CMAFcIO: Scientific Report 2017

Introduction

Visitors in 2016.....45
Post-doctoral positions.....10*
Investigador FCT positions.....4**
Graduate grant positions.....1
Science managing positions.....1
PhD theses completed 1
Master theses completed 7
PhD theses in progress.....?
Conferences organized 14***
Articles published in refereed journals....100***
Invited talks by members.....49***

* Post-doctoral positions (2017):

- Differential Equations / Dynamical Systems: Paolo Gidoni; Cristina Serpa
- Biomathematics: epidemiology: Peyman Ghaffari
- Geometry and Geometric Analysis: Áurea Quintino; Daniel Ramos
- Mathematical Logic: Bruno Dinis; Ezgi Iraz Su; Emanuele Frittaion
- Partial Differential Equations: Riccardo Scala
- Geometry: Azizeh Nozad

** Nicolas Van Gothem (Nonlinear PDEs), Alexander Usvyatsov (Math. Logic), Nikolaus Stollenwerk (Biomath) and Pedro Castro (Oper. Research).

*** Details can be found in the final sections of this report. Information is also available in our webpage http://cmafcio.ciencias.ulisboa.pt

A List of Papers Published in Refereed Journals (2017)

Nonlinear PDEs and Applications

1. Almeida, Rui M. P.; **Antontsev, S. N**.; Duque, José C. M. Discrete solutions for the porous medium equation with absorption and variable exponents. *Math. Comput. Simulation* 137 (2017), 109–129.
2. Almeida, Rui M. P.; **Antontsev, S. N.**; Duque, José C. M On the finite element method for a nonlocal degenerate parabolic problem. *Comput. Math. Appl.* 73 (2017), no. 8, 1724–1740.
3. Amstutz, Samuel; **Van Goethem, N.** Incompatibility-governed elasto-plasticity for continua with dislocations. *Proc. A.* 473 (2017), no. 2199, 21 pp.
4. **Antontsev, S. N.**, Shmarev, S. I. Higher regularity of solutions of singular equations with variable nonlinearity*, Applicable Analysis* (2017), 1-22.
5. **Antontsev, S. N.**, Shmarev, S. I. The energy method. Application to PDEs of hydrodynamics with nonstandard growth. *J. Phys: Conf. Ser.* (2017), no. 894.
6. **Antontsev, S. N**.; Khompysh, Kh. Generalized Kelvin-Voigt equations with p-Laplacian and source/absorption terms. *J. Math. Anal. Appl.* 456 (2017), no. 1, 99–116.
7. **Antontsev, S. N**.; Khompysh, Kh. Kelvin-Voight equation with p-Laplacian and damping term: existence, uniqueness and blow-up. *J. Math. Anal. Appl.* 446 (2017), no. 2, 1255–1273.
8. **Antontsev, S. N**.; **Kuznetsov, I. V.** Existence of entropy measure-valued solutions for forward-backward p-parabolic equations. *Sib. Èlektron. Mat. Izv.* 14 (2017), 774–793.
9. Antunes, Pedro R. S.; **Barbarosie, C.**; **Toader, A. M.** Detection of holes in an elastic body based on eigenvalues and traces of eigenmodes. J. Comput. Phys. 333 (2017), 352–368.
10. **Baía, M.**; **Barroso, A. C.**; Matias, José; A model for phase transitions with competing terms. *Q. J. Math.* 68 (2017), no. 3, 957–1000.

11. **Barbarosie, C.**; Tortorelli, Daniel A.; Watts, Seth. On domain symmetry and its use in homogenization. *Comput. Methods Appl. Mech. Engrg.* 320 (2017), 1–45.
12. **Barroso, A. C.**; Matias, José; Morandotti, Marco; Owen, David R.; Explicit formulas for relaxed disarrangement densities arising from structured deformations. *Math. Mech. Complex Syst. 5* (2017), no. 2, 163–189.
13. **Barroso, Ana Cristina**; Matias, José; Morandotti, Marco; Owen, David R.; Second-order structured deformations: relaxation, integral representation and applications. *Arch. Ration. Mech. Anal.* 225 (2017), no. 3, 1025–1072.
14. **Barroso, Ana Cristina**; Matias, José; Santos, Pedro Miguel; Differential inclusions and A-quasiconvexity. *Mediterr. J. Math. 14* (2017), no. 3, Art. 116, 14 pp.

15. **Beirão da Veiga, H**. On the extension to slip boundary conditions of a Bae and Choe regularity criterion for the Navier-Stokes equations. The half-space case. , *J. Math. Anal. Appl*. 453 (2017), no. 1, 212-220.
16. Bonetti, Elena; Rocca, Elisabetta; **Scala, Riccardo**; Schimperna, Giulio. On the strongly damped wave equation with constraint. *Comm. Partial Differential Equations* 42 (2017), no. 7, 1042–1064.
17. **Caroccia, M**.; Cheeger *N*-clusters. *Calc. Var. Partial Differential Equations* 56 (2017), no. 2, Art. 30, 35 pp.
18. **Correia, S.**; **Figueira, M.**; Spatial plane waves for the nonlinear Schrödinger equation: local existence and stability results. *Comm. Partial Differential Equations* 42 (2017), no. 4, 519–555.
19. **de Oliveira, H. B**.; **Paiva, A**. Existence for a one-equation turbulent model with strong nonlinearities. *J. Elliptic Parabol. Equ.* 3 (2017), no. 1-2, 65–91.
20. **de Oliveira, H.B.**; **Paiva, A.** A stationary one-equation turbulent model with applications in porous media, *J. Math. Fluid Mech* (2017), 1–25.
21. **Dias, J. P.**; Oliveira, Filipe. On a quasilinear nonlocal Benney system. *J. Hyperbolic Differ. Equ.* 14 (2017), no. 1, 135–156.
22. Ferreira, Jorge; **de Oliveira, H. B.** Parabolic reaction-diffusion systems with nonlocal coupled diffusivity terms. *Discrete Contin. Dyn. Syst.* 37 (2017), no. 5, 2431–2453.
23. Negri, M.; **Scala, R**. A quasi-static evolution generated by local energy minimizers for an elastic material with a cohesive interface. *Nonlinear Anal. Real World Appl.* 38 (2017), 271–305.
24. Pistoia, A., **Tavares, H**. Spiked solutions for Schrödinger systems with Sobolev critical exponent: the cases of competitive and weakly cooperative interactions. *J. Fixed Point Theory Appl.* 19 (2017), no. 1, 407–446
25. Rocca, E., **Scala, R**. A rigorous sharp interface limit of a diffuse interface model related to tumor growth, *J. Nonlinear Sci.* 27 (2017). no. 3, 847-872.
26. **Sarrico, C. O. R**.; **Paiva, A**. Delta Shock Waves in the Shallow Water System. *Journal of Dynamics and Differential Equations* (2017), no. 3, 328–345.
27. **Sarrico, C. O. R**.; **Paiva, A**. New distributional travelling waves for the nonlinear Klein-Gordon equation. *Differential Integral Equations* 30 (2017), no. 11-12, 853–878.
28. **Sarrico, C. O. R**.; **Paiva, A**. The multiplication of distributions in the study of a Riemann problem in fluid dynamics. *J. Nonlinear Math. Phys.* 24 (2017), no. 3, 328–345.
29. **Scala, R**. A weak formulation for a rate-independent delamination evolution with inertial and viscosity effects subjected to unilateral constraint. *Interfaces Free Bound.* 19 (2017), no. 1, 79–107.
30. **Scala, R**. Limit of viscous dynamic processes in delamination as the viscosity and inertia vanish. *ESAIM Control Optim. Calc. Var.* 23 (2017), no. 2, 593–625.
31. **Scala, R.**; Schimperna, Giulio. A contact problem for viscoelastic bodies with inertial effects and unilateral boundary constraints. *European J. Appl. Math.* 28 (2017), no. 1, 91–122.
32. Soave, N., **Tavares, H.**, Terracini, S., Zilio, A. Variational Problems with Long-Range Interaction. *Arch. Ration. Mech. Anal.* 228 (2018), no. 3, 743–772.

33. **Van Goethem, N**. Front migration for the dislocation strain in single crystals. *Commun. Math. Sci.* 15 (2017), no. 7, 1843–1866.
34. **Van Goethem, N.** Incompatibility-governed singularities in linear elasticity with dislocations. *Math. Mech. Solids* 22 (2017), no. 8, 1688–1695.
35. Xavier, M., **Van Goethem, N**., Novotny, A. A., Farias, J. M. C., Fancello, E. A. Topological Derivative-Based Fracture Modelling in Brittle Materials: A Phenomenological Approach, *Engineering Fracture Mechanics* 179 (2017), 13-27.

Operations Research

1. Albareda-Sambola, Maria; Fernández, Elena; **Saldanha-da-Gama, F.** Heuristic solutions to the facility location problem with general Bernoulli demands. *INFORMS J. Comput.* 29 (2017), no. 4, 737–753.
2. Bektaş, Tolga; **Gouveia,** Luís; Santos, Daniel. New path elimination constraints for multi-depot routing problems. *Networks* 70 (2017), no. 3, 246–261.
3. **Carvalho, F. D**.; **Almeida, M. T.** *The triangle k-club problem*. *J. Comb. Optim.* 33 (2017), no. 3, 814–846.
4. Castillo, P. A., **Castro, P. M.**, Mahalec, V. Global Optimization of Nonlinear Blend-Scheduling Problems, *Engineering* 3 (2017), no. 2, 188-201.
5. Castro, Jordi; Nasini, Stefano; **Saldanha-da-Gama, F**. A cutting-plane approach for large-scale capacitated multi-period facility location using a specialized interior-point method. *Math. Program.* 163 (2017), no. 1-2, Ser. A, 411–444.
6. **Castro, P. M**. Mostafaei, H. Product-centric Continuous-time Formulation for Pipeline Scheduling, *Computers & Chemical Engineering* 104 (2017), 283-295.
7. **Castro, P. M**. Optimal Scheduling of Multiproduct Pipelines in Networks with Reversible Flow. *Ind. Eng. Chem. Res.* 56 (2017), no. 34, 9638-9656.
8. **Castro, P. M**. Spatial branch-and-bound algorithm for MIQCPs featuring multiparametric disaggregation. *Optim. Methods Softw.* 32 (2017), no. 4, 719–737.
9. **Constantino, M.**; **Martins, I**. Branch-and-cut for the forest harvest scheduling subject to clearcut and core area constraints. *European J. Oper. Res.* 265 (2018), no. 2, 723–734.
10. **Constantino, Miguel**; **Mourão, M. Cândida**; Pinto, Leonor S. Dissimilar arc routing problems. *Network*s 70 (2017), no. 3, 233–245.
11. Fachada, N.; **Lopes, V. V**.; Martins, R. C.; Rosa, A. C. Parallelization Strategies for Spatial Agent-Based Models. *International Journal of Parallel Programming* 45 (2017), no. 3, 449-481.
12. **Fonseca, Raquel J**. Capital asset pricing model—a structured robust approach. *Optimization and decision science: methodologies and applications* (2017), 385–392.
13. Fortz, Bernard; **Gouveia, Luís**; Joyce-Moniz, Martim. Models for the piecewise linear unsplittable multicommodity flow problems. *European J. Oper. Res.* 261 (2017), no. 1, 30–42.

14. Gouveia, Luis; Leitner, Markus. Design of survivable networks with vulnerability constraints. *European J. Oper. Res.* 258 (2017), no. 1, 89–103.
15. **Gouveia, Luis**; Leitner, Markus; Ruthmair, Mario. Extended formulations and branch-and-cut algorithms for the black-and-white traveling salesman problem. *European J. Oper. Res.* 262 (2017), no. 3, 908–928.
16. **Gouveia, Luis**; Pióro, Michał; Rak, Jacek. Preface: static and dynamic optimization models for network routing problems. *Networks* 69 (2017), no. 1, 3–5.
17. **Gouveia, Luis**; Simonetti, Luidi. Spanning trees with a constraint on the number of leaves. *A new formulation. Comput. Oper. Res.* 81 (2017), 257–268.
18. Inácio, P., **José Gomes, J.**, Airaksinen, M., Cavaco, A. Exploring sociodemographic and economic factos that promote adverse drug reactions reporting by patients. *Health Policy* 122 (2017), no.3, 263-268
19. Lopes, I., **Martins, I.**, **Mesquita, M.**, Valença de Sousa, V., Ferreira-Dias, S. Designing *healthy* ice creams with linear programming: an application using traditional Portuguese products, *Journal of Food Process Engineering* (2017).
20. **Marques, I.**; **Captivo, M. E**. Different stakeholders' perspectives for a surgical case assignment problem: deterministic and robust approaches. *European J. Oper. Res.* 261 (2017), no. 1, 260–278.
21. Martins, Carlos Lúcio; Fonseca, M. da C.; **Pato, M. V**. Modeling the steering of international roaming traffic. *European J. Oper. Res.* 261 (2017), no. 2, 735–754.
22. **Martins, P.** Integrating financial planning, loaning strategies and project scheduling on a discrete-time model, *Journal of Manufacturing Systems 44 (2017), no.1,* 217-229.
23. **Martins, P.**; Neves, Elisabete. Corporates' control strategies using network optimization. *Int. Trans. Oper. Res.* 24 (2017), no. 5, 1041–1059.
24. **Mesquita, M.**; Murta, A. G.; **Paias, A.**; Wise, L. A metaheuristic approach to fisheries survey route planning. *Int. Trans. Oper. Res.* 24 (2017), no. 3, 439–464.
25. **Mesquita, M.**; Murta, Alberto G.; **Paias, A.**; Wise, Laura. A metaheuristic approach to fisheries survey route planning. *Int. Trans. Oper. Res.* 24 (2017), no. 3, 439–464.
26. **Mourão, M. C.**; Pinto, L. S. An updated annotated bibliography on Arc Routing Problems. *Networks* 70 (2017), no. 3.
27. Neto, Teresa; **Constantino, M.**; Martins, Isabel; Pedroso, João Pedro. Forest harvest scheduling with clearcut and core area constraints. *Ann. Oper. Res.* 258 (2017), no. 2, 453–478.
28. **Respício, A.**, Martinho, R, Domingos, D. Reliability of AAL systems modeled as BPMN business processes, *Lecture Notes in Business Information Processing*, 291 (2017), 535-550.
29. Scholz, Teresa; Raischel, Frank; **Lopes, V. V.**; Lehle, Bernd; Wächter, Matthias; Peinke, Joachim; Lind, Pedro G. Parameter-free resolution of the superposition of stochastic signals. *Phys. Lett. A* 381 (2017), no. 4, 194–206.
30. Ting, L., **Castro, P. M.**, Zhimin, L. Life Cycle Assessment and Optimization of an Iron Making System with a Combined Cycle Power Plant: a Case study from China, *Clean Technologies and Environmental Policy* 19 (2017), no. 4, 1133-1145.

Geometry

1. **Fernandes, T. M.**; Sabbah, Claude. Relative Riemann-Hilbert correspondence in dimension one. *Port. Math.* 74 (2017), no. 2, 149–159.
2. **Fernandes, T. M.**; Sabbah, Claude. *Riemann-Hilbert Correspondence for Mixed Twistor D-Modules*. J. Ints. Math Jussieu (2017), 1-44
3. **Florentino, C.**; Lawton, Sean; Ramras, Daniel. Homotopy groups of free group character varieties. *Ann. Sc. Norm. Super. Pisa Cl. Sci.* (5) 17 (2017), no. 1, 143–185.

Ordinary Differential Equations and Dynamical Systems

1. **Buescu, J.**; Paixão, A. C.; Symeonides, A. Complex positive definite functions on strips. *Complex Anal. Oper. Theory* 11 (2017), no. 3, 627–649.
2. Cabada, Alberto; **Enguiça, R.**; López-Somoza, Lucía; Positive solutions for second-order boundary-value problems with sign changing Green's functions. E*lectron. J. Differential Equations* (2017), no. 245, 1-17.
3. **Caetano, Diogo**; **Faria, T**. Stability and attractivity for Nicholson systems with time-dependent delays. *Electron*. *J. Qual. Theory Differ. Equ.* (2017), no. 63, 1-19.
4. Del Magno, G., Lopes Dias, J., **Duarte, P**., Pedro Gaivão, J., Hyperbolic polygonal billiards with finitely many ergodic srb measures, *Ergodic Theory and Dynamical Systems* (2017), 1–24.
5. **Duarte, P.**; Gaivão, José Pedro; Soufi, Mohammad. Hyperbolic billiards on polytopes with contracting reflection laws. *Discrete Contin. Dyn. Syst.* 37 (2017), no. 6, 3079–3109.
6. **Enguiça, R.**, Ortega, R., Functions with Average and Bounded Motions of a Forced Discontinuous, Journal of Dynamics and Differential Equations (2017), 1-14.
7. **Faria, T**. Periodic solutions for a non-monotone family of delayed differential equations with applications to Nicholson systems. *J. Differential Equations* 263 (2017), no. 1, 509–533.
8. **Faria, T.**, Obaya, R., Sanz, A. M. Asymptotic behaviour for a class of non-monotone delay differential systems with applications. *J. Dyn. Diff. Equ.* (2017), 1-14.
9. **Faria, T.**, Oliveira, J. J. Existence of positive periodic solutions for scalar delay differential equations with and without impulses. *J. Dyn. Diff* (2017), 1-23.
10. **Faria, T.**, **Caetano, D.** Stability and attractivity for Nicholson systems with time-dependent delays, *Electron. J. Qual. Theory Differ. Que.* 63 (2017), 1-19
11. **Gidoni, P.**; DeSimone, Antonio. On the genesis of directional friction through bristle-like mediating elements. *ESAIM Control Optim. Calc. Var.* 23 (2017), no. 3, 1023–1046.
12. **Gidoni, P.**; DeSimone, Antonio. Stasis domains and slip surfaces in the locomotion of a bio-inspired two-segment crawler. *Meccanica* 52 (2017), no. 3, 587–601.

13. **Margheri, A.**; Ortega, Rafael; **Rebelo, C.** First integrals for the Kepler problem with linear drag. *Celestial Mech. Dynam. Astronom.* 127 (2017), no. 1, 35–48.
14. **Margheri, A.**; Ortega, Rafael; **Rebelo, C.** On a family of Kepler problems with linear dissipation. *Rend. Istit. Mat. Univ. Trieste* 49 (2017), 265–286.
15. **Margheri, A.**; **Rebelo, C.**; Gomes, M. Gabriela M. Heterogeneity in disease risk induces falling vaccine protection with rising disease incidence. *Dyn. Syst.* 32 (2017), no. 1, 148–163.
16. **Serpa, C.**; **Buescu, J.** Constructive solutions for systems of iterative functional equations. *Constr. Approx.* 45 (2017), no. 2, 273–299.

Stochastic Analysis, Mathematical Physics and Applications

1. Aguirre, C., Franzese, G., Esposito, F., Vázquez, L., **Vilela Mendes, R.**, Caro, R., Ramírez-Nicolás, N., Cozzolino, F., Popa, C. I. Signal-adapted tomography as a tool for dust devil detection, *Aeolian Research* 29 (2017), 12-22.
2. **Araújo, T**., Faustino, R. The Topology of Inter-industry Relations from the Portuguese National Accounts. *Physica A: Statistical Mechanics and its Applications* 479 (2017), 236-248.
3. Bock, Wolfgang; Fattler, Torben; **Streit, L.**. Stochastic quantization for the fractional Edwards measure. *Acta Appl. Math.* 151 (2017), 81–88.
4. Luís da Silva, José, **Streit, L.**, Form factors for random paths and polymer models, a progress report, *AIP Conference Proceedings* 1871 (2017), no. 1.
5. **Vilela Mendes, R**. A consistent measure for lattice Yang-Mills. *Internat. J. Modern Phys*. A 32 (2017), no. 2-3, 1750016, 15 pp.
6. **Vilela Mendes, R**. Current algebra, statistical mechanics and quantum models. *J. Stat. Mech. Theory Exp.* 2017, no. 11, 113104, 23 pp.
7. **Vilela Mendes, R**. Superprocesses on ultradistributions. *Stochastics* 89 (2017), no. 6-7, 896–909.
8. **Vilela Mendes, R**. The geometry of noncommutative space-time. *Internat. J. Theoret. Phys.* 56 (2017), no. 1, 259–269.
9. **Vilela Mendes, R.**; Bizaro, João P. S. Analytical study of grouwth estimates, control of fluctuations and conservative structures in a two-field model of the scrape-off layer. *Physics of Plasmas* 24 (2017), no. 1.

Mathematical Logic

1. **Dinis, B.**; **Ferreira, F**. Interpreting weak Kőnig's lemma in theories of nonstandard arithmetic. *MLQ Math. Log. Q.* 63 (2017), no. 1-2, 114–123.

2. **Dinis, B.**; van den Berg, I. Axiomatics for the external numbers of nonstandard arithmetic, *MLQ Math. Log. Q*. 63 (2017), no. 1-2, 114-123
3. **Dinis, B.**; van den Berg, I. On the quotient class of non archimedean fields. *J. Log. Anal.* 9 (2017), paper no. 7, 47 pp.
4. **Edmundo, M. J.**; Mamino, Marcello; Prelli, Luca; Ramakrishnan, Janak; Terzo, Giuseppina On Pillay's conjecture in the general case. *Adv. Math.* 310 (2017), 940–992.
5. **Ferreira, F.**; **Ferreira, G**. A herbrandized functional interpretation of classical first-order logic. *Arch. Math. Logic* 56 (2017), no. 5-6, 523–539.
6. **Ferreira, G.** Eta-conversions of IPC implemented in atomic F, *Logic Journal of the IGPL* 25 (2017), no. 2, 115-130.
7. **Ferreira, G.**, Rasiowa-Harrop disjunction property, *Studia Logica* 105 (2017), no. 3, 649-664.
8. **Frittaion, E.** Brown's lemma in second-order arithmetic. *Fund. Math.* 238 (2017), no. 3, 269-283
9. **Frittaion, E**.; Patey, L. Coloring the rationals in reverse mathematics. *Computability* 6 (2017), no. 4, 319-331
10. Mateus, P.; **Sernadas, A**.; Souto, A. Universality of quantum Turing machines with deterministic control. *Journal of Logic and Computatio*n 27 (2017), no. 1, 1-19.
11. **Rasga, J.**; **Sernadas, C**.; Mateus, P.; Sernadas, A. Decision and optimization problems in the unreliable-circuit logic. *Log. J. IGPL* 25 (2017), no. 3, 283–308.

Biomathematics and Statistics

1. Inácio, P., **José Gomes, J.**, Airaksinen, M., Cavaco, A. Exploring sociodemographic and economic factors that promote adverse drug reactions reporting by patients. *Health Policy* 122 (2017), no. 3, 263-268.
2. **Stollenwerk, N.**; Sommer, P. F.; Kooi, B. W.; Mateus, L.; Ghaffari, P.; Aguiar, M. Hopf and torus bifurcations, torus destruction and chaos in population biology. Ecological Complexity 30 (2017), 91-99

Appendix: Complementary Information

Nonlinear PDEs and Applications

Communications in seminars or conferences

International

A. C. Barroso, "Second-Order Structured Deformations of Continua", CIM-WIAS Workshop, Lisboa, December 2017.

A. C. Barroso, "Variational Models for Phase Transitions in the Presence of Surfactants", AIMETA 2017, Salerno, Itália, September 2017.

National

A. C. Barroso*,* A Model for Phase Transitions with Competing Terms, Workshop on Mathematics in Memory of Graça Carita, Évora, March 2017.

Research supervision

PhD

Mathias Hoffman, LisMath PhD (supervised by **Hugo Tavares**)

Simão Correia, "Dynamics for Schroedinger Evolution Problems", November 2017 (supervised by **Mário Figueira**)

Postgraduation

Alberto Saldaña, Postgraduation Scolarship (supervised by **Hugo Tavares**)

Conferences and Courses organized

Seminário Análise e Equações Diferenciais, CMAFcIO (organized by **Hugo Tavares** and **Nicolas Van Goethem**)

Operations Research

Communications in seminars or conferences

International

P. Martins, "Capital and loaning constrained project scheduling", Optimization 2017, organised by CMAFCIO, Faculdade de Ciências, ULisboa, Lisboa, Portugal, September 2017

Marta Mesquita, **Margarida Moz**, **Ana Paias** and **Margarida Vaz Pato**, "A decompose-and fix heuristic for re-rostering bus drivers", Optimization 2017, organised by CMAFCIO, Faculdade de Ciências, ULisboa, Lisboa, Portugal, September 2017

Maria da Conceição Fonseca, Carlos Lúcio Martins and **Margarida Vaz Pato**, "Performance comparison of modeling approaches for the Steering of International Roamimg problem", Optimization 2017, organised by CMAFCIO, Faculdade de Ciências, ULisboa, Lisboa, Portugal, September 2017

Teresa Melo, Carlos Lúcio Martins and **Margarida Vaz Pato**, "A tri-objective multi-period model to redesign a food bank supply chain network", OR2017 Conference – The Annual International Conference of the German Operations Research Society (GOR), Freie Universität Berlin, Berlin, Germany, September 2017.

Teresa Melo, Carlos Lúcio Martins and **Margarida Vaz Pato,** "Redesign of a food bank supply chain considering economic, environmental and social issues", ISOLDE XIV – International Symposium on Locational Decisions 2017, Toronto and Huntsville Ontario, Canada, July 2017

Marta Mesquita, **Margarida Moz**, **Ana Paias** and **Margarida Vaz Pato**, "An integrated framework for bus driver rotering and re-rostering", VeRoLog – 6th Meeting of the EURO Working Group on Vehicle Routing and Logistics Optimization, Vrije Universiteit Amsterdam, Amsterdam, Holland, July 2017

Filipa Duarte de Carvalho, "k-clubs with diameter constrained spanning trees", Optimization 2017, Lisboa, Portugal, September 6-8, 2017.

M. Constantino, **M. C. Mourão**, L. S. Pinto; "Arc Routing in Money Collection", VeRoLog 2017 - Conference of the EURO Working Group on Vehicle Routing and Logistics Optimization, Amsterdam, Netherlands, July 2017

M.C. Mourão, **M. Constantino**; L.S. Pinto; "Dissimilar Arc Routing Problems". INOC 2017 – 8th International Network Optimization Conference, Faculdade de Ciências, Universidade de Lisboa, Lisboa, Portugal, February 26-28.

Juanjo Peiró, Ángel Corberán, Rafael Martí, **Francisco Saldanha da Gama**, "Heuristic solutions for a class of stochastic uncapacitated p-hub median problems", INFORMS 2017, conferência annual do Institute for the Operations Research and Management Science, Houston, Texas, EUA, October 22-25, 2017.

Maria Albareda-Sambola, Elena Fernández, **Francisco Saldanha da Gama**, "Service location for unit-demand customers: dealing with uncertainty", Optimization 2017, Lisboa, Portugal, September 6-8, 2017.

Ángel Corberán, Rafael Martí, Juanjo Peiró, **Francisco Saldanha da Gama**, "A heuristic algorithm for r-allocation p-hub median problems", IFORS XXI, 21th Conference of the International Federation of the Operations Research Societies, Quebec City, Quebec, Canadá, July 17-21, 2017.

Ángel Corberán, Rafael Martí, Juanjo Peiró, **Francisco Saldanha da Gama**, "A heuristic algorithm for the stochastic uncapacitated r-allocation p-hub median problem", ISOLDE XIV, 14th International Symposium on Locational Decisions, Toronto e Huntsville, Canadá, July 9-14, 2017.

Ángel Corberán, Rafael Martí, Junajo Peiró, **Francisco Saldanha da Gama**, "Stochastic uncapacitated r-allocation p-hub median problems: modeling framework and heuristic solutions", INOC'2017, International Network Optimization Conference, Lisboa, Portugal, February 26-28, 2017

National

P. Martins, "Constrained partitions in graphs: bio and financial applications", seminar, Laboratório de Matemática Computacional do grupo de Análise Numérica e Optimização do Centro de Matemática da Universidade de Coimbra (CMUC), February 15, 2017.

Margarida Vaz Pato, Carlos Lúcio Martins and Teresa Melo, "Lexicographic solutions for a tri-objective multi-period model to redesign a food bank supply chain network", seminar, Departamento de Matemática, FCT, Universidade Nova de Lisboa, Monte da Caparica, Portugal, December 2017

Angelo Aliano Filho, **Margarida Vaz Pato** and Helenice de Oliveira Florentino, "O Método de Tchebycheff Modificado no Problema de Rotação de Culturas Biobjetivo", CNMAC 2017 - XXXVII Congresso Nacional de Matemática Aplicada e Computacional, São José de Campos, Brazil, September 2017.

João Miranda, Ana Paula Teixeira and Margarida Vaz Pato, "Estudo Europeu em Investigação Operacional no Ensino Superior: resultados importantes e tendências preliminares, IO 2017 – 18º Congresso da APDIO, Valença do Minho, Portugal, June 2017.

M. Constantino, **M.C. Mourão**, L.S. Pinto; "Rotas para recolha de valores nos arcos", IO 2017 - 18º Congresso da APDIO, Escola Superior de Ciências Empresariais de Valença, Instituto de Politécnico de Viana do Castelo, June 2017.

M.C. Mourão; "Arc Routing Today - Theory vs Practice", seminar, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, December 2017.

Organized conferences and courses

ISCBI 2017, 5th International Symposium on Computational and Business Intelligence, Dubai, United Arab Emirates, August 11-14, 2017 (**Francisco Saldanha da Gama**, Honorary Conference Chair)

Research supervision

Master

António Francisco de Melo Fernandes, "Credit Scoring: Uma Análise Econométrica", November 2017 (co-supervised by **Maria Cândida Mourão** and Isabel Proença)

Inês Patrícia Canelas Vitorino, "Análise de Dados de Manutenção. Estimação de Probabilidades de Falhas", ISEG (ULisboa), internship on the company Produtos e Serviços de Estatística (PSE), December 2017 (supervised by **Margarida Vaz Pato** and co-supervised by Nuno Santos).

Ivo Moreira Mendes, "Aplicação do Problema de Cobertura a Sistemas de Videovigilância", Instituto Politécnico de Coimbra - ISCAC - Mestrado em Sistemas de Informação de Gestão, December 2017 (supervised **Pedro Martins**)

Joana Margarida dos Santos Bastos, "Otimização da Distribuição de Mercadorias para as Lojas Makro", ISEG (ULisboa), internship on the company Transportes Florêncio e Silva (TFS), December 2017 (supervised by **Margarida Vaz Pato** and co-supervised by Nelson Lopes)

Micaela Dinis Costa da Cruz Toscano, "Identificação de Rotas para Recolha Periódica de Resíduos de Papeleiras", December, 2017 (co-supervised by **Maria Cândida Mourão** and **Margarida Moz**).

Tiago da Luz Vicente, "Otimização dos giros de coleta", April 2017 (co-supervised by **Maria Cândida Mourão** and Vasco Móra)

Mariana Bordalo Cristiano, "Estimização da sensibilidade, da especificidade e da curva ROC – um estudo de caso", Escola Superior de Tecnologia e Gestão do Instituto Politécnico de Leiria, October 2017 (supervised by **Liliana Ferreira** and co-supervised by Rui Santos)

Investigation Scolarship

Dinis Seward, *Novos Talentos em Matemática 2017-18* (supervised by Luís Gouveia)

Micaela Dinis Costa da Cruz Toscano, projecto SEROW (PTDC/EGE-GES/121406/2010), financed by FCT, "IO-Otimização de Rotas), 2017 (supervised by **Maria Cândida Mourão**)

Geometry

Communications in seminars or conferences

International

A. Casimiro (speaker), **C. Rodrigo**, “Reduction of forward difference operators in principal G-bundles”, The Cape Verde International Days on Mathematics 2017, University of Cape Verde, Praia, 8-11 May 2017.~

A. Casimiro (speaker), **C. Rodrigo**, “Variational integrators for reduced field Equations”, The Cape Verde International Days on Mathematics 2017, University of Cape Verde, Praia, 8-11 May 2017.

A. Casimiro (speaker), **C. Rodrigo**, "Reduction of Discrete Lagrangian Gauge Field Theories", 3rd INTERNATIONAL CONFERENCE ON SYMMETRIES, DIFFERENTIAL EQUATIONS AND APPLICATIONS, ITÜ, Istambul, Turkey, 14-17 August 2017.

A. Casimiro (speaker), **C. Rodrigo**, "Numerical Integrators in reduced coordinates for Lagrangian gauge field theories", 3rd INTERNATIONAL CONFERENCE ON SYMMETRIES, DIFFERENTIAL EQUATIONS AND APPLICATIONS, ITÜ, Istambul, Turkey, 14-17 August 2017.

C. Rodrigo (speaker), ”Variational Integrators for Euler-Poincaré equations", XXVI International Fall Workshop on Geometry and Physics (IFWGP), Universidade do Minho, Braga, Portugal, 4 September 2017

Invited survey

Á. Quintino, *Transformations of generalized harmonic bundles and constrained Willmore surfaces* (invited contribution, reviewed and refereed), Willmore Energy and Willmore Conjecture, Chapman & Hall/CRC Monographs and Research Notes in Mathematics , CRC Press, Taylor and Francis Group, ISBN 9781498744638 - CAT# K26902 (2017).

Ordinary Differential Equations and Dynamical Systems

Communications in seminars or conferences

International

C. Gonçalves, “Recent results on epidemiological models and on prey-predator models”, Nonlinear Meeting in Udine 2017 (Università di Udine, January 2017)

C. Gonçalves, “Periodic solutions of asymptotically linear second order equations: recent and not so recent results”, Workshop on ``Nonlinear Differential Equations'' on the occasion of the 65th birthday of prof. Fabio Zanolin Trieste, Italy
December 21, 2017

L. Sanchez, “Positive Dirichlet and homoclinic solutions for some second order singular equations”, ICDDEA 2017, Amadora, junho 2017.

T. Faria, “Global dynamics for some classes of delay differential systems from population dy- namics”, CEDYA+CMA, Cartagena, Spain, June 26-30, 2017 (invited speaker in special session).

T. Faria, “Positive periodic solutions for delay differential equations with nonmonotone non- linearity”, International Conference on Differential and Difference Equations and Applications, Military Academy, Amadora, Portugal, June 5–9, 2017 (invited speaker in special session).

National

T. Faria, “Positive periodic solutions for a family of impulsive delay differential equations”, Encontro CAMGSD-CMAFCIO de Equações Diferenciais, FCUL, Lisboa, 14-15 Setembro de 2017

Research supervision

Master

D. Caetano, “Linear Stability for Differential Equations with Infinite Delay via Semigroup Theory”, September 2017- June de 2018 (supervised by **Teresa Faria**)

Scientific Internship

Prof. **Rubén Figueroa** (Universidade de Santiago de Compostela, Espanha*): estágio científico* no CMAF-CIO (Abril-Junho 2017), investigation post-doc scolarship supervised by **Teresa Faria** and co-supervised by **Luís Sanchez**)

Scientific Project

Diogo Caetano, “Asymptotic Behaviour of Delay Differential Equations in Population Models”, Programa de Estímulo à Investigação 2016 da Fundação Calouste Gulbenkian, Dezember 2016 – July 2018 (supervised by **Teresa Faria**)

Scolarship´

Luís Ferreira, *Novos Talentos em Matemática* (supervised by **Luís Sanchez**)

Stochastic Analysis, Mathematical Physics and Applications

Communications in seminars or conferences

International

M. J. Oliveira, "An infinite dimensional umbral calculus", Particle Systems and PDE's - VI, Laboratoire J. A. Dieudonné (Faculté des Sciences, CNRS - Université de Nice Sophia Antipolis), Nice, France, November 27 - December 1, 2017.

M. J. Oliveira, "An infinite dimensional umbral calculus", Madeira Math Encounters XLVI, Infinite Dimensional Analysis and Applications, Universidade da Madeira, August 2 – 9, 2017.

M. J. Oliveira, "A new approach to the combinatorial harmonic analysis on configuration spaces", Arrábida Meeting and Lisbon Workshop Mathematical Approaches to Complex Systems: Statistical Mechanics and Partial Differential Equations, 3-7 July 2017.

M. J. Oliveira, "An infinite dimensional umbral calculus", Oberwolfach Workshop Real Algebraic Geometry with a View Toward Moment Problems and Optimization, MFO (Mathematisches Forschungsinstitut Oberwolfach), Oberwolfach, Germany, 5 - 11 March 2017

R. Vilela Mendes, "Noncommutative probability and noncommutative processes**";** International Conference on Stochastic Analysis and Applications, Hammamet, October 24 – 27, 2017

R. Vilela Mendes, "On quantum corrections to the kinetic equations: A deformation approach"; International Conference on Particle Systems and PDE's VI, Nice, November 27 – December 1.

Conferences and courses organized

Workshop Long-range Coupled Polymers: Analysis and Simulation, Academia das Ciências de Lisboa, February 5 - 11 , 2017 (M. J. Oliveira, L. Streit, R. Vilela Mendes members of Organizing Committee)

Mathematical approaches to complex systems: Statistical mechanics and partial differential equations, Arrábida, July 2 – 7, 2017 (R. Vilela Mendes member of Organizing Committee)

Seminar organized by **CMAFCIO** and GFM: Global solutions to random 3D vorticity equations for small initial data, March 31, 2017.

Book Chapters

R. Vilela Mendes; *"*Ultradistribution spaces: superprocesses and nonlinear differential problems*"*, in "Particle Systems and Partial Differential Equations IV", Springer 2017.

M. J. Oliveira, "White Noise Analysis: An Introduction", in T. Hida and L. Streit (eds.), "Let Us Use White Noise", pp. 1-36, World Scientific Publ. Co., 2017. ISBN: 978-981-3220-93-5

Mathematical Logic

Conferences and Courses organized

Conference Axiomatic Thinking, Academia das Ciências de Lisboa, Universidade Nova de Lisboa, October 11, 2017.

Biomathematics and Statistics

Proceedings

Nico Stollenwerk, **Raquel Filipe**, **Luís Mateus**, **Peyman Ghaffari,** Effective parameters, likelihoods and Bayesian model selection in application to epidemiological models: from SHAR to effective SIR models, *Proceedings of the 17th International Cofnerence on Computational and Mathematical Methods in Science and Engineering*, CMSSE 2017, July 4-8, 2017.