References

- [1] Design of a new Robot Operating System-MATLAB-based autonomous robot system and trajectory tracking experiment Zhenning Yu, Fengxiang Ge, Seng Fat Wong, 2024.
- [2] Lyapunov functions for fractional order systems ScienceDirect.
- [3] Assmaa Abd-Elmonem, Ramashis Banerjee, Shabir Ahmad, Wasim Jamshed, Kottakkaran Sooppy Nisar, Mohamed R. Eid, Rabha W. Ibrahim, and Sayed M. El Din. A comprehensive review on fractional-order optimal control problem and its solution. 21(1).
- [4] Thabet Abdeljawad. On Riemann and Caputo Fractional Di erences. 62(3):1602 1611.
- [5] Norelys Aguila-Camacho, Manuel A. Duarte-Mermoud, and Javier A. Gallegos. Lyapunov functions for fractional order systems. 19(9):2951 2957.
- [6] Tepljakov Aleksei, Petlenkov Eduard, and Belikov Juri. A Flexible MATLAB Tool for Optimal Fractional-Order PID Controller Design Subject to Speci cations. In Proceedings of the 31st Chinese Control Conference, pages 4698 4703.
- [7] Ahmad Taher Azar, Ahmed G. Radwan, and Sundarapandian Vaidyanathan. Fractional Order Systems: Optimization, Control, Circuit Realizations and Applications. Academic Press.
- [8] Eu-Tteum Baek and Dae-Yeong Im. ROS-Based Unmanned Mobile Robot Platform for Agriculture. 12(9):4335.
- [9] Shaoping Bai and Marco Ceccarelli, editors. Recent Advances in Mechanism Design for Robotics: Proceedings of the 3rd IFToMM Symposium on Mechanism Design for Robotics, volume 33 of Mechanisms and Machine Science. Springer International Publishing.
- [10] Adnane Boukhouima, Khalid Hattaf, El Mehdi Lot , Marouane Mahrouf, Del m F. M. Torres, and Noura Yous . Lyapunov Functions for Fractional-Order Systems in Biology: Methods and Applications. 140:110224.
- [11] Dariusz W. Brzezi ski and Piotr Ostalczyk. The Gr nwald-Letnikov formula and its equivalent Horner's form accuracy comparison and evaluation for application to fractional order PID controllers. In 2012 17th International Conference on Methods & Models in Automation & Robotics (MMAR), pages 579 584.
- [12] Denis Chikurtev. Mobile Robot Simulation and Navigation in ROS and Gazebo. In 2020 International Conference Automatics and Informatics (ICAI), pages 1 6.
- [13] Aisha F. Fareed, Mourad S. Semary, and Hany N. Hassan. An approximate solution of fractional order Riccati equations based on controlled Picard's method with Atangana Baleanu fractional derivative. 61(5):3673 3678.
- [14] Muhammad Farman, Rabia Sarwar, and Ali Akgul. Modeling and Analysis of Sustainable Approach for Dynamics of Infections in Plant Virus with Fractal Fractional Operator. 170:113373.
- [15] Herbert Goldstein, Charles P Poole, and John Safko. Classical Mechanics.
- [16] Ryszard Gonczarek. Teoria Grup w Fizyce. O cyna Wydawnicza Politechniki Wroc awskiej.
- [17] Brian C. Hall. Lie Groups, Lie Algebras, and Representations, volume 222 of Graduate Texts in Mathematics. Springer.
- [18] Alberto Isidori. Nonlinear Control Systems. Communications and Control Engineering. Springer.
- [19] Alberto Isidori. Nonlinear Control Systems II. Communications and Control Engineering. Springer.
- [20] Tadeusz Kaczorek. Selected Problems of Fractional Systems Theory, volume 411 of Lecture Notes in Control and Information Sciences. Springer.
- [21] Tadeusz Kaczorek and Krzysztof Rogowski. Fractional Linear Systems and Electrical Circuits, volume 13 of Studies in Systems, Decision and Control. Springer International Publishing.
- [22] Tadeusz Kaczorek and Krzysztof Rogowski. Positive Fractional Electrical Circuits. In Tadeusz Kaczorek and Krzysztof Rogowski, editors, Fractional Linear Systems and Electrical Circuits, pages 49 80. Springer International Publishing.

- [23] Manisha Kankarej and Jai Pratap Singh. FRACTIONAL FIELD WITH STANDARD FRACTIONAL VECTOR CROSS PRODUCT. VOL 41:811 819.
- [24] Seulbae Kim and Taesoo Kim. RoboFuzz: Fuzzing robotic systems over robot operating system (ROS) for nding correctness bugs. In Proceedings of the 30th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering, pages 447 458. ACM.
- [25] Andrzej Koszewnik. Fast Prototyping Method of the Active Vibration Damping for Mechanical Systems.
- [26] Pushpendra Kumar, Dumitru Baleanu, Vedat Suat Erturk, Mustafa Inc, and V. Govindaraj. A Delayed Plant Disease Model with Caputo Fractional Derivatives. 2022(1):11.
- [27] Hang Li, Yongjun Shen, Yanjun Han, Jinlu Dong, and Jian Li. Determining Lyapunov exponents of fractional-order systems: A general method based on memory principle. 168:113167.
- [28] Zhuo Li, Lu Liu, Sina Dehghan, YangQuan Chen, and Dingyu Xue. A review and evaluation of numerical tools for fractional calculus and fractional order control. 90.
- [29] Daniel Liberzon. Switching in Systems and Control. Systems & Control: Foundations & Applications. Birkh user.
- [30] Hai Lin and Panos J. Antsaklis. Stability and Stabilizability of Switched Linear Systems: A Survey of Recent Results. 54(2):308 322.
- [31] Steve Macenski, Tom Moore, David V. Lu, Alexey Merzlyakov, and Michael Ferguson. From the desks of ROS maintainers: A survey of modern & capable mobile robotics algorithms in the robot operating system 2. 168:104493.
- [32] Agnieszka B. Malinowska, Tatiana Odzijewicz, and Del m F.M. Torres. Advanced Methods in the Fractional Calculus of Variations. SpringerBriefs in Applied Sciences and Technology. Springer International Publishing.
- [33] Mariusz Matusiak and Piotr Ostalczyk. Problems in solving fractional di erential equations in a microcontroller implementation of an FOPID controller. 68(3):565 577.
- [34] Daniele Mortari, Roberto Garrappa, and Luigi Nicol . Theory of Functional Connections Extended to Fractional Operators. 11(7):1721.
- [35] Mohamed Naji Muftah, Ahmad Athif Mohd Faudzi, Sha shuhaza Sahlan, and Mokhtar Shouran. Modeling and Fuzzy FOPID Controller Tuned by PSO for Pneumatic Positioning System. 15(10):3757.
- [36] Ewa Piotrowska. Analiza obwod w elektrycznych zawieraj cych elementy opisane pochodn o r nych rz dach nieca kowitych.
- [37] Igor Podlubny. Fractional Di erential Equations: An Introduction to Fractional Derivatives, Fractional Di erential Equations, to Methods of Their Solution and Some of Their Applications. Elsevier.
- [38] Marina Popolizio. On the Matrix Mittag Le er Function: Theoretical Properties and Numerical Computation. 7(12):1140.
- [39] R. Rajesh. Optimal Tuning of FOPID Controller Based on PSO Algorithm with Reference Model for a Single Conical Tank System. 1(7):758.
- [40] Filip Rindler. Calculus of Variations. Universitext. Springer International Publishing.
- [41] Haleh Tajadodi. E cient Technique for Solving Variable Order Fractional Optimal Control Problems. 59(6):5179 5185.
- [42] Aleksei Tepljakov, Baris Baykant Alagoz, Celaleddin Yeroglu, Emmanuel Gonzalez, S. Hassan HosseinNia, and Eduard Petlenkov. FOPID Controllers and Their Industrial Applications: A Survey of Recent Results1. 51(4):25 30.
- [43] Aleksei Tepljakov, Eduard Petlenkov, and Juri Belikov. FOMCON: A MATLAB Toolbox for Fractional-Order System Identi cation and Control. 2:51 62.
- [44] Mustafa Turkyilmazoglu and Mohamed Altanji. Fractional Models of Falling Object with Linear and Quadratic Frictional Forces Considering Caputo Derivative. 166:112980.

- [45] Georgios Tzounas, Ioannis Dassios, Mohammed Ahsan Adib Murad, and Federico Milano. Theory and Implementation of Fractional Order Controllers for Power System Applications. 35(6):4622 4631.
- [46] Andres Vivas and Jos Mar a Sabater. UR5 Robot Manipulation using Matlab/Simulink and ROS. In 2021 IEEE International Conference on Mechatronics and Automation (ICMA), pages 338 343.
- [47] Yue-E Wang, Hamid Reza Karimi, and Di Wu. Conditions for the Stability of Switched Systems Containing Unstable Subsystems. 66(4):617 621.
- [48] Malgorzata Wyrwas, Dorota Mozyrska, and Ewa Girejko. Stability of Discrete Fractional-Order Nonlinear Systems with the Nabla Caputo Di erence. 46(1):167 171.
- [49] Jianwei Zhao, Shengyi Liu, and Jinyu Li. Research and Implementation of Autonomous Navigation for Mobile Robots Based on SLAM Algorithm under ROS. 22(11):4172.
- [50] Cosmin B., Alexandru A., Sorin T.. Controlling industrial robots with Simulink, 15th International Conference on Electronics, Computers and Artificial Intelligence, ECAI 2023 Proceedings (2023).
- [51] Teper H., Bayuwindra A., Riebl R. .AuNa: Modularly Integrated Simulation Framework for Cooperative Autonomous Navigation, 10.48550/arXiv.2207.05544.
- [52] Kazim M., Hong J., Kim M. .Recent advances in path integral control for trajectory optimization: An overview in theoretical and algorithmic perspectives, 10.1016/j.arcontrol.2023.100931.
- [53] Peter Corke, Integrating ROS and MATLAB [ROS Topics], IEEE Robotics & Automation Magazine (Volume: 22, Issue: 2, June 2015), pages 18 20
- [54] Shamshiri R. R.Hameed I. A. . Robotic Harvesting of Fruiting Vegetables: A Simulation Approach in V-REP, ROS and MATLAB, Automation in Agriculture Securing Food Supplies for Future Generations (2018),
- [55] Miura K.Tokunaga S. .Cosam: Co-simulation framework for ros-based self-driving systems and matlab/Simulink, Journal of Information Processing (2021),10.2197/IPSJJIP.29.227
- [56] Vivas A.Sabater J. M. .UR5 Robot Manipulation using Matlab/Simulink and ROS, 2021 IEEE International Conference on Mechatronics and Automation, ICMA 2021 (2021),10.1109/ICMA52036.2021.9512650
- [57] Wong S. F.Yu Z.. A ROS-Matlab road condition prediction algorithm with cost-effectiveness for self-navigating mobile robots. Procedia Manufacturing (2020),10.1016/j.promfg.2020.10.004.
- [58] Avanzato R. L. . Development of a MATLAB/ROS interface to a low-cost robot arm. ASEE Annual Conference and Exposition, Conference Proceedings (2020).
- [59] Miura K., Tokunaga S., Azumi T. . Autoware toolbox: MATLAB/Simulink benchmark suite for ROS-based self-driving software platform. Proceedings of the International Workshop on Rapid System Prototyping (2019).
- [60] Rosillo N., Montés N., Ferreira N. M. F. . A generalized matlab/ROS/robotic platform framework for teaching robotics. Advances in Intelligent Systems and Computing (2020).