Prof. ÖMÜR UĞUR

Personal Information

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International Researcher IDs

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ScopusID: 23994756900
Yoksis Researcher ID: 163736

Biography

Ömür Uğur was born in İstanbul, Turkey, on 8th March, 1971. After completing his elementary and secondary education he was accepted to Uluğbey (Private) High School with scholarship from İstanbul Eğitim ve Kültür (İSTEK) Vakfı.

He started his undergraduate studies at the Department of Mathematics, Middle East Technical University (METU) in 1991 and took his B.S. degree in 1995. At the same time he completed courses in Physics Minor Programme. He became a research assistant at the Department of Mathematics, METU, in the same year, and started his graduate studies. He received his M.Sc. degree in Mathematics in 1998, with a thesis entitled "Hypervirial Analysis of Enclosed Quantum Mechanical Systems", and published his first international article "An Eigenfunction Expansion for the Schrödinger Equation with Arbitrary Non-Central Potentials" in the Journal of Mathematical Chemistry, Vol. 32, No. 4, 2002.

He received his Ph.D. degree in Mathematics, with a thesis entitled "Boundary Value Problems for Higher Order Linear Impulsive Differential Equations", in 2003. After working as a part-time instructor at the Department of Mathematics, METU, for half a year, he received a post-doc position at the Institute of Applied Mathematics (IAM), METU. His first international book "An Introduction to Computational Finance" was published by the Imperial College Press in December 2008.

Presently, he is a member of the faculty at IAM, METU.

Education Information

Doctorate, Middle East Technical University, Graduate School of Natural and Applied Sciences, Matematik (Dr), Turkey 1998 - 2003
Postgraduate, Middle East Technical University, Graduate School of Natural and Applied Sciences, Matematik (Yl) (Tezli), Turkey 1995 - 1998
Undergraduate, Middle East Technical University, Faculty of Arts and Sciences, Department of Mathematics, Turkey 1991 - 1995

Research Areas

Mathematics, Differential Equations, Functional Equations, Statistics, Probability Theory, Stochastic Processes, Optimization, Numerical Analysis, Natural Sciences

Academic Titles / Tasks

Professor, Middle East Technical University, Institute of Applied Mathematics, Scientific Computing, 2017 - Continues
Associate Professor, Middle East Technical University, Institute of Applied Mathematics, Scientific Computing, 2011 - 2017

Academic and Administrative Experience

Director of The Institution, Middle East Technical University, Institute of Applied Mathematics, 2017 - 2020
Middle East Technical University, Institute of Applied Mathematics, Scientific Computing, 2015 - 2017
Middle East Technical University, Institute of Applied Mathematics, Financial Mathematics, 2011 - 2017

Advising Theses

Uğur Ö., Option Pricing Under Delay Effect, Doctorate, E.EZGİ(Student), 2024
Uğur Ö., Option pricing via reinforcement learning: Extensions and further ınsights on the QLBS model, Doctorate, A.UMUR(Student), 2023
Uğur Ö., Deep ensembles approach for energy forecasting, Doctorate, O.ENGİNAR(Student), 2023
UĞUR Ö., Data-driven model discovery and control of lateral-directional fighter aircraft dynamics, Postgraduate, C.ÖZNURLU(Student), 2022
UĞUR Ö., EYİ S., Loose coupling of SU2 multiphysics code with pato to analyze the surface recession effect on surface heat flux, Postgraduate, M.ÇELİK(Student), 2022
UĞUR Ö., Performance of electrical power flow solvers: Case studies, Postgraduate, Ö.ADA(Student), 2022
UĞUR Ö., Quality enhancement of computed tomography images of porous media using convolutional neural networks, Postgraduate, E.UMUT(Student), 2022
UĞUR Ö., Analytical pricing formula under three-state regime-switching model, Doctorate, Ö.TEKİN(Student), 2022
UĞUR Ö., Stabilized finite element simulations of multispecies inviscid hypersonic flows in thermochemical nonequilibrium, Doctorate, S.CENGİZCİ(Student), 2022
UĞUR Ö., Seismic first arrival traveltime inversion harnessing physics informed neural networks, Postgraduate, İ.EREN(Student), 2022
UĞUR Ö., Bipedal robot walking by reinforcement learning inpartially observed environment, Postgraduate, U.ÖZALP(Student), 2021
UĞUR Ö., A data driven epidemic model to analyze and forecast thedynamics of COVID-19, Postgraduate, R.HASANLI(Student), 2021
UĞUR Ö., Hybrid wavelet-neural network models for time series data, Doctorate, D.KENAN(Student), 2021
UĞUR Ö., PURUTÇUOĞLU GAZİ V., Extension of leap condition in approximate stochastic simulationalgorithms of biological networks, Postgraduate, S.DEMİRBÜKEN(Student), 2021
UĞUR Ö., Optimal market making models in high-frequency trading, Doctorate, B.AYDOĞAN(Student), 2021
UĞUR Ö., YOZGATLIGİL C., Performance of hybrid machine learning algorithms on financial time series data, Postgraduate, M.GÖZDE(Student), 2021
Uğur Ö., Modeling fx options in presence of stochastic volatility with overnight-indexed-discounting, Postgraduate, S.TEKTEN(Student), 2020
Kestel S. A., Uğur Ö., Comparison of machine learning algorithms on consumer credit classification, Postgraduate, O.KOÇ(Student), 2019
UĞUR Ö., Stochastic modeling of biochemical systems with filtering and smoothing, Postgraduate, M.Haksever(Student),

2019
UĞUR Ö., Modeling fx options in presence of stochastic volatility with overnight-indexed-swap-discounting, Postgraduate, S.Tekten(Student), 2019
UĞUR Ö., Sentiment analysis with recurrent neural networks on turkish reviews domain, Postgraduate, D.Rysbek(Student), 2019
UĞUR Ö., An affine term structure model for Turkish interest rate swap market: do swaps span volatility risk?, Postgraduate, A.Genca(Student), 2019
YÜCEL H., UĞUR Ö., Numerical studies of korteweg-de vries equation with random input data, Postgraduate, M.ALP(Student), 2018
UĞUR Ö., Volatility indexes and an implementation of the Turkish BIST 30 index, Postgraduate, C.KARAKURT(Student), 2018
UĞUR Ö., Uncertainty quantification of parameters in local volatility model via frequentist, Bayesian and stochastic Galerkin methods, Doctorate, A.ADINOYI(Student), 2018
KESTEL S. A., UĞUR Ö., Efficient Simulation and Modelling of Counterparty Credit Risk, Doctorate, A.ALİ(Student), 2018
UĞUR Ö., Pricing Spread And Basket Options Under Markov-Modulated Models, Doctorate, S.KOZPINAR(Student), 2018
UĞUR Ö., Optimal control in fluid flow problems with pod applications to FEM solutions, Doctorate, C.EVCİN(Student), 2018
KESTEL S. A., UĞUR Ö., Stochastic surplus processes with VaR and CVaR simulations in actuarial applications, Postgraduate, M.ŞİMŞEK(Student), 2016
UĞUR Ö., Object-oriented implementation of option pricing via Matlab: Monte Carlo approach, Postgraduate, Ö.TEKİN(Student), 2015
UĞUR Ö., Multiresolution analysis of S&P500 time series, Postgraduate, D.KENAN(Student), 2015
UĞUR Ö., Simulating stochastic differential equations using ito-taylor schemes, Postgraduate, E.BAYLAN(Student), 2014
UĞUR Ö., Computational methods for pricing American options, Postgraduate, B.AYDOĞAN(Student), 2014
UĞUR Ö., Modelling and implementation of local volatility surfaces, Postgraduate, A.ANIMOKU(Student), 2014
UĞUR Ö., Optimal portfolio strategies under various risk measures, Postgraduate, A.MERAL(Student), 2013
UĞUR Ö., Analysis of threshold dynamics of epidemic models in a periodic environment, Postgraduate, C.EVCİN(Student), 2013
UĞUR Ö., Stochastic credit default swap pricing, Postgraduate, İ.HAKKI(Student), 2012
UĞUR Ö., Risk measurement, management and option pricing via a new log-normal sum approximation method, Doctorate, S.ZEYTUN(Student), 2012
UĞUR Ö., An extension to the variational iteration method for systems and higher-order differential equations, Doctorate, D.ALTINTAN(Student), 2011
UĞUR Ö., Pricing and hedging of constant proportion debt obligations, Doctorate, A.İŞCANOĞLU(Student), 2011
KARASÖZEN B., UĞUR Ö., Derivative free multilevel optimization methods, Postgraduate, B.PEKMEN(Student), 2009
UĞUR Ö., An empirical comparison of interest rate models for pricing zero coupon bond options, Postgraduate, H.ŞENTÜRK(Student), 2008
UĞUR Ö., Credit risk modeling and credit default swap pricing under Variance Gamma process, Postgraduate, H.ANAR(Student), 2008

Published journal articles indexed by SCI, SSCI, and AHCI

I. **SUPG-based stabilized finite element computations of convection-dominated 3D elliptic PDEs using shock-capturing**
   Cengizci S., UĞUR Ö., Natesan S.
   Journal of Computational and Applied Mathematics, vol.451, 2024 (SCI-Expanded)
II. **A computational study for simulating MHD duct flows at high Hartmann numbers using a stabilized finite element formulation with shock-capturing**
   Cengizci S., UĞUR Ö.
   Journal of Computational Science, vol.81, 2024 (SCI-Expanded)

III. **A stabilized finite element formulation with shock-capturing for solving advection-dominated convection–diffusion equations having time-fractional derivatives**
Cengizci S., UĞUR Ö., Natesan S.
Journal of Computational Science, vol.76, 2024 (SCI-Expanded)

IV. **A Computational Study for Pricing European- and American-Type Options Under Heston's Stochastic Volatility Model: Application of the SUPG-YZβ Formulation**
Cengizci S., UĞUR Ö.
Computational Economics, 2024 (SCI-Expanded)

V. **Optimal placement of the multiple magnetic sources for the MHD flow in a rectangular duct**
Evcin C., Uğur Ö., Tezer M.
Optimization and Engineering, vol.24, no.4, pp.2855-2885, 2023 (SCI-Expanded)

VI. **Hybrid wavelet-neural network models for time series**
Kılıç D. K., Uğur Ö.
APPLIED SOFT COMPUTING, vol.144, 2023 (SCI-Expanded)

VII. **A SUPG formulation augmented with shock-capturing for solving convection-dominated reaction-convection-diffusion equations**
Cengizci S., UĞUR Ö., Natesan S.
COMPUTATIONAL & APPLIED MATHEMATICS, vol.42, no.5, 2023 (SCI-Expanded)

VIII. **SUPG formulation augmented with YZ beta shock-capturing for computing shallow-water equations**
Cengizci S., Ugur O.
ZAMM-ZEITSCHRIFT FUR ANGEWANDTE MATHEMATIK UND MECHANIK, vol.103, no.6, 2023 (SCI-Expanded)

IX. **Optimal Limit Order Book Trading Strategies with Stochastic Volatility in the Underlying Asset**
Aydoğan B., UĞUR Ö., Aksoy Ü.
Computational Economics, vol.62, no.1, pp.289-324, 2023 (SCI-Expanded)

X. **The impact of simultaneous shocks to financial markets and mortality on pension buy-out prices**
Arik A., Ugur Ö., Kleinow T.
ASTIN BULLETIN-THE JOURNAL OF THE INTERNATIONAL ACTUARIAL ASSOCIATION, vol.53, pp.392-417, 2023 (SCI-Expanded)

XI. **A stabilized FEM formulation with discontinuity-capturing for solving Burgers'-type equations at high Reynolds numbers**
Cengizci S., UĞUR Ö.
Applied Mathematics and Computation, vol.442, 2023 (SCI-Expanded)

XII. **SUPG-YZ beta computation of chemically reactive convection-dominated nonlinear models**
Cengizci S., UĞUR Ö., Natesan S.
INTERNATIONAL JOURNAL OF COMPUTER MATHEMATICS, vol.100, no.2, pp.283-303, 2023 (SCI-Expanded)

XIII. **Time varying control of magnetohydrodynamic duct flow**
Evcin C., UĞUR Ö., Tezer-Sezgin M.
European Journal of Mechanics, B/Fluids, vol.89, pp.100-114, 2021 (SCI-Expanded)

XIV. **A mathematical model for human-to-human transmission of COVID-19: a case study for Turkey's data**
Cengizci S., Cengizci A. D., Uğur Ö.
MATHEMATICAL BIOSCIENCES AND ENGINEERING, vol.18, no.6, pp.9787-9805, 2021 (SCI-Expanded)

XV. **Controlling the Power-Law Fluid Flow and Heat Transfer Under the External Magnetic Field Using the Flow Index and the Hartmann Number**
Evcin C., UĞUR Ö., Tezer-Sezgin M.
INTERNATIONAL JOURNAL OF COMPUTATIONAL METHODS, vol.17, no.3, 2020 (SCI-Expanded)

XVI. **Determining the optimal parameters for the MHD flow and heat transfer with variable viscosity and Hall effect**
Evcin C., Uğur Ö., Tezer-Sezgin M.
COMPUTERS & MATHEMATICS WITH APPLICATIONS, vol.76, pp.1338-1355, 2018 (SCI-Expanded)

XVII. **Impulsive Expressions in Stochastic Simulation Algorithms**

Altintan D., Purutcuoglu V., Uğur Ö.
INTERNATIONAL JOURNAL OF COMPUTATIONAL METHODS, vol.15, no.1, 2018 (SCI-Expanded)

XVIII. **Pricing pension buy-outs under stochastic interest and mortality rates**
ARIK A., Yolcu-Okur Y., ŞAHİN Ş., UĞUR Ö.
SCANDINAVIAN ACTUARIAL JOURNAL, no.3, pp.173-190, 2018 (SCI-Expanded)

XIX. **Multiresolution analysis of S&P500 time series**
KILIC D. K., UĞUR Ö.
ANNALS OF OPERATIONS RESEARCH, vol.260, pp.197-216, 2018 (SCI-Expanded)

XX. **On the methods of pricing American options: case study**
AYDOGAN B., Aksoy U., UĞUR Ö.
ANNALS OF OPERATIONS RESEARCH, vol.260, pp.79-94, 2018 (SCI-Expanded)

XXI. **Pricing formulae for constant proportion debt obligation notes: The Laplace transform technique**
Cekic A. I., UĞUR Ö.
JOURNAL OF COMPUTATIONAL AND APPLIED MATHEMATICS, vol.259, pp.362-370, 2014 (SCI-Expanded)

XXII. **Solution of initial and boundary value problems by the variational iteration method**
Altintan D., UĞUR Ö.
JOURNAL OF COMPUTATIONAL AND APPLIED MATHEMATICS, vol.259, pp.790-797, 2014 (SCI-Expanded)

XXIII. **On the single name CDS price under structural modeling**
GOKGOZ I. H., UĞUR Ö., Okur Y. Y.
JOURNAL OF COMPUTATIONAL AND APPLIED MATHEMATICS, vol.259, pp.406-412, 2014 (SCI-Expanded)

XXIV. **Generalisation of the Lagrange multipliers for variational iterations applied to systems of differential equations**
ALTINTAN D., UĞUR Ö.
MATHEMATICAL AND COMPUTER MODELLING, vol.54, pp.2040-2050, 2011 (SCI-Expanded)

XXV. **Variational iteration method for Sturm-Liouville differential equations**
ALTINTAN D., UĞUR Ö.
COMPUTERS & MATHEMATICS WITH APPLICATIONS, vol.58, no.2, pp.322-328, 2009 (SCI-Expanded)

XXVI. **On optimization, dynamics and uncertainty: A tutorial for gene-environment networks**
WEBER G. -., UĞUR Ö., Taylan P., TEZEL A.
DISCRETE APPLIED MATHEMATICS, vol.157, no.10, pp.2494-2513, 2009 (SCI-Expanded)

XXVII. **An algorithmic approach to analyse genetic networks and biological energy production: an introduction and contribution where OR meets biology**
UĞUR Ö., PICKL S. W., WEBER G. -., WUENSCHIERS R.
OPTIMIZATION, vol.58, no.1, pp.1-22, 2009 (SCI-Expanded)

XXVIII. **Derivative free optimization methods for optimizing stirrer configurations**
UĞUR Ö., Karasoezen B., SCHAEFER M., YAPICI K.
EUROPEAN JOURNAL OF OPERATIONAL RESEARCH, vol.191, no.3, pp.855-863, 2008 (SCI-Expanded)

XXIX. **Optimization and dynamics of gene-environment networks with intervals**
Ugur O., Weber G. W.
JOURNAL OF INDUSTRIAL AND MANAGEMENT OPTIMIZATION, vol.3, no.2, pp.357-379, 2007 (SCI-Expanded)

XXX. **Boundary value problems for higher order linear impulsive differential equations**
Ugur O., AKHMET M.
JOURNAL OF MATHEMATICAL ANALYSIS AND APPLICATIONS, vol.319, no.1, pp.139-156, 2006 (SCI-Expanded)

XXXI. **The Sturm-Liouville operator on the space of functions with discontinuity conditions**
Ugur O., Akhmet M.
COMPUTERS & MATHEMATICS WITH APPLICATIONS, vol.51, no.6-7, pp.889-896, 2006 (SCI-Expanded)

XXXII. **Numerical method for optimizing stirrer configurations**
Schafer M., KARASOZEN B., ULUDAĞ Y., YAPICI K., Ugur O.
COMPUTERS & CHEMICAL ENGINEERING, vol.30, no.2, pp.183-190, 2005 (SCI-Expanded)

XXXIII. **An eigenfunction expansion for the Schrodinger equation with arbitrary non-central potentials**
TASELI H., Erhan I., Ugur O.

JOURNAL OF MATHEMATICAL CHEMISTRY, vol.32, no.4, pp.323-338, 2002 (SCI-Expanded)

Articles Published in Other Journals

I. **A COMPARATIVE AND ILLUSTRATIVE STUDY FOR SOLVING SINGULARLY PERTURBED PROBLEMS WITH TWO PARAMETERS**
CEngizci S., UĞUR Ö.
Turkish World Mathematical Society Journal of Applied and Engineering Mathematics, vol.14, no.2, pp.520-536, 2024 (ESCI)

II. **The Impact of Feature Selection and Transformation on Machine Learning Methods in Determining the Credit Scoring**
Koç O., Uğur Ö., Kestel A. S.
arXiv, vol.2303, no.5427, pp.2-14, 2023 (Non Peer-Reviewed Journal)

III. **Modeling and implementation of local volatility surfaces in Bayesian framework**
Animoku A., UĞUR Ö., Yolcu-Okur Y.
COMPUTATIONAL MANAGEMENT SCIENCE, vol.15, no.2, pp.239-258, 2018 (ESCI)

Books & Book Chapters

I. **An Introduction to Computational Finance**
Uğur Ö.
Imperial College Press , Singapore, 2009

Refereed Congress / Symposium Publications in Proceedings

I. **Data-Driven Model Discovery and Control: Real-Time Implementation to Highly Maneuverable Aircraft Lateral-Directional Dynamics**
Oznurlu C., Bayri B., UĞUR Ö.
10th International Conference on Recent Advances in Air and Space Technologies, RAST 2023, İstanbul, Turkey, 7 - 09 June 2023

II. **Numerical Modeling of Hypersonic Air and Carbon Dioxide Flows in Thermochemical Non-Equilibrium with SU2-NEMO Solver**
Çelik M., Uğur Ö., Eyi S.
The 2nd International Conference on Flight Vehicles, Aerothermodynamics and Re-entry Missions Engineering (FAR), Heilbronn, Germany, 19 - 23 June 2022, pp.1-6

III. **Multi-fidelity aerodynamic dataset generation of a fighter aircraft**
Kurt H. B., Millidere M., Gomec F. S., Uğur Ö.
AIAA Science and Technology Forum and Exposition, AIAA SciTech Forum 2021, Virtual, Online, 11 - 15 January 2021, pp.1-28

IV. **Kalman based neural network analysis with resampling methods for longitudinal aerodynamic coefficient estimation**
Millidere M., Kurt H. B., Balli H., Uğur Ö.
AIAA AVIATION 2020 FORUM, Virtual, Online, 15 - 19 June 2020, pp.1-25

V. **Derivative free optimization of stirrer configurations**
Schaefer M., KARASÖZEN B., UĞUR Ö., Yapici K.
6th European Conference on Numberical Mathematics and Advanced Applications (ENUMATH2005), Santiago de Compostela, Spain, 01 July 2005, pp.1031-1033

Supported Projects

PURUTÇUOĞLU V., ERKUŞ E. C., KÖSTEKCİ S. M., UĞUR Ö., ŞENOĞLU B., ALTINTAN D., Project Supported by Higher Education Institutions, Protein protein etkileşim ağlarında yaklaşık stokastik simülasyon algoritmaları, 2020 - 2023
UĞUR Ö., TEKİN Ö., ALADAĞLI E. E., AYDOĞAN B., ENGİNAR O., Project Supported by Higher Education Institutions, Algoritmik Ticaret ve Finansal Araçlar için Gerçek Zamanlı Çalışan Bir Prototip, 2018 - 2019
KESTEL A. S., AKSU M., KOÇ O., UĞUR Ö., Project Supported by Higher Education Institutions, Bankacılık sektöründe gözetimli öğrenme yaklaşımları kullanılarak kredi riskinin belirlenmesi, 2018 - 2019
UĞUR Ö., TEKİN Ö., EVCİN C., Project Supported by Higher Education Institutions, Türev Araçların Lévy Modeli Altında Monte Carlo Benzetimi ile Fiyatlandırılması, 2017 - 2017
UĞUR Ö., KALAYCI B., ONAK Ö. N., KARIMOV A., ÖZ H., AKDOĞAN E., Project Supported by Higher Education Institutions, Finansal, Ekonomik ve Bilimsel Süreçlere Ait Sıçramalı Stokastik Hibrit Sistemler: Optimal Kontrol ve Optimizasyon, 2017 - 2017
UĞUR Ö., KESTEL S. A., ŞİMŞEK M., Project Supported by Higher Education Institutions, Monte Carlo simülasyon teknikleri ile iflas olasılıklarının tahmininde CVaR optimizasyonu, 2016 - 2016
UĞUR Ö., TEKİN Ö., EVCİN C., ÜRETEN M. A., Project Supported by Higher Education Institutions, Navier-Stokes Denklemleri için Kontrol Problemleri ve Uygulamaları, 2016 - 2016
PURUTÇUOĞLU V., Tuncer G., SÜRÜN B., Yazıcı M., AYDIN SON Y., UĞUR Ö., Project Supported by Higher Education Institutions, Biyokimyasal sistemlerin stokastik simülasyon algoritmalarıyla yaratılması ve impuls içerecek şekilde genişletilmesi, 2014 - 2016
UĞUR Ö., EVCİN C., KILIÇ D. K., Project Supported by Higher Education Institutions, Adveksiyon- ve Reaksiyon-Difuzyon Sistemleri için Optimal Kontrol ve Parametre Tahmin Yöntemleri, 2015 - 2015
YOLCU OKUR Y., UĞUR Ö., KOZPINAR S., ANIMOKU A. A., Project Supported by Higher Education Institutions, Sıçramalı Difüzyon Süreçleri Varsayımı Altında Bariyer Opsiyonlarının Fiyatlandırılması, 2015 - 2015
UĞUR Ö., TEKİN Ö., YOLCU OKUR Y., Project Supported by Higher Education Institutions, Türev Araçların Lévy Modeli Altında Monte Carlo Benzetimi ile Fiyatlandırılması, 2015 - 2015

Scientific Refereeing

OPTIMIZATION, SCI Journal, November 2023
JOURNAL OF DYNAMICS AND GAMES, SCI Journal, August 2023
NUMERICAL ALGEBRA, CONTROL AND OPTIMIZATION, SCI Journal, July 2023
OPTIMIZATION, SCI Journal, June 2023
NUMERICAL ALGEBRA, CONTROL AND OPTIMIZATION, SCI Journal, April 2023
JOURNAL OF INDUSTRIAL AND MANAGEMENT OPTIMIZATION, SCI Journal, March 2023

Metrics

Publication: 63
Citation (WoS): 207
Citation (Scopus): 269
H-Index (WoS): 10
H-Index (Scopus): 10

Non Academic Experience

METU, Institute of Applied Mathematics
METU, Department of Mathematics