1. Record Nr. UNINA9910866580303321

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Titolo	Perspectives in Dynamical Systems II — Numerical and Analytical Approaches : DSTA, ód, Poland December 6–9, 2021 / / edited by Jan Awrejcewicz
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2024
ISBN	9783031564963 3031564960
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (800 pages)
Collana	Springer Proceedings in Mathematics & Statistics, , 2194-1017 ; ; 454
Disciplina	515.39
Soggetti	Dynamics Mathematical models Differential equations Numerical analysis Dynamical Systems Mathematical Modeling and Industrial Mathematics Differential Equations Numerical Analysis Sistemes dinàmics diferenciables Congressos Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Modeling and analyzing a spring pendulum motion in the presence of energy harvesting devices (Abohamer, M., Awrejcewicz, J., Starosta, R., Amer, T., Bek, M. A.) -- Asymptotic Solutions of the Boundary Value Problem of Convective Diffusion around Drops with Volumetric Nonlinear Chemical Reaction (Akhmetov, R.) -- Mathematical model of double row self-aligning ball bearing (Ambrokiewicz, B., Litak, G., Georgiadis, A., Syta, A., Meier, N., Gassner, A.) -- Dynamics of railway wheelsets with a nonsmooth contact force model (Antali, M.) -- Studies of the interaction dynamics in albumin - chondroitin sulfate systems by

recurrence method (Bedowski, P., Weber, P., Gadomski, A., Sionkowski, P., Kruszewska, N., Domino, K.) -- Dynamic Integrity of Hyperelastic Spherical Membranes (Benedetti, K., Silva, F., Soares, R., Gonçalves, P.) -- Nonstationary stochastic analysis of fractional viscoelastic Euler-Bernoulli beams (Burlon, A., Di Paola, M., Sucato, V.) -- Zermelo Navigation Problem with State Constraints (Smirnova, N., Malykh, E., Cherkasov, O.) -- About the attacker-defender-target optimal problem (Cherkasov, O. Y., Malykh, E. V., Makieva, E. I.) -- The Symbolic Description of Feedbacks in Nonlinear Control Problems with a Parameter Using Approximation Theory Methods (Danik, Y., Dmitriev, M.) -- The Symbolic Description of Feedbacks in Nonlinear Control Problems with a Parameter Using Approximation Theory Methods (Danik, Y., Dmitriev, M.) -- Deficient RC slabs strengthened with combined FRP layer and high-performance fiber-reinforced cementitious composite (Ebadi-Jamkhaneh, M., Ahmadi, M., Kontoni, D. -P. N.) -- On alphabetical shaped soliton for intrinsic fractional coupled nonlinear electrical transmission lattice using sine-cosine method (Fendzi-Donfack, E., Nkouessi, N. T., Tala-Tebue, E., Kenfack-Jiotsa, A.) -- The effect of damping on the energy transfer in the spherical pendulum with fractional damping in a pivot point (Freundlich, J., Sado, D.) -- Lyapunov Functionsby interpolating numerical quadratures: Proof of Convergence (Giesl, P., Hafstein, S.) -- Proposal of a control hardware architecture for implementation of fractional-order controllers (Gude, J. J., Bringas, P. G.) -- Influence of periodic nutrient advection on a simple ecosystem (Jaillet, A., Riviere, P., Carton, X.) -- The effect of initial stress on nonlinear lateral vibrations of rotating rods (Khajiyeva, L., Kudaibergenov, A., Kudaibergenov, A., Umbetkulova, A.) -- Optimisation potentials of laminated composites using semi-analytical vibro-acoustic models (Klaerner, M., Binsilm, S., Marburg, S., Kroll, L. Optimisation) -- Validation of numerical models describing the stress-strain characteristics in the strength tests of composite materials on a metal matrix using the elasto-optic method (Kurzawa, A., Pyka, D., Bocian, M., Jankowski, L., Bajkowski, M., Jamroziak, K.) -- Forced vibrations in a dynamic system equipped with a mechanism that trans-pass through its singular position (Lipinski, K.) -- Spectral analysis of chimney vibrations (Machado, M., Dutkiewicz, M.) -- Non-smooth dynamics in ramp-controlled and sine-controlled Buck converters (Bastidas, J. D. M., Cataño, J. G. M., Tost, G. O.) -- Discovery and Online Interactive Representation of the Dimensionless Parameter-Space of the Spring-Loaded Inverted Pendulum Model of Legged Locomotion Using Surface Interpolation (Nagy, Á. M., Patkó, D., Zelei, A.). - Chaos and Fractal-based information hiding techniques as applied to Steganography (Ntaoulas, N., Drakopoulos, V.) -- Analysis of practical application aspects for an active control strategy to Civil Engineering structures (Paulet-Crainiceanu, F., Florea, V., Luca, S. G., Pastia, C., Rosca, O. V.) -- Nonlinear Dynamic Model of the Oculo-Motor System Human based on the Volterra Series (Pavlenko, V., Shamanina, T., Chori, V.) -- Dynamics of energy harvesting mechanical system in the vicinity of 1:1 resonance (Puzyrov, V., Awrejcewicz, J., Losyeva, N.) -- Estimation the domain of attraction for a system of two coupled oscillators with weak damping (Puzyrov, V., Awrejcewicz, J., Losyeva, N., Savchenko, N., Nikolaieva, O.) -- Super-twisting sliding mode control for a formation of fully-actuated multirotor aerial vehicles (Ricardo Jr, J. A., Santos, D. A.) -- Parameter identification for a two-axis gimbal system and its kinematic calibration (Rówienicz, ., Malczyk, P.) -- A multi-agent computer program for automatic investigation the behaviour of a nonlinear dynamic system in real-time (Ruchkin, C., Ruchkin, A.) -- Asymptotic approach to motion of

physical pendulum with an extended model of damping (Salamon, R., Sypniewska-Kamiska, G., Kamiski, H.) -- Vibration characterization of a tubular chemical reactor (Santos, J., Machado, M., Vernieres-Hassimi, L., Khalij, L.) -- Dynamics of a multiple-link aerodynamic pendulum (Selyutskiy, Y., Holub, A., Lin, C. H.) -- A method to improve the accuracy of bridge cranes overload protection using the signal graph. (Semenyuk, V., Lingur, V., Martsenyuk, V., Kazakova, N., Punchenko, N., Faat, P., Warwas, K.) -- Shock Torsion Wave in an Elastic Rod with Decreasing Function of Viscoplastic External Friction (Shatskyi, I., Perepichka, V.) -- Effect of porosity on free vibration of FG shallow shells with complex planform (Shmatko, T.) -- Brachistochrone problem with state constraints of a certain type (Smirnova, N., Cherkasov, O.) -- Evaluation of forces in dynamically loaded journal bearings using feedforward neural networks (Smolík, L., Rendl, J., Bulín, R.) -- Time-variable normal contact force influence on dry-friction damping of self-excited vibration of bladed turbine wheel (Snabl, P., Pesek, L., Prasad, C. P.) -- Coupled system of stochastic neural networks with impulses, Markovian switching, and node and connection delays (Tojtovska, B., Ribarski, P.) -- Bifurcations in inertial focusing of particles in curved ducts (Valani, R., Harding, B., Stokes, Y.) -- Strategies for amplitude control in a ring of self-excited oscillators (Vinod V., Balaram B.) -- Statistical method for analysis of interactions between chosen protein and chondroitin sulfate in an aqueous environment (Weber, P., Bedowski, P., Gadomski, A., Domino, K., Sionkowski, P., Ledziski, D.) -- Development of a cardiovascular mathematical model considering the thermal environment. (Xia, Z., Ishikawa, Y., Kaneko, S., Kusaka, J.) -- On the attitude stabilization of artificial Earth satellite in the natural electromagnetic coordinate system (Aleksandrov, A. Y., Tikhonov, A. A.) -- Influence of fractional order parameter on the dynamics of different vibrating systems (Zafar, A. A., Awrejcewicz, J.) -- Method of inversion of Laplace transform in some problems of dynamic elasticity (Zhuravlova, Z.).

Sommario/riassunto

This proceedings volume gathers selected, peer-reviewed papers presented at the Dynamical Systems Theory and Applications International Conference - DSTA 2021, held virtually on December 6-9, 2021, organized by the Department of Automation, Biomechanics, and Mechatronics at Lodz University of Technology, Poland. This volume focuses on numerical and analytical approaches, while Volume I concentrates on studies on applications. Being a truly international conference, this 16th iteration of DSTA received submissions from authors representing 52 countries. The program covered both theoretical and experimental approaches to widely understood dynamical systems, including topics devoted to bifurcations and chaos, control in dynamical systems, asymptotic methods in nonlinear dynamics, stability of dynamical systems, lumped mass and continuous systems vibrations, original numerical methods of vibration analysis, non-smooth systems, dynamics in life sciences and bioengineering, as well as engineering systems and differential equations. DSTA conferences aim to provide a common platform for exchanging new ideas and results of recent research in scientific and technological advances in modern dynamical systems. Works contained in this volume can appeal to researchers in the field, whether in mathematics or applied sciences, and practitioners in myriad industries.