

List of Publications of Anton S. Shiriaev (Shiryaev)

A. Original articles in refereed scientific journals

- [J1] Pchelkin S.S., A.S. Shiriaev, A. Robertsson, L.B. Freidovich, S.A. Kolyubin, L.V. Paramonov, and S.V. Gusev. 'On Orbital Stabilization for Industrial Manipulators: Case Study in Evaluating Performances of Modified PD+ and Inverse Dynamics Controllers,' *IEEE Transactions on Control Systems Technology*, 25(1):101-117, 2017. DOI: 10.1109/TCST.2016.2554520

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- [J2] Johansson R., A. Robertsson and A.S. Shiriaev. 'Observer-based strictly positive real (SPR) variable structure output feedback control,' *Journal of the Franklin Institute*, 353(16): 4213-4232, 2016.
- [J3] Pchelkin S.S., A.S. Shiriaev, U. Mettin, L.B. Freidovich, L.V. Paramonov, S.V. Gusev. 'Algorithms for finding gaits of locomotive mechanisms: case studies for Gorilla robot brachiation,' *Autonomous Robots*, 40: 849-865, 2016. DOI 10.1007/s10514-015-9497-1
- [J4] Gusev S.V., A.S. Shiriaev and L.B. Freidovich. 'SDP-based approximation of stabilising solutions for periodic matrix Riccati differential equations,' *International Journal of Control*, 89(7): 1396-1405, 2016. DOI: 10.1080/00207179.2015.1131850

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- [J5] Gusev S.V., Paramonov L.V., Pchelkin S., Robertsson A., L. Freidovich and A. Shiriaev, 'On extension of PD+ regulator for orbital stabilization of fully actuated mechanical system,' *Journal of Applied Mathematics and Mechanics*, 79(6): 778-792, 2015. (in Russian)
- [J6] Morales D., P. La Hera, S. Westerberg, L. Freidovich and A. Shiriaev. 'Path-Constrained Motion Analysis: An Algorithm to Understand Human Performance on Hydraulic Manipulators,' *IEEE Transactions on Human-Machine Systems*, 45(2): 187-195, 2015. DOI: 10.1109/THMS.2014.2366873
- [J7] Pchelkin S., A. Shiriaev, L. Freidovich, U. Mettin, S. Gusev, Woong Kwon, and L. Paramonov. 'A Dynamic Human Motion: Coordination Analysis,' *Journal of Biological Cybernetics*, 109(1): 47-62, 2015. DOI: 10.1007/s00422-014-0624-4

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- [J8] Efimov D., W. Perruquetti and A. Shiriaev. 'On existence of oscillations in hybrid systems,' *Nonlinear Analysis: Hybrid Systems*, 12:104-116, 2014.
- [J9] Shiriaev A.S., L. Freidovich, and M.W. Spong. 'Controlled invariants and trajectory planning for underactuated mechanical systems,' *IEEE Transactions on Automatic Control*, 59(9): 2555-2561, 2014.
- [J10] Ortíz D., S. Westerberg, P.X. La Hera, U. Mettin, L. Freidovich, and A. Shiriaev. 'Increasing the level of automation in the forestry logging process with crane trajectory planning and control,' *Journal of Field Robotics*, 31(3):343-363, 2014. DOI: 10.1002/rob.21496

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- [J11] Shiriaev A.S., L. Freidovich, and M.W. Spong. 'A remark on Controlled Lagrangians approach,' *European Journal of Control*, 19:438-444, 2013. [DOI: 10.1016/j.ejcon.2013.09.004](https://doi.org/10.1016/j.ejcon.2013.09.004)

- [J12] Westerberg S. and A.S. Shiriaev. 'Virtual Environment-Based Teleoperation of Forestry Machines: Designing Future Interaction Methods,' *Journal of Human-Robot Interaction*, 2(3): 84-110, 2013.
- [J13] La Hera P.X., A.S. Shiriaev, L.B. Freidovich, U. Mettin and S.V. Gusev. 'Stable walking gaits for three-link planar biped walker with one actuator,' *IEEE Transactions on Robotics*, 29(3): 589-601, 2013. [10.1109/TRO.2013.2239551](https://doi.org/10.1109/TRO.2013.2239551)
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- [J15] Meza-Sanchez I.M., L.T. Aguilar, A.S. Shiriaev, L.B. Freidovich, and Yu. Orlov. 'Periodic Motion Planning and Nonlinear H-inf-Tracking Control of a 3-DOF Underactuated Helicopter,' *International J. of Systems Science*, 42(5): 829-838, 2011.
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- [J16] Shiriaev A.S., L.B. Freidovich and S.V. Gusev. 'Transverse linearization for controlled mechanical systems with several passive degrees of freedom,' *IEEE Transactions on Automatic Control*, 55(4): 893–906, 2010. DOI: 10.1109/TAC.2010.2042000.
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- [J18] Gusev S., S. Johansson, B. Kågström, A.S. Shiriaev, and A. Varga. 'Numerical evaluation of solvers for the periodic Riccati differential equation,' *BIT Numerical Mathematics*, 50: 301-329, 2010. DOI: 10.1007/s10543-010-0257-5
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- [J20] Mettin U., P. La Hera, L.B. Freidovich, and A.S. Shiriaev. 'Parallel elastic actuators as control tool for preplanned trajectories of under-actuated mechanical systems,' *International Journal of Robotics Research*, 29(9): 1186-1198, 2010. DOI: 10.1177/0278364909344002
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- [J39] Shiriaev A.S. and A.L. Fradkov. 'Stabilization of invariant sets for nonlinear systems with applications to control of oscillations,' *International Journal of Robust and Nonlinear Control*, Vol. 11, pp. 215-240, 2001.

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- [J44] Shiriaev A.S. 'The notion of V-detectability and stabilization of invariant sets of nonlinear systems," *Systems & Control Letters*, 39(5): 327-338, 2000.

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C. Book chapters

- [BC1] Kolyubin S., L. Paramonov and A. Shiriaev. 'Optimising configurations of KUKA LWR4+ manipulator for calibration with optical CMM,' In: *Mechanisms and Machine Science* (Editors: Shaoping Bai, Marco Ceccarelli), Vol. 33, pp. 189-199, 2015.
- [BC2] Freidovich L. and A.S. Shiriaev. 'Transverse linearization for underactuated non-holonomic mechanical systems with application to orbital stabilization,' *Lecture Notes in Control and Information Sciences* (Editors: A. Rantzer and R. Johansson), Vol. 417, pp. 245-258, 2012.
- [BC3] Shiriaev A.S., A. Robertsson, L. Freidovich and R. Johansson. 'Coordinating control for a fleet of underactuated ships.' In: *Group Coordination and Cooperative Control*. K.Y. Pettersen, J.T. Gravdahl and H. Nijmeijer (Eds.), Springer: *Lecture Notes in Control and Information Sciences*, Vol. 336, pp. 233-250, 2006
- [BC4] Vik B., A.S. Shiriaev and T.I. Fossen. 'Nonlinear observer design for integration of DGPS and INS.' In: *New directions in nonlinear observer design*. H. Nijmeijer and T.F. Fossen (Eds.), Springer-Verlag, pp. 137-161, 1999.

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D. Original contributions to refereed scientific conferences

- [C1] Surov M., A.S. Shiriaev, L.B. Freidovich, S.V. Gusev and L.V. Paramonov. 'Case study in non-prehensile manipulation: Planning and orbital stabilization of one-directional rolling for the 'Butterfly' robot,' in *the Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, pp. 1484-1489, 2015.
- [C2] Shiriaev A.S., L.B. Freidovich, A. Robertsson, A. Andersson and R. Johansson. 'Sufficient Conditions for Dynamic Stabilization of 3-State Moore-Greitzer Compressor Model,' in *the Proceedings of the 54th IEEE Conference on Decision and Control (CDC)*, pp. 4394-4399, 2015.
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- [C5] Kolyubin S. and A.S. Shiriaev. 'Dynamics-consistent motion planning for underactuated ships using virtual holonomic constraints,' in *the Proceedings of MTS/IEEE Oceans*, 2014.
- [C6] Kolyubin S. and A.S. Shiriaev. 'Feasibility Analysis and Controller Design for Underactuated Ship Maneuvering: 4 DOF Case,' in *the Proceedings of Royal Institution of Naval Architects - 10th Symposium on High Speed Marine Vehicles, HSMV, Naples*, 2014.

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- [C7] Shiriaev A.S., L. Freidovich, M.W. Spong. 'Controlled invariants and trajectory planning for underactuated mechanical systems,' in *the Proceedings of the 52nd IEEE Conference on Decision and Control*, pp. 1628-1633, Florence, Italy, December, 2013.
- [C8] Pchelkin S., A.S. Shiriaev, A. Robertsson, L. Freidovich. 'Integrated Time-optimal Trajectory Planning and Control Design for Industrial Robot Manipulator,' in *the Proceedings of IEEE/RSJ IROS*, Tokyo, 2013.
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- [C10] Rubanova A., A. Robertsson, A.S. Shiriaev, L. Freidovich, R. Johansson. 'Analytic Parameterization of Stabilizing Controllers for the Surge Subsystem of the Moore-Greitzer Compressor Model,' in *the Proceedings of the American Control Conference*, 2013.

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- [C11] Johansson R., A. Robertsson and A. Shiriaev. 'Observer-based strictly positive real (SPR) variable structure output feedback control,' in *the Proceedings of the 12th IEEE International Workshop on Variable Structure Systems*, Mumbai, pp. 452-457, 2012.

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- [C12] Shiriaev A., L. Freidovich and M.W. Spong. 'A remark on Controlled Lagrangian approach for completely integrable mechanical systems,' in the Proceedings of IFAC Workshop on Lagrangian and Hamiltonian methods for nonlinear control, Bertinoro, Italy, pp. 54-59, 2012. 2011
- [C13] Pchelkin S., A. Shiriaev, U. Mettin, L. Freidovich, Tadayoshi Aoyama, Zhiguo Lu, and Toshio Fukuda. 'Shaping Energetically Efficient Brachiation Motion for a 24-DOF Gorilla Robot,' in the Proceedings of the *IEEE/RSJ IROS*, 2011.
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- [C15] Mettin U. and A. Shiriaev. 'Ball-Pitching Challenge with an Underactuated Two-Link Robot Arm,' in *the Proceedings of the IFAC World Congress*, Milano, 2011.
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- [C21] Westerberg S, U. Mettin and A.S. Shiriaev. 'Motion Planning and Control of an Underactuated 3-DOF Helicopter,' in *the Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Taipei, 2010.
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- [C23] Freidovich L. and A.S. Shiriaev. 'Transverse linearization for an underactuated compass-like biped robot and analysis of the closed-loop system,' in *the Proceedings of the 8th IFAC Symposium on Nonlinear Control Systems (NOLCOS)*, Bologna, 2010.
- [C24] La Hera P.X., L. Freidovich, A.S. Shiriaev and U. Mettin. 'Traversing from point-to-point along a straight line with a Ballbot,' in *the Proceedings of the 8th IFAC Symposium on Nonlinear Control Systems (NOLCOS)*, Bologna, 2010.
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- [C29] Mettin U., P. La Hera, D. Ortíz Morales, A.S. Shiriaev, L.B. Freidovich, S. Westerberg. 'Path-constrained Trajectory Planning and Time-Independent Motion Control: Application to a Forestry Crane,' in *the Proceedings of the 14th International Conference on Advanced Robotics (ICAR)*, Munich, 2009.
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- [C31] Mettin U., S. Westerberg, A.S. Shiriaev, P. La Hera. 'Motion Analysis and Trajectory Re-planning for Human-operated Manipulators: Application to a Forestry Crane,' in *the Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, St. Louis, 2009.
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- [C35] La Hera P., U. Mettin, L. Freidovich and A. Shiriaev. 'Orbital stabilization of a pre-planned periodic motion to swing up the Furuta Pendulum: Theory and Experiments,' in *the Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Kobe, 2009.

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- [C36] Shiriaev A., Freidovich L. and I. Manchester. 'Planning Periodic Orbits in Impulsive Mechanical Systems Via Imposing Virtual Holonomic Constraints,' in *the Proceedings of the 47th IEEE Conference of Decision and Control (CDC)*, Cancun, 2008.
- [C37] Mettin U., P. La Hera, Freidovich L. and A.S. Shiriaev, 'Generating Periodic Motions for the Pendubot with the Help of Springs' in *the Proceedings of the 47th IEEE Conference on Decision and Control (CDC)*, Cancun, 2008.
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- [C41] Freidovich L., A. Shiriaev and I. Manchester. 'Stability Analysis and Control Design for an Underactuated Walking Robot via Computation of a Transverse Linearization,' in *the Proceedings of the 17th IFAC World Congress*, Seoul, July 6-11, 2008.
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- [C43] Lenain R., A. Robertsson, R. Johansson, A. Shiriaev and M. Berducat. 'A Velocity Observer Based on Friction Adaptation,' in *the Proceedings of IEEE International Conference on Robotics and Automation (ICRA)*, Pasadena, CA, USA, 2008.
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- [C45] Mettin U., P. La Hera, L. Freidovich and A.S. Shiriaev. 'Generating Human-like Motions for an Underactuated Three-Link Robot Based on the Virtual Constraints Approach,' in *the Proceedings of the 46th IEEE Conference on Decision and Control (CDC)*, pp. 5138-5143, 2007.
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- [C47] Freidovich L., A.S. Shiriaev, I. Manchester. 'Experimental implementation of stable oscillations of the Furuta pendulum around the upward equilibrium,' in *the Proceedings of the 20th IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, San Diego, pp. 171-176, 2007.
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