Spyridon D. Mourtas

A: Chrisippou 14, Zografou, 15773, Greece
M: spirosmourtas@gmail.com
W: users.uoa.gr/~spirmour/

Personal Information

Date of Birth: 03/12/1987
Nationality: Hellenic
Marital Status: Single
Military Obligations: Fulfilled
Driving License: Class B

WORK EXPERIENCE

Siberian Federal University
Junior Researcher
2022-Current

National and Kapodistrian University of Athens
External Academic Collaborator and Teaching Staff
2018-Current

Digital Agency socials.gr
External Collaborator
2015 - 2017

Conservatories of Music: Patraiko, Patraiko Riou, Neo Odio Riou, Europio, Anastasopoulou, Messatidos
Classical guitar, electric guitar and music theory teacher
2007 - 2015

ACADEMIC TEACHING EXPERIENCE

National and Kapodistrian University of Athens
Department of Economics

Courses:

- **Applied Operational Research,** Undergraduate Program (ECON907), *2024*
- **Advanced Excel Laboratory,** MSc Program in Quantitative Investing (ECON897), *2024*
- **Mathematics I (course tutorial),** Undergraduate Program (ECON299), *2023 - 2024*
- **Mathematical Programming Techniques,** Undergraduate Program (ECON871), *2023 - 2024*
- **MATLAB Laboratory,** MSc Program in Quantitative Investing (ECON748), *2023 - 2024*
- **Linear Maths (laboratory course),** Undergraduate Program (ECON325), *2019, 2021 - 2024*

- **Research Methods Seminar,** MSc Program in Quantitative Investing (ECON829), *2023 - 2024*
- **Introduction to Computer Science and Data Analysis (laboratory course),** Undergraduate Program (ECON198), *2018 - 2019*

National and Kapodistrian University of Athens
Department of Business Administration

Courses:

- **Theory and Applications of Optimization Methods,** Undergraduate Program (BA285), *2024*
- **Mathematical Calculus in Business Problems**, Undergraduate Program (BA261), *2023 - 2024*

EDUCATION

Postdoctoral researcher at the Department of Economics of National and Kapodistrian University of Athens, Greece with postdoctoral research title *"Fusion Optimization Algorithms and Artificial Intelligence Techniques for Financial Engineering Problems"*
2023 - Current

PhD in Economics of the Department of Economics of National and Kapodistrian University of Athens, Greece with dissertation title *"Intelligent Online Optimization Algorithms for Portfolio Analysis and Management"*
2019 - 2023

MSc in Applied Economics and Finance with direction in Mathematical Finance and Risk Analysis of the Department of Economics of National and Kapodistrian University of Athens, Greece
2017 - 2019

BSc in Mathematics with direction in Computer Science and Computational Mathematics of the Department of Mathematics of the University of Patras, Greece
2006 – 2016

PUBLICATIONS

Research Articles

1) P.S. Stanimirović, **S.D. Mourtas**, D. Mosić, V.N. Katsikis, X. Cao, S. Li, *"Zeroing neural network approaches for computing time-varying minimal rank outer inverse"*, **Applied Mathematics and Computation**, 465, 128412 (2024)
2) **S.D. Mourtas**, V.N. Katsikis, P.S. Stanimirović, L.A. Kazakovtsev, *"Credit and Loan Approval Classification Using a Bio-Inspired Neural Network"*, **Biomimetics**, 9(2), 120 (2024)
3) H. Jerbi, I. Al-Darraji, S. Albadran, S.B. Aoun, T.E. Simos, **S.D. Mourtas**, V.N. Katsikis, *"Solving quaternion nonsymmetric algebraic Riccati equations through zeroing neural networks"*, **AIMS Mathematics**, 9(3), 5794-5809 (2024)

4) Y. He, X. Dong, T.E. Simos, **S.D. Mourtas**, V.N. Katsikis, D. Lagios, P. Zervas, G. Tzimas, *"A bio-inspired weights and structure determination neural network for multiclass classification: Applications in occupational classification systems"*, **AIMS Mathematics**, 9(1), 2411-2434 (2024)
5) H. Jerbi, O. Alshammari, S.B. Aoun, M. Kchaou, T.E. Simos, **S.D. Mourtas**, V.N. Katsikis, *"Hermitian Solutions of the Quaternion Algebraic Riccati Equations through Zeroing Neural Networks with Application to Quadrotor Control"*, **Mathematics**, 12(1), 15 (2024)
6) S.B. Aoun, N. Derbel, H. Jerbi, T.E. Simos, **S.D. Mourtas**, V.N. Katsikis, *"A quaternion Sylvester equation solver through noise-resilient zeroing neural networks with application to control the SFM chaotic system"*, **AIMS Mathematics**, 8(11), 27376-27395 (2023)
7) V.N. Kovalnogov, R.V. Fedorov, I.I. Shepelev, V.V. Sherkunov, T.E. Simos, **S.D. Mourtas**, V.N. Katsikis, *"A novel quaternion linear matrix equation solver through zeroing neural networks with applications to acoustic source tracking"*, **AIMS Mathematics**, 8(11), 25966-25989 (2023)
8) **S.D. Mourtas**, E. Drakonakis, Z. Bragoudakis, *"Forecasting the gross domestic product using a weight direct determination neural network"*, **AIMS Mathematics**, 8(10), 24254-24273 (2023)
9) V.N. Kovalnogov, R.V. Fedorov, D.A. Demidov, M.A. Malyoshina, T.E. Simos, **S.D. Mourtas**, V.N. Katsikis, *"Computing quaternion matrix pseudoinverse with zeroing neural networks"*, **AIMS Mathematics**, 8(10), 22875-22895 (2023)
10) T.E. Simos, V.N. Katsikis, **S.D. Mourtas**, P.S. Stanimirović, *"Solving Time-Varying Nonsymmetric Algebraic Riccati Equations With Zeroing Neural Dynamics"*, **IEEE Transactions on Systems, Man, and Cybernetics: Systems**, 53(10), 6575-6587 (2023)
11) R. Abbassi, H. Jerbi, M. Kchaou, T.E. Simos, **S.D. Mourtas**, V.N. Katsikis, *"Towards Higher-Order Zeroing Neural Networks for Calculating Quaternion Matrix Inverse with Application to Robotic Motion Tracking"*, **Mathematics**, 11(12), 2756 (2023)
12) V.N. Kovalnogov, R.V. Fedorov, D.A. Demidov, M.A. Malyoshina, T.E. Simos, V.N. Katsikis, **S.D. Mourtas**, R.D. Sahas, *"Zeroing neural networks for computing quaternion linear matrix equation with application to color restoration of images"*, **AIMS Mathematics**, 8(6), 14321-14339 (2023)
13) D. Mosić, P.S. Stanimirović, **S.D. Mourtas**, *"Minimal Rank Properties of Outer Inverses with Prescribed Range and Null Space"*, **Mathematics**, 11(7), 1732 (2023)
14) H. Alharbi, O. Alshammari, H. Jerbi, T.E. Simos, V.N. Katsikis, **S.D. Mourtas**, R.D. Sahas, *"A Fresnel Cosine Integral WASD Neural Network for the Classification of Employee Attrition"*, **Mathematics**, 11(6), 1506 (2023)
15) V.N. Katsikis, **S.D. Mourtas**, P.S. Stanimirović, S. Li, X. Cao, *"Time-varying minimum-cost portfolio insurance problem via an adaptive fuzzy-power LVI-PDNN"*, **Applied Mathematics and Computation**, 441, 127700 (2023)
16) V.N. Katsikis, P.S. Stanimirović, **S.D. Mourtas**, L. Xiao, D. Stanujkic, D. Karabasevic, *"Zeroing Neural Network Based on Neutrosophic Logic for Calculating Minimal-Norm Least-Squares Solutions to Time-Varying Linear Systems"*, **Neural Processing Letters**, 55, 8731-8753 (2023)

17) **S.D. Mourtas**, C. Kasimis, V.N. Katsikis, "*Robust PID controllers tuning based on the beetle antennae search algorithm*", **Memories - Materials, Devices, Circuits and Systems**, 4, 100030 (2023)
18) D. Lagios, **S.D. Mourtas**, P. Zervas, G. Tzimas, *"A Weights Direct Determination Neural Network for International Standard Classification of Occupations"*, **Mathematics**, 11(3), 629 (2023)
19) H. Alharbi, H. Jerbi, M. Kchaou, R. Abbassi, T.E. Simos, **S.D. Mourtas**, V.N. Katsikis, *" Time-Varying Pseudoinversion Based on Full-Rank Decomposition and Zeroing Neural Networks"*, **Mathematics**, 11(3), 600 (2023)
20) P.S. Stanimirović, B. Ivanov, D. Stanujkić, V.N. Katsikis, **S.D. Mourtas**, L.A. Kazakovtsev, S.A. Edalatpanah, *"Improvement of Unconstrained Optimization Methods Based on Symmetry Involved in Neutrosophy"*, **Symmetry**, 15(1), 250 (2023)
21) X. Li, C.-L. Lin, T.E. Simos, **S.D. Mourtas**, V.N. Katsikis, *"Computation of Time-Varying {2,3}- and {2,4}-Inverses through Zeroing Neural Networks"*, **Mathematics**, 10(24), 4759 (2022)
22) H. Jerbi, H. Alharbi, M. Omri, L. Ladhar, T.E. Simos, **S.D. Mourtas**, V.N. Katsikis, *"Towards Higher-Order Zeroing Neural Network Dynamics for Solving Time-Varying Algebraic Riccati Equations"*, **Mathematics**, 10(23), 4490 (2022)
23) P.S. Stanimirović, **S.D. Mourtas**, V.N. Katsikis, L.A. Kazakovtsev, V.N. Krutikov, *"Recurrent Neural Network Models Based on Optimization Methods"*, **Mathematics**, 10(22), 4292 (2022)
24) V.N. Kovalnogov, R.V. Fedorov, D.A. Generalov, A.V. Chukalin, V.N. Katsikis, **S.D. Mourtas**, T.E. Simos, *"Portfolio Insurance through Error-Correction Neural Networks"*, **Mathematics**, 10(18), 3335 (2022)
25) **S.D. Mourtas**, C. Kasimis, *" Exploiting Mean-Variance Portfolio Optimization Problems through Zeroing Neural Networks "*, **Mathematics**, 10(17), 3079 (2022)
26) **S.D. Mourtas**, V.N. Katsikis, E. Drakonakis, S. Kotsios, *"Stabilization of Stochastic Exchange Rate Dynamics under Central Bank Intervention using Neuronets"*, **International Journal of Information Technology and Decision Making**, 22(2), 855-883 (2023)
27) **S.D. Mourtas**, V.N. Katsikis, *"Exploiting the Black-Litterman framework through error-correction neural networks"*, **Neurocomputing**, 498, 43-58 (2022)
28) T.E. Simos, V.N. Katsikis, **S.D. Mourtas**, *"A multi-input with multi-function activated weights and structure determination neuronet for classification problems and applications in firm fraud and loan approval"*, **Applied Soft Computing**, 127, 109351 (2022)
29) **S.D. Mourtas**, *"A Weights Direct Determination Neuronet for Time-Series with Applications in the Industrial Indices of the Federal Reserve Bank of St. Louis"*, **Journal of Forecasting**, 41(7), 1512-1524 (2022)
30) T.E. Simos, V.N. Katsikis, **S.D. Mourtas**, P.S. Stanimirović, *"Unique non-negative definite solution of the time-varying algebraic Riccati equations with applications to stabilization of LTV systems"*, **Mathematics and Computers in Simulation**, 202, 164-180 (2022)
31) W. Jiang, C.-L. Lin, V.N. Katsikis, **S.D. Mourtas**, P.S. Stanimirović, T.E. Simos, *"Zeroing Neural Network Approaches Based on Direct and Indirect*

Methods for Solving the Yang–Baxter-like Matrix Equation", **Mathematics**, 10(11), 1950 (2022)

32) T.E. Simos, V.N. Katsikis, **S.D. Mourtas**, P.S. Stanimirović, "*Finite-time Convergent Zeroing Neural Network for Solving Time-Varying Algebraic Riccati Equations*", **Journal of the Franklin Institute**, 359(18), 10867-10883 (2022)

33) M. Kornilova, V. Kovalnogov, R. Fedorov, M. Zamaleev, V.N. Katsikis, **S.D. Mourtas**, T.E. Simos, "*Zeroing Neural Network for Pseudoinversion of an Arbitrary Time-Varying Matrix Based on Singular Value Decomposition*", **Mathematics**, 10(8), 1208 (2022)

34) T.E. Simos, V.N. Katsikis, **S.D. Mourtas**, P.S. Stanimirović, D. Gerontitis, "*A Higher-Order Zeroing Neural Network for Pseudoinversion of an Arbitrary Time-Varying Matrix with Applications to Mobile Object Localization*", **Information Sciences**, 600, 226-238 (2022)

35) **S.D. Mourtas**, V.N. Katsikis, C. Kasimis, "*Feedback Control Systems Stabilization Using a Bio-inspired Neural Network*", **EAI Endorsed Transactions on AI and Robotics,** 1, 1-13 (2022)

36) V.N. Katsikis, **S.D. Mourtas**, "*Diversification of Time-Varying Tangency Portfolio under Nonlinear Constraints through Semi-Integer Beetle Antennae Search Algorithm*", **AppliedMath,** 1(1), 63-73 (2021)

37) T.E. Simos, V.N. Katsikis, **S.D. Mourtas**, "*Multi-input bio-inspired weights and structure determination neuronet with applications in European Central Bank publications*", **Mathematics and Computers in Simulation**, 193, 451-465 (2021)

38) T.E. Simos, V.N. Katsikis, **S.D. Mourtas**, "*A fuzzy WASD neuronet with application in breast cancer prediction*", **Neural Computing and Applications**, 34, 3019–3031 (2021)

39) V.N. Katsikis, **S.D. Mourtas**, P.S. Stanimirović, S. Li, X. Cao, "*Time-varying mean-variance portfolio selection problem solving via LVI-PDNN*", **Computers & Operations Research**, 105582 (2021)

40) V.N. Katsikis, P.S. Stanimirović, **S.D. Mourtas**, L. Xiao, D. Karabasević, D. Stanujkić, "*Zeroing Neural Network with Fuzzy Parameter for Computing Pseudoinverse of Arbitrary Matrix*", **IEEE Transactions on Fuzzy Systems** 30(9), 3426-3435 (2022)

41) T.E. Simos, **S.D. Mourtas**, V.N. Katsikis, "*Time-varying Black–Litterman portfolio optimization using a bio-inspired approach and neuronets*", **Applied Soft Computing**, 112, 107767 (2021)

42) **S.D. Mourtas**, V.N. Katsikis, "*V-Shaped BAS: Applications on Large Portfolios Selection Problem*", **Computational Economics**, 60, 1353–1373 (2022)

43) V.N. Katsikis, **S.D. Mourtas**, P.S. Stanimirović, Y. Zhang, "*Continuous-Time Varying Complex QR Decomposition via Zeroing Neural Dynamics*", **Neural Processing Letters**, 53, 3573–3590 (2021)

44) V.N. Katsikis, **S.D. Mourtas**, "*Binary Beetle Antennae Search Algorithm for Tangency Portfolio Diversification*", **Journal of Modeling and Optimization**, 13(1), 44-50 (2021)

45) V.N. Katsikis, **S.D. Mourtas**, P.S. Stanimirović, S. Li, X. Cao, "*Time-Varying Mean-Variance Portfolio Selection under Transaction Costs and Cardinality Constraint Problem via Beetle Antennae Search Algorithm (BAS)*", **SN Operations Research Forum**, 2(2), 18 (2021)

46) V.N. Katsikis, **S.D. Mourtas**, P.S. Stanimirović, Y. Zhang, *"Solving Complex-Valued Time-Varying Linear Matrix Equations via QR Decomposition With Applications to Robotic Motion Tracking and on Angle-of-Arrival Localization"*, **IEEE Transactions on Neural Networks and Learning Systems**, 33(8), 3415-3424 (2022)
47) V.N. Katsikis, **S.D. Mourtas**, *"Optimal Portfolio Insurance under Nonlinear Transaction Costs"*, **Journal of Modeling and Optimization**, 12(2), 117-124 (2020)
48) M.A. Medvedeva, V.N. Katsikis, **S.D. Mourtas**, T.E. Simos, "*Randomized time-varying knapsack problems via binary beetle antennae search algorithm: Emphasis on applications in portfolio insurance*", **Mathematical Methods in the Applied Science**, 44(2), 2002–2012 (2020)
49) V.N. Katsikis, **S.D. Mourtas**, P.S. Stanimirović, S. Li, X. Cao, *"Time-varying minimum-cost portfolio insurance under transaction costs problem via Beetle Antennae Search Algorithm (BAS)"*, **Applied Mathematics and Computation**, 385, 125453 (2020)
50) V.N. Katsikis, **S.D. Mourtas**, *"ORPIT - a Matlab Toolbox for Option Replication and Portfolio Insurance in Incomplete Markets"*, **Computational Economics**, 56(4), 711-721 (2019)
51) V.N. Katsikis, **S.D. Mourtas**, *"A heuristic process on the existence of positive bases with applications to minimum-cost portfolio insurance in C [a,b]"*, **Applied Mathematics and Computation**, 349, 221–244 (2019)

Book Chapters

1) V.N. Katsikis, P.S. Stanimirović, **S.D. Mourtas**, S. Li, X. Cao, *"Towards Higher Order Dynamical Systems"*. In: I. Kyrchei (ed) Generalized Inverses: Algorithms and Applications. **Mathematics Research Developments**, Nova Science Publishers, Inc., New York, USA, 207-239 (2021)
2) V.N. Katsikis, **S.D. Mourtas**, "*Portfolio Insurance and Intelligent Algorithms*". In: S. Patnaik, K. Tajeddini, V. Jain (eds) Computational Management. **Modeling and Optimization in Science and Technologies**, Springer, Cham, vol. 18, 305-323 (2021)

Conference Papers

1) **S.D. Mourtas**, "*Color restoration of images through high order zeroing neural networks*". In: P.S. Stanimirović, A.A. Stupina, I.V. Kovalev (eds) Proceedings of II International Workshop "Hybrid Methods of Modeling and Optimization in Complex Systems", November 28-30, Krasnoyarsk, Russia, 2023. **ITM Web of Conferences**, EDP Sciences, Paris, France, vol. 59, 01005 (2024)
2) **S.D. Mourtas**, "*Customer churn classification through a weights and structure determination neural network*". In: P.S. Stanimirović, A.A. Stupina, I.V. Kovalev (eds) Proceedings of II International Workshop "Hybrid Methods of Modeling and Optimization in Complex Systems", November 28-30, Krasnoyarsk, Russia, 2023. **ITM Web of Conferences**, EDP Sciences, Paris, France, vol. 59, 01004 (2024)
3) P.S. Stanimirović, B. Ivanov, V.N. Katsikis, **S.D. Mourtas**, "*Neutrosophy in Unconstrained Nonlinear Optimization*". In: P.S. Stanimirović, A.A. Stupina, E. Semenkin, I.V. Kovalev (eds) Proceedings of International

Workshop “Hybrid Methods of Modeling and Optimization in Complex Systems”, November 22-24, 2022, Krasnoyarsk, the Russian Federation. **European Proceedings of Computers and Technology**, European Publisher, London, UK, vol. 1, 131-193 (2023)

4) **S.D. Mourtas**, P.S. Stanimirović, V.N. Katsikis, “*A Neutrosophic Adaptive Recurrent Neural Network for Time-Varying Matrix Inversion*”. In: P.S. Stanimirović, A.A. Stupina, E. Semenkin, I.V. Kovalev (eds) Proceedings of International Workshop “Hybrid Methods of Modeling and Optimization in Complex Systems”, November 22-24, 2022, Krasnoyarsk, the Russian Federation. **European Proceedings of Computers and Technology**, European Publisher, London, UK, vol. 1, 249-255 (2023)
5) **S.D. Mourtas**, V.N. Katsikis, R. Sahas, “*Credit Card Attrition Classification Through Neuronets*”. In: P.S. Stanimirović, A.A. Stupina, E. Semenkin, I.V. Kovalev (eds) Proceedings of International Workshop “Hybrid Methods of Modeling and Optimization in Complex Systems”, November 22-24, 2022, Krasnoyarsk, the Russian Federation. **European Proceedings of Computers and Technology**, European Publisher, London, UK, vol. 1, 86-93 (2023)

Scholarships / Grants / Awards

Acquisition of academic experience for young scientists grant
ESPA 2021-2027
Scientific field: Applied Operational Research
2024

Research project grant
Study of the topic “Hybrid Methods of Modelling and Optimization in Complex Systems”
2022-2024

Research project grant
Study of the topics “A Weights Direct Determination Neural Network for Credit Card Attrition Analysis” and “Hermitian solutions of the quaternion algebraic Riccati equations through zeroing neural networks with application to quadrotor control”
2023 – 2024

International award
Best paper award for the paper entitled "Credit Card Attrition Classification Through Neuronets"
2022

Scholarship
PhD Scholarship “Stavros Tsakirakis”
2021 – 2023

Mobility grant
Erasmus+ 2021-2027
Sending Institution: University of Nis, Serbia, Computer Science Department
2021 – 2022

Research project grant
Study of the topic "Investigating GDP and debt through Kaleckian dynamic models"
2021

RESEARCH PRESENTATIONS

Conference
"Customer churn classification through a weights and structure determination neural network", **HMMOCS-II - Hybrid methods of modeling and optimization in complex systems**, Krasnoyarsk, Russia, 2023

Conference
"Prediction of Staff Attrition using Neural Networks", **HETS - International scientific and practical forum on issues of sustainable development in the transition to a new socio-technological order**, Krasnoyarsk, Russia, 2023

Conference
"Exploiting Markowitz Theory through Zeroing Neural Networks", **ISPC - 4th International Scientific and Practical Conference on "Artificial Intelligence: Technogenic vs Sociality"**, Krasnoyarsk, Russia, 2023

Conference
"Credit Card Attrition Classification Through Neuronets", **IWMMA - 11th International Workshop on Mathematical Models and their Applications**, Krasnoyarsk, Russia, 2022

Lecture
"Introduction to Optimization with Application in Finance", **Institute of Business Process Management**, Siberian Federal University, Krasnoyarsk, Russia, 2022

Conference
"Loan Approval Classification Using a Bio-inspired Neural Network", **IMAEF - 8th International Ioannina Meeting on Applied Economics and Finance**, Kefalonia, Greece, 2022

Webinar
"Portfolio Insurance and Intelligent Algorithms", **Computational Management: Applications of Computational Intelligence in Business Management**, IRNet and IIMT, India, 2020

CERTIFICATES OF COMPETENCY

ECPE - Certificate of Proficiency in English
2018

Web Developer Certificate (National and Kapodistrian University of Athens)
2017

Diploma in Counterpoint
2013

Diploma in Harmony
2011

Technical Computer Networks Certificate (Key-CERT IT Specialist)
2008

CERTIFICATES OF ATTENDANCE

AUEB's 16th Summer School on Risk Finance and Stochastics
2019

Attica Bank Innovation Days
2019

AUEB's 15th Summer School in Stochastic Finance
2018

TECHNICAL SKILLS

Programming: Fortran, C/C++, Prolog, Java, SQL, CSS, Html, Php, AJAX, JQUERY, Javascript, Python, Matlab, VBA

Machine Learning: Deep Learning for Time Series Forecasting, Optimization Problems, Regression, Classification

Neural Networks: Matlab Neural Network Toolbox, Tensorflow, Tensorflowjs, GNN, ZNN, WASD

Excellent use of Eviews, SPSS, SAS, Latex, MS Office, CMS, Adobe Dreamweaver, Adobe InDesign, Adobe Photoshop

LANGUAGES

Greek (Native)
English (Fluent)