BIBLIOGRAPHY

- Abdel-Rahman, E. M., and Naefeh, A. H. Pendulation reduction in boom cranes using cable length manipulation. *Nonlinear Dynamics* 10, 3 (2002), 255–269.
- [2] Abdel-Rahman, E. M., Naefeh, A. H., and Masoud, Z. N. Dynamics and control of cranes: A review. *Journal of Vibration and Control* 9, 7 (2003), 863–908.
- [3] Ahmad, M. A., Ismail, R., and Ramli, M. S. Input shaping techniques for anti-sway control of a 3-d gantry crane system. In *International Conference on Mechatronics* and Automation, ICMA, 2009 (2009), pp. 2876–2881.
- [4] Ailon, A., and Langholz, G. On the existence of time-optimal control of mechanical manipilator. *Journal of Optimization Theory and Applications* 46, 1 (1985), 1–21.
- [5] Albassam, B. A. Near-minimum-time control design for flexible structures. In AIAA Conference and Exhibit on Guidance, Navigation, and Control (2000), pp. 14–17.
- [6] Albassam, B. A. Optimal near-minimum-time control design for flexible structuress. *Journal of Guidance, Control and Dynamics* 25, 4 (2002), 618–625.
- [7] Asada, H., Park, J. H., and Rai, S. A control-configured flexible arm integrated structure control design. In *Proceeding of 1991 IEEE International Conference on Robotics and Automation* (1991), pp. 2356–2362.
- [8] Ballas, M. J. Feedback control of flexible systems. *IEEE Transactions on Auto*matic Control 23, 4 (1978), 673–679.
- [9] Ben-Asher, J., Burns, J. A., and Cliff, E. M. Time-optimal of slewing flexible spacecraft. In *Proceedings of the 26th IEEE Conference on Decision and Control* (1987), vol. 26, pp. 524–528.
- Benosman, M., and Vey, G. L. Control of flexible manipulators: A survey. *Robotica* 22, 5 (2004), 533–545.

- [11] Bertsekas, D. P., Nedic, A., and Ozadaglar, A. E. Convex Analysis and Optimization. Athena Scientific, New Hampshire, 2003.
- [12] Borgan, W. L. Modern Control Theory. Pentice Hall, New Jersey, 1985.
- Broeck, L. V., Diehl, M., and Swevers, J. A model predictive control approach for time-optimal point-to-point motion control. *Mechatronics 21*, 7 (2011), 1203– 1212.
- [14] Cen, X. C., Wang, Q., and Ma, X. Feedforward and feedback for flexible spacecraft based on perturbation estimation. In *Intelligent Control and Automation*, 2004. WCICA 2004. Fifth World Congress on (2004), vol. 6, pp. 5496–5500.
- [15] Consolini, L., Gerelli, O., Bianco, C. G. L., and A. Piazzi, A. Minimum-time control of flexible joints with input and output constraints. In *IEEE International Conference on Robotics and Automation* (2007), pp. 3811–3816.
- [16] Devasia, S. Nonlinear minimum-time feedforward control for output transition with pre- and post-actuation. In 2010 American Control Conference (ACC) (2010), pp. 2320–2325.
- [17] Devasia, S. Nonlinear minimum-time control with pre- and post-actuation. Automatica 47, 7 (2011), 1379–1387.
- [18] Devasia, S. Time-optimal control with pre/post actuation for dual-stage systems. IEEE Transactions on Control Systems Technology 20, 2 (2012), 323–334.
- [19] Dhanda, A., and Franklin, G. F. Direct verification of parametric solution for vibration reduction control problem. *Journal of Guidance, Control and Dynamics* 31, 4 (2008), 991–998.
- [20] Dhanda, A., and Franklin, G. F. Optimal control formulations of vibration reduction problems. *IEEE Transaction on Automatic Control* 55, 2 (2010), 378–394.
- [21] Dhanda, A., and Franklin, G. F. Vibration reduction using time-optimal shaping filters with reduced higher-mode excitations. In *American Control Conference (ACC)* (2010), pp. 2302–2307.

- [22] Dixit, U. S., Kumar, R., and Dwivedy, S. K. Shape optimization of flexible robotic manipulators. *Journal of Mechanical Design 128*, 3 (2005), 559–565.
- [23] Driessen, B. J., and Sadegh, N. Minimum-time control of systems with Coloumb friction near global optima via mixed integer. *Optimal Control Applications and Methods 22*, 2 (2001), 51–62.
- [24] Ebrahimi, A., Moosaviad, S. A. A., and Mirshams, M. Minimum time optimal control of flexible spacecraft for rotational maneuvering. In *Proceedings of the* 2004 IEEE International Conference on Control Applications (2004), pp. 961–966.
- [25] Ebrahimi, A., Moosavian, S. A. A., and Mirshams, M. Comparison between minimum and near minimum time optimal control of a flexible slewing spacecraft. *Journal of Aerospace Science and Technology 3*, 3 (2006), 135–142.
- [26] Fotouhi-c, R., and Szyszkowski, W. An algorithm for time-optimal control problems. In *Journal of Dynamic Systems, Measurement, and Control* (1995), p. submitted.
- [27] Franklin, G. F., Powell, J. D., and Emami-Naeini, A. Feeback Control of Dynamic Systems, 2dn ed. Addisin Wesley, Reading, Massachusetts, 1991.
- [28] Geering, H. P., Guzzella, L., Hepner, S. A. R., and Onder, C. H. Time-optimal motions of robots in assembly tasks. *IEEE Transactions on Automatic Control 31*, 6 (1986), 512–518.
- [29] Ghasemi, M. H., Kashiri, N., and Dardel, M. Time-optimal trajectory planning of robot manipulators in point-to-point motion using an indirect method. In *Proceed*ings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science (2011), vol. 226, pp. 473–484.
- [30] Ghasemi, M. H., and Sadigh, M. J. A direct algorithm to compute the switching curve for time-optimal motion of cooperative multi-manipulators moving on a. *Advanced Robotics 22*, 5 (2008), 493–506.
- [31] Golfetto, W. A., and Fernandes, S. S. A review of gradient algorithms for numerical computation of optimal trajectories. *Journal of Aerospace, Technology and Management 4*, 2 (2012), 131–143.

- [32] Gurleyuk, S. S. Optimal unity-magnitude input shaper duration analysis. Archive of Applied Mechanics 77, 1 (2007), 63–71.
- [33] Gurleyuk, S. S. Designing unity magnitude input shaping by using pwm technique. *Mechatronics 21*, 1 (2011), 125–131.
- [34] Hermes, H., and Lasalle, J. P. Functional Analysis and Time Optimal Control. Academic Press, New York, 1969.
- [35] Hiramoto, K., Doki, H., and Obinata, G. Structural design for reduced-order hinfinity controller. In *Proceedings of the 1999 IEEE International Conference on Control Applications* (1999), vol. 1, pp. 321–326.
- [36] Hiramoto, K., and Grigoriadis, K. M. Integrated design of structural and control systems with a homotopy like iterative method. *Internation Journal of Control 79*, 9 (2006), 1062–1073.
- [37] Hocking, L. M. Optimal Control: An Introduction to Theory with Applications. Clarendon Press, Oxford, 1991.
- [38] Huey, J. R., and Singhose, W. Experimental verification of stability analysis of closed-loop signal shaping controllers. In *Proceedings of 2005 IEEE/ASME International Conference on Advanced Intelligent Mechatronics* (2005), pp. 1587–1592.
- [39] Jalili, N., and Olgac, N. Time-optimal sliding mode control implementation for robust tracking of uncertain flexible structures. *Mechatronics 8*, 2 (1998), 121– 142.
- [40] Janssens, P., Pipeleers, G., and Swevers, J. Model-free iterative learning of timeoptimal point-to-point motions for lti systems. In 2011 50th IEEE Conference on Decision and Control and European Control Conference (CDC-ECC) (2011), pp. 6031–6036.
- [41] Kahn, M. E., and Roth, B. The near-minimum-time control of open-loop articulated kinematic chains. *Journal of Dynamic Systems, Measurement, and Control* (1971).
- [42] Kim, J. J., Kased, R., and Singh, T. The robustness of a proximate time-optional controller. *Time-Optimal Control of Flexible Systems Subject to Friction 29*, 4 (2008), 257–277.

- [43] Kim, T. H., and Ha, I. J. Time-optimal control of single-dof mechanical system with friction. *IEEE Transaction on Automatic Control* 46, 5 (2001), 751–755.
- [44] Kirk, D. E. Optimal Control Theory: An Introduction. Dover Publication, New York, 1998.
- [45] Kunisch, K., and Wang, L. Time optimal control of the heat equation with pointwise control constraints. *ESAIM Control, Optimisation and Calculus of Variations 19*, 2 (2013), 460–485.
- [46] La-orpacharapan, C., and Pao, L. Y. Shaped time-optimal control for disk drive systems with back emf, slew rate limits, and different acceleration and deceleration rates. In *Proceedings of the 2004 American Control Conference* (2003), vol. 6, pp. 4788–4795.
- [47] Lai, L. C., Yang, C. C., and Wu, C. J. Time-optimal maneuvering control of a rigid spacecraft. Acta Astronautica 6, 10–11 (2007), 791–800.
- [48] Lan, W. Structural design of composite nonlinear feedback control for non minimum phase linear systems with input saturation. In *Proceedings of the 7th World Congress on Intelligent Control and Automation* (2008), pp. 1194–1199.
- [49] Lasdon, L. S., Mitter, S. K., and Waren, A. D. The conjugate gradient method for optimal control problems. *IEEE Transaction on Automatic Control 12*, 2 (1967), 132–138.
- [50] Lau, M. A., and Pao, L. Y. Comparison of input shaping and time-optimal control of flexible structure. In *Proceedings of the 2001 American Control Conference* (2001), vol. 2, pp. 1485–1490.
- [51] Levskii, M. V. The problem of the time-optimal control of spacecraft reorientation. Journal of Applied Mathematics and Mechanics (2009).
- [52] Lewis, F. L., and Syrmos, V. L. Optimal Control. Wiley-Interscience, New York, 1995.
- [53] Liao, G. J., Gong, X.-L., Xuan, S. H., Kang, C. J., and Zong, L. H. Development of a real-time tunable stiffness and damping vibration isolator based on magnetorhe-

ological elastomer. *Journal of Intelligent Material Systems and Structures 23*, 1 (2011), 25–33.

- [54] Liu, L. W., and Singh, T. Robust time-optimal control of flexible structures with parametric uncertainty. *Journal of Guidance, Control and Dynamics* (1997).
- [55] Liu, Q., and Wie, B. Robust time optimal control of uncertain flexible spacecraft. Journal of Guidance, Control and Dynamics (1992).
- [56] Lou, Y., Gong, W., Shi, J., Liu, G., and Li, Z. An integrated structure/control design of mechatronics systems. In *Proceeding of of the 7th World Congress on Intelligent Control and Automation* (2008), vol. 1, pp. 376–381.
- [57] MathWorks. Simulink User's Guide. The MathWorks, Inc., 2010, www.mathworks.com.
- [58] Meier, E. B., and Ryson, A. E. An efficient algorithm for time-optimal control of a two-link manipulator. *Journal of Dynamic Systems, Measurement, and Control* 13, 2 (1990), 859–868.
- [59] Messac, A. Control-structure integrated design with closed-form design metrics using physical programming. AIAA Journal 36, 5, 855–864.
- [60] Michalewicz, Z., Janikow, C. Z., and Krawczyk, J. B. A modified genetic algorithm for optimal control problems. *Computers & Mathematics with Applications 23*, 12 (1992), 83–94.
- [61] Michalewicz, Z., Krawczyk, J. B., Kazemi, M., and Janikow, C. Z. Genetic algorithms and optimal control problems. In *Proceedings of the 29st IEEE Conference* on Decision and Control (1990), vol. 3, pp. 1664–1666.
- [62] Moberg, S., Ohr, J., and Gunnarsson, S. A benchmark problem for robust feedback control of a flexible manipulator. *IEEE Transactions on Control System and Technology* 17, 6 (2009), 1398–1405.
- [63] Moon, M. S., VanLandingham, H. F., and Beliveau, Y. J. Expert rule based timeoptimal control of crane loads. In *Proceedings of the 1996 IEEE International Conference on Control Applications* (1996), pp. 602–607.

- [64] Moustafa, K. A. F. Feedback control of overhead cranes swing with variable rope length. In *American Control Conference* (1994), vol. 1, pp. 691–695.
- [65] Muenchhof, M., and Singh, T. Jerk limited time optimal control of flexible structures. *Journal of Dynamic Systems, Measurement, and Control 125*, 1 (2003), 139–142.
- [66] Naidu, D. S. Optimal Control System. CRC Press, Florida, 2003.
- [67] Onsay, T., and Akay, A. Vibration reduction of a flexible arm by time-optimal open-loop control. *Journal of Sound and Vibration* 147, 2 (1991), 283–300.
- [68] Pagurek, B., and Woodside, C. M. The conjugate gradient method for optimal control problems with bounded control variables. *Automatica* 4 (1986), 337–349.
- [69] Pao, L. Y. Characteristics of the time-optimal control of flexible structures with damping. In *Proceedings of the Third IEEE Conference on Control Applications* (1994), vol. 2, pp. 1299–1304.
- [70] Pao, L. Y., Chang, T. N., and Hou, E. Input shaper designs for minimizing the expected level of residual vibration in flexible structures. In *Proceedings of the* 1997 American Control Conference, vol. 6, pp. 3542–3546.
- [71] Pao, L. Y., and Franklin, G. F. Time-optimal control of flexible structures. In *Proceedings of the 29st IEEE Conference on Decision and Control* (1990), pp. 2580–2581.
- [72] Pao, L. Y., and Franklin, G. F. The robustness of a proximate time-optional controller. *IEEE Transactions on Automatic Control* 39, 9 (1994), 1963–1966.
- [73] Pao, L. Y., and La-orpacharapan, C. Shaped time-optimal feedback controllers for flexible structures. *Journal of Dynamic Systems, Measurement, and Control* (2004).
- [74] Pao, L. Y., and Singhose, W. E. On the equivalence of minimum time input shaping with traditional time-optimal control. In *Proceedings of the 4th IEEE Conference* on Control Applications (1995), pp. 1120–1125.

- [75] Pao, L. Y., and Singhose, W. E. Unity-magnitude input shaper and their relation to time-optimal control. In *Proceedings of the 1996 IFAC World Congress* (1996), pp. 151–157.
- [76] Pao, L. Y., and Singhose, W. E. Verifying robust time-optimal commands for multimode flexible spacecraft. *Journal of Guidance, Control and Dynamics 20*, 4 (1997), 881–883.
- [77] Pao, L. Y., and Singhose, W. E. Robust time-optimal control of flexible structures. *Automatica 34*, 2 (1998), 229–236.

ลยนด

- [78] Park, B. J., Hong, K. S., and Huh, C. D. Time-efficient input shaping control of container crane systems. In *Proceedings of the 2000 IEEE International Conference on Control Applications* (2000), pp. 80–85.
- [79] Park, J., Chang, P. H., and Lee, E. Can a time invatiant input shaping technique eliminate residual vibraion of ltv systems. In *Proceedings of the American Control Conference* (2002), pp. 2292–2297.
- [80] Park, J. H., and Asada, H. Integrated structure/control design of a two-link nonrigid robot arm for high speed positioning. In *Proceedings of the 1992 IEEE International Conference on Robotics and Automation* (1992), vol. 1, pp. 735–731.
- [81] Perez, O., Colmenares, W., Granado, E., Vega, P., and Francisco, M. Integrated system design with pid controllers via lmis. In *IEEE/PES Transmission & Distribution Conference and Exposition: Latin America* (2006), pp. 1–5.
- [82] Phillips, C. L., and Harbor, R. D. Feedback Control System, 4th ed. Pentice Hall, New Jersey, 2000.
- [83] Piazzi, A., and Visioli, A. Minimum-time system-inversion-based motion planning for eesidual vibration reduction. *IEEE/ASME Transactions on Mechatronics 5*, 1 (2000), 12–22.
- [84] Pil, A. P., and Asada, H. Integrated structure control design of mechatronic systems using recursive experimental optimization method. *IEEE/ASME Transactions on Mechatronics 1*, 3 (1996), 191–203.

- [85] Rai, S., and Asada, H. Integrated structure/control design of high speed flexible robots based on time optimal control. *Journal of Dynamics, System, Measurement, and Dynamics 117* (1995), 5003–512.
- [86] Reissman, T., Wolff, E. M., and Garcia, E. Piezoelectric resonance shifting using tunable nonlinear stiffness. In *Proceeding of SPIE* (2009), vol. 7288, pp. 503–512.
- [87] .Ryan, E. P. On the sensitivity of a time-optimal switching function. *IEEE Transactions on Automatic Control 25*, 2 (1980), 275–277.
- [88] S. Effati, A. N., and Shabani, H. Time optimal control problem of the heat equation with thermal source. *IMA Journal of Mathematical Control and Information 31*, 3 (2014), 385–402.
- [89] Scherer, C., Gahinet, P., and Chilali, M. Multiobjective output-feedback control via lmi optimization. *IEEE Transaction on Automatic Control 42*, 7 (1997), 896–922.
- [90] Secord, T. W., and Asada, H. H. A variable stiffness pzt actuator having tunable resonant frequencies. *IEEE Transaction on Robotics 26*, 6 (2010), 993–1005.
- [91] Shen, Z., and Andersson, S. B. Minimum-time control of a second-order system. In Proceedings of the 26th IEEE Conference on Decision and Control (2010), vol. 26, pp. 4819–4824.
- [92] Singer, N. C., and Seering, W. P. Preshaping command inputs to reduce system vibration. ASME Journal of Dynamic Systems, Measurement, and Control 112 (1990), 76–82.
- [93] Singh, G., Kabamba, P. T., and Mcclamroch, N. H. Time-optimal slewing of rigid body with flexible appendage. In *Proceedings of the 26th IEEE Conference on Decision and Control* (1987).
- [94] Singh, G., Kabamba, P. T., and Mcclamroch, N. H. Planar time-optimal rest-to-rest slewing maneuver flexible spacecraft. *Journal of Guidance, Control and Dynamics* (1989).
- [95] Singh, T., and Valadi, S. R. Robust time-optimal control frequency domain approach. *Journal of Guidance, Control and Dynamics* (1992).

- [96] Singhose, W. E. Command shaping for flexible systems a review of the first 50 years. *International Journal Of Precision Engineering and Manufacturing 10*, 4 (2009), 153–168.
- [97] Singhose, W. E., Mills, B., Biediger, E. O., and Chen, Y. Reference command shaping using specified-negative-amplitude input shapers for vibration reduction. ASME Journal of Dynamic Systems, Measurement, and Control 126, 1, 210–214.
- [98] Singhose, W. E., and Pao, L. Y. A comparison of input shaping and time optimal flexible body control. *Control Engineering Practice* 5, 4 (1997), 459–467.
- [99] Singhose, W. E., Seering, W. P., and Singer, N. P. Residual vibration reduction using vector diagrams to generate shaped inputs. *Journal of Mechanial, Design* 116, 2 (1994), 654–650.
- [100] Singhose, W. E., Singer, N. C., and Seering, W. P. Design and implementation of time-optimal negative input shapers. In ASME Winter Anual Meeting (1994), pp. 151–157.
- [101] Singhose, W. E., Singer, N. C., and Seering, W. P. Time-optimal negative input shapers. ASME Journal of Dynamic Systems, Measurement, and Control 119, 2 (1997), 198–205.
- [102] Smith, J. Y., Kozak, K., and Singhose, W. E. Input shaping for a simple nonlinear system. In *Proceedings of the 2002 American Control Conference* (2002), vol. 1, pp. 821–826.
- [103] Sorensen, K. L., Singhose, W., and Dickerson, S. A controller enabling precise positioning and sway reduction in bridge and gantry cranes. *Control Engineering Practice 15*, 7 (2007), 825–837.
- [104] Stergiopoulos, J., and Tzes, A. Adaptive input shaping for nonlinear systems: A case study. In Proceedings of the 2005 IEEE International Symposium on, Mediterrean Conference on Control and Automation (2005), pp. 188–193.
- [105] Suchaitanawanit, B., and Cole, M. O. T. An algorithm to obtain control solutions achieving minimum-time state transfer of a linear dynamical system based on

convexity of the reachable set. In *Proceeding of 4th International Conference on Intelligent Systems, Modelling and Simulation* (2013), vol. 1, pp. 340–345.

- [106] Suchaitanawanit, B., and Cole, M. O. T. Fundamental limits of performance in minimum-time motion control due to structural flexibility. In *Memoirs of the Muroran Institute of Technology* (2013), vol. 62, pp. 7–14.
- [107] Sun, Q. Control of flexible-link multiple manipulators. *Journal of Dynamic Systems, Measurement, and Control 124*, 1 (2001), 67–75.
- [108] Susuki, Y., Kawai, F., Nakazawa, C., Matsui, T., and Aiyoshi, E. Parameter optimization of model predictive control using pso. In SICE Annual Conference, 2008 (2008), pp. 1981–1988.
- [109] Thomas, S., and Bandyopadhyay, B. Position control of single link flexible manipulator by variable structure model following control. *Journal of Dynamic Systems, Measurement, and Control 22*, 2 (1997), 330–335.
- [110] Trogmann, H., and del Re, L. On the time optimal control for nonlinear saturated systems. In *Proceedings of the 51st IEEE Conference on Decision and Control* (2012), pp. 3972–3977.
- [111] Tuttle, T. D., and Seering, W. P. Creating time-optimal commands with practical constraints. *Journal of Guidance, Control and Dynamics 22*, 2 (1999), 241–250.
- [112] Vaughan, J., Daftari, A., and Singhose, W. The inuence of input shaper duration on bridge crane operator performance. In *The 9th International Conference on Motion* and Vibration Control (2008), pp. 15–18.
- [113] Weerasooriya, S., Low, T. S., and Huang, Y. H. Adaptive time optimal control of a disk drive actuator. *IEEE Transactions on Magnetics* 3, 6 (1994), 128–130.
- [114] Wells, R. L., Schueller, J. K., and Tlusty, J. Feedforward and feedback control of a flexible robotic arm. *Control Systems Magazine*, *IEEE 10*, 1 (1990), 9–15.
- [115] Yigit, A. S. On the stability of pd control for a two-link rigid-flexible manipulator. Journal of Dynamic Systems, Measurement, and Control 116, 2 (1994), 208–215.

- [116] Yurkovich, S., Garcia-Benites, E., and Watkins, J. Feedback linearization with acceleration feedback for a two-link flexible manipulator. In *American Control Conference* (1991), pp. 1360–1365.
- [117] Zhaochun, L., Xiaojie, W., Majid, B., Nicholas, M., and Faramarz, G. A tunable negative stiffness system for vibration control. In *Proceeding of SPIE* (2012), vol. 8341.
- [118] Zhiqiang, G. On discrete time-optimal control: A closed-form solution. In Proceedings of the 2004 American Control Conference (2004), vol. 1, pp. 52–58.
- [119] Zhou, N., and Liu, K. A tunable high-static-low-dynamic stiffness vibration isolator. *Journal of Sound and Vibration 329* (2010), 1254–1273.



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LIST OF PUBLICATIONS

- Suchaitanawanit, B., and Cole, M. O. T. An algorithm to obtain control solutions achieving minimum-time state transfer of a linear dynamical system based on convexity of the reachable set. In *Proceeding of 4th International Conference on Intelligent Systems, Modelling and Simulation* (2013), vol. 1, pp. 340–345.
- Suchaitanawanit, B., and Cole, M. O. T. Fundamental limits of performance in minimum-time motion control due to structural flexibility. In *Memoirs of the Muro*ran Institute of Technology (2013), vol. 62, pp. 7–14.
- Suchaitanawanit, B., and Cole, M. O. T. Mechanical Structure Optimization in Minimum-Time Motion Control of Flexible Bodies, *Automatica*, 62 (2015), pp. 213-221.



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