, Project EMPIR 17NRM05 – Advancing measurement uncertainty – comprehensive examples for key international standards. (<http://empir.npl.co.uk/emue/>). Coordinator: Prof. Maurice Cox of the National Physical Laboratory, United Kingdom. Concluded in July 2021

H13 **J. Alves e Sousa**, Project EMPIR 17IND12 – Metrology for the Factory of the Future. (<https://www.ptb.de/empir2018/met4fof/home/>). Coordinator: Dr. Sascha Eichstaedt of the Physikalisch-Technische Bundesanstalt, Germany. Concluded in December 2021

H14 **J. Alves e Sousa**, Project EMPIR 18NET05 – Support for a European Metrology Network for Mathematics and Statistics (<https://www.ptb.de/empir2018/met4fof/home/>). Coordinator: Dr. Markus Baer of the Physikalisch-Technische Bundesanstalt, Alemanha. Ongoing (to be concluded in 2023)

H15 **J. Alves e Sousa** Project EMPIR 19NRM02 – revision and extension of standards for test methods for LED lamps, luminaires and modules (<https://www.ptb.de/empir2020/revstdled/project/overview/>). Coordinator: Dr. Armin Sperling of the Physikalisch-Technische Bundesanstalt, Alemanha. Ongoing (to be concluded in 2023)

H16 **J. Alves e Sousa** Project EMPIR 20NET01 – Support for a European Metrology Network for Clean Energy. Coordinator: Dr. Fabian Plag of the Physikalisch-Technische Bundesanstalt, Alemanha. Budget: 500,000 €. Ongoing (to be concluded in 2024)

H17 **Joaquim Amândio Azevedo**, VIMETRI MAC / 3.5b / 065, 2017 to 2021, “Sistema de Vigilancia Meteorológica para el Seguimiento de Riesgos Medioambientales”, University of Gran Canaria (project leader); University of Madeira (Joaquim Amândio Azevedo, Dionísio Barros, Leonel Nóbrega).

H18 Dulce Gomes, Project ``Coorte Qualiaids-BR: Efeitos da organização do serviço de tratamento no alcance e manutenção da supressão viral do HIV e na cura da coinfeção com tuberculose na coorte de pacientes do Sistema Único de Saúde (SUS) que iniciaram tratamento antirretroviral de 2015 a 2018". 2019-2022. Supported by Organização Pan-americana de Saúde por intermédio do Ministério da Saúde do Brasil. PI: Maria Ines Battistella Nemes, Faculdade de Medicina da Universidade de São Paulo.

H19 Dulce Gomes, Project ``Os determinantes da tuberculose multidroga-resistente no estado de São Paulo: um estudo misto sobre tuberculose multidroga-resistente e seus determinantes" (Process 304483/2018-4). 01/03/2019 to 28/02/2023. PI: Ricardo Alexandre Arcêncio, Escola de Enfermagem de Ribeirão Preto, Universidade de São Paulo (Brasil). Supported by Conselho Nacional de Desenvolvimento Científico e Tecnológico.

H20 Dulce Gomes, Projeto FAPESP ``Estudo misto dos determinantes da tuberculose multidroga-resistente no estado de São Paulo: Da abordagem bayesiana à percepção dos profissionais de saúde e pacientes" (Processo 2018/14337-0). 01/06/2019 to 31/05/2021. PI: Ricardo Alexandre Arcêncio, Escola de Enfermagem de Ribeirão Preto, Universidade de São Paulo (Brasil). Supported by Fundação de Amparo à Pesquisa do Estado de São Paulo.

H21 Gonçalo Jacinto (coordinator), **Patrícia A. Filipe** (consultant), **Carlos A. Braumann** (consultant), PDR2020-1.0.1-FEADER-031128 (PDR2020-101-031130), GoBov+, Productivity improvement in the system of bovine raising for meat, 2017-21, PI: Nuno Carolino (INIAV). Action E – Growth models. <http://www.bovmais.pt>, https://www.investigar.uevora.pt/investigacao/projetos/projetos_em_curso/id/3677

H22 Russell Alpizar-Jara, team member of Technology Transfer Innovation Skills in Latin America Comissão Europeia (<https://www.uevora.pt/investigar/projetos?id=4457>)

Bilateral Projects

H23 Joaquim Correia, PICS 2018 n.o 8262 (UÉvora Projeto n.o 4126), French-Portuguese Project CNRS/FCT Diffusive-Dispersive Limit of Hyperbolic Conservation Laws, 2019–2021

H24 Russell Alpizar-Jara, Collaboration Agreement between Instituto Tecnológico de Costa Rica Campus Tecnológico San Carlos and Universidade de Évora <https://www.uevora.pt/innovar/cooperacao/cooperacao-internacional>

Contracts with Industry

- H25 Russell Alpizar-Jara is team member of the following co-promotion project industry and university collaboration:** Obtenção de Medicamentos Veterinários a partir de Nanopartículas Prata fixadas em Bases Poliméricas de Hidrogéis de Quitosana Portugal 2020 (<https://www.uevora.pt/investigar/projetos?id=3963>) PI. Anthony Burke.

I. Joint Seminar CIMA/DMAT/PDM

- I19 C. Carlota**, "Existência de solução para alguns problemas de controlo ótimo não-autónomos e não-convexos", Joint Seminar of the PhD Program in Mathematics, CIMA and DMAT, University of Évora, 9th June, 2021.
- I20 Correia, J.M.C.**, Lecture (online) "Examples of Discretization of Partial Differential Equations", SEAMS (South East Asia Mathematical Society) 2020 School Modern Tools for Mathematical Modeling of Ecosystems, Caraga State University, 23rd August – 3rd September, 2021, Butuan City, Philippines. (<https://sites.google.com/view/seamsph2020/home>)
- I21 Correia, J.M.C.**, Séminaire d'analyse appliquée A3 "Population balance, coagulation-fragmentation et l'approximation de lois de conservation hyperboliques", 11 octobre 2021, LAMFA CNRS UMR 7352, Amiens, France. (<http://www.lamfa.u-picardie.fr/seminaires-colloques/article/seminaire-d-analyse-appliquee-a%C2%B3?lang=fr>)
- I22 F. Minhós**, "Comportamento assintótico de soluções de problemas com valores na fronteira" Joint Seminar of the PhD Program in Mathematics, CIMA and DMAT, University of Évora, 20th January, 2021.
- I23 F. Pereira**, "Condições geométricas para a existência e unicidade de projeção" Joint Seminar of the PhD Program in Mathematics, CIMA and DMAT, University of Évora, 6th December, 2021.
- I24 Pires, M.**, Bodnár, T. Numerical Simulations of Vanishing Diffusion Stabilization for Oldroyd-B fluid flows. Seminar of applied analysis of Amiens. LAMFA, UMR CNRS 7352, Picardie Jules Verne University, France. (<https://www.lamfa.u-picardie.fr/seminaires-colloques/article/seminaire-d-analyse-appliquee-a%C2%B3?lang=fr>)

I25 R. de Sousa and F. Minhós, Solvability of second order coupled systems on the half-line, October 20, 2021, Seminários CIMA, Universidade de Évora, Portugal.

I26 R. de Sousa and F. Minhós, Solvability of second order coupled systems on the half-line, October 20, 2021, Seminários CIMA, Universidade de Évora, Portugal.

I27 Pedro Marques, Tipo de Jordan de álgebras artinianas, University of Évora, 12th May 2021.

I28 Manuel Branco, Dense numerical semigroups. University of Évora, 19th May 2021.

I29 Imme van den Berg, Gaussian elimination for linear systems with imprecisions, Seminário CIMA/PDM Universidade de Évora, 13-10-2021,
[Departamento de Matemática / Informações / Seminários \(uevora.pt\)](http://www.dmat.uevora.pt/informacoes/seminarios/uevora.pt)

I30 Diogo Batista, Complexity in low dimensional dynamic systems, Universidade de Évora, 21 de abril de 2021

I31 Carlos A. Braumann. Brief introduction to stochastic differential equations and applications in Biology and Finance. Stochastic differential equations: brief introduction and profit optimization in fisheries, 6 October 2021,
<https://www.dmat.uevora.pt/informacoes/seminarios/Stochasticdifferential-equations-brief-introduction-and-profit-optimization-in-fisheries>

I32 Dulce Gomes. Time Series Clustering. In Seminário conjunto CIMA/Programa de Doutoramento em Matemática, DMAT/Universidade de Évora, 15 de Dezembro, 2021. <https://www.dmat.uevora.pt/informacoes/seminarios/Time-Series-Clustering>

I33 Afonso, A. Estimação da variância em amostras complexas. Seminário conjunto CIMA/Programa de Doutoramento em Matemática, DMAT/Universidade de Évora, 27 de outubro, 2021, Évora.

I34 Russell Alpizar-Jara, Line transect sampling: basics, caveats and challenges. Seminários CIMA-DMAT e da unidade curricular de Seminário (MAT11688) do Programa de Doutoramento em Matemática, realizado (via Zoom) a 2 de junho de 2021, na Escola de Ciências e Tecnologia da Universidade de Évora, Portugal. [https://www.dmat.uevora.pt/informacoes/noticias/\(item\)/32446](https://www.dmat.uevora.pt/informacoes/noticias/(item)/32446)

III. Summary of CIMA 2021 indicators

A.1. Books	Books	4
	Chapters	2
A.2. Papers	Internationals	63
	Nationals	1
A.3. Proceedings	Internationals	6
	Nationals	5
A.4. Special Issues Edited		4
Total Publications		85
B. Comunications	Internationals	44
	Nationals	30
Total Comunications		74
C. Reports		6
D. Organization of events	Internationals	27
	Nationals	5
E. Advanced Training	PhDs	23
	Masters	25
	Others	4
F –Computational applications		1
G – Invited Seminars		12
H - Projects		25
I. Joint Seminar CIMA/DMAT/PDM		16