

Bibliography

- [1] Ancona F. and Bressan A., *Patchy Vector Fields and Asymptotic Stabilization*, ESAIM: Control, Optimisation and Calculus of Variations, **4** (1999), pp. 445-472
- [2] Andriano V., Bacciotti A. and Beccari G., *Global Stability and External Stability of Dynamical Systems*, Journal of Nonlinear Analysis, Theory, Methods and Applications, **28** (1997), pp. 1167-1185
- [3] Arnold V.I., *Algebraic Unsolvability of the Problem of Ljapunov Stability and the Problem of the Topological Classification of the Singular Points of an Analytic System of Differential Equations*, Funct. Anal. Appl., pp. 173-180 (translated from Funktsional'nyi Analiz i Ego Prilozheniya, **4** (1970), pp. 1-9)
- [4] Artstein Z., *Stabilization with Relaxed Controls*, Nonlinear Analysis, Theory, Methods and Applications, **7** (1983), pp. 1163-1173
- [5] Arzarello E. and Bacciotti A., *On Stability and Boundedness for Lipschitzian Differential Inclusions: the Converse of Liapunov's Theorems*, Set Valued Analysis, **5** (1998), pp. 377-390
- [6] Aubin J.P. and Cellina A., *Differential Inclusions*, Springer Verlag, Berlin, 1984
- [7] Aubin J.P. and Frankowska H., *Set Valued Analysis*, Birkhäuser, 1990
- [8] Auslander J. and Seibert P., *Prolongations and Stability in Dynamical Systems*, Annales Institut Fourier, Grenoble, **14** (1964), pp. 237-268
- [9] Bacciotti A., *Local Stabilizability of Nonlinear Control Systems*, World Scientific, Singapore, 1992

- [10] Bacciotti A. and Beccari G., *External Stabilizability by Discontinuous Feedback*, Proceedings of the second Portuguese Conference on Automatic Control, 1996, pp. 495-498
- [11] Bacciotti A. and Ceragioli F., *Stability and Stabilization of Discontinuous Systems and Nonsmooth Lyapunov Functions*, ESAIM: Control, Optimisation and Calculus of Variations, **4** (1999), pp. 361-376
- [12] Bacciotti A., Ceragioli F., and Mazzi L., *Differential Inclusions and Monotonicity Conditions for Nonsmooth Liapunov Functions*, to appear in Set Valued Analysis
- [13] Bacciotti A. and Mazzi L., *Some Remarks on k -Asymptotic Stability*, Bollettino U.M.I. (7) 8-A (1994), pp. 353-363
- [14] Bacciotti A. and Mazzi L., *A Necessary and Sufficient Condition for Bounded Input Bounded State Stability of Nonlinear Systems*, SIAM Journal on Control and Optimization, to appear
- [15] Bacciotti A. and Rosier L., *Liapunov and Lagrange Stability: Inverse Theorems for Discontinuous Systems*, Mathematics of Control, Signals and Systems, **11** (1998), pp. 101-128
- [16] Bacciotti A. and Rosier L., *Regularity of Liapunov Functions for Stable Systems*, Systems and Control Letters, **41** (2000), pp. 265-270
- [17] Bhat S.P. and Bernstein D.S., *Continuous Finite-Time Stabilization of the Translational and Rotational Double Integrators*, IEEE Trans. Automat. Control, **43** (1998), pp. 678-682
- [18] Bhat S.P. and Bernstein D.S., *Finite-Time Stability of Continuous Autonomous Systems*, SIAM Journal on Control and Optimization, **38** (2000), pp. 751-766.
- [19] Bhatia N.P. and Szëgo G.P., *Stability Theory of Dynamical Systems*, Springer Verlag, Berlin, 1970
- [20] Blagodatskikh V.I., *On the Differentiability of Solutions with respect to Initial Conditions*, Differential Equations, pp. 1640-1643 (translated from Differentsial'nye Uravneniya, **9** (1973), pp. 2136-2140)
- [21] Blagodatskikh V.I. and Filippov A.F., *Differential Inclusions and Optimal Control*, In *Topology, Ordinary Differential Equations, Dynamical Systems*, Proceedings of Steklov Institute of Mathematics, 1986, pp. 199-259

- [22] Bloch A. and Drakunov S., *Stabilization and Tracking in the Nonholonomic Integrator via Sliding Modes*, Systems and Control Letters, **29** (1996), pp. 91-99
- [23] Bocharov A.V. et al., *Symmetries and Conservation Laws for Differential Equations of Mathematical Physics*, Translations of Mathematical Monographs **182**, American Mathematical Society, Providence, 1999
- [24] Brezis H., *Analyse Fonctionnelle, Théorie et Applications*, Masson (1983).
- [25] Brockett R., *Asymptotic Stability and Feedback Stabilization*, in *Differential Geometric Control Theory*, Ed.s Brockett R., Millman R., Sussmann H., Birkhäuser, Boston, 1983
- [26] Byrnes C.I. and Isidori A., *New Results and Examples in Nonlinear feedback Stabilization*, Systems and Control Letters, **12** (1989), pp. 437-442
- [27] Canudas de Witt C. and Sordalen O.J., *Examples of Piecewise Smooth Stabilization of Driftless NL Systems with less Input than States*, Proceedings of IFAC-NOLCOS 92, Ed. Fliess M., pp. 26-30
- [28] Čelikowský S. and Nijmeijer H., *On the Relation Between Local Controllability and Stabilizability for a Class of Nonlinear Systems*, IEEE Transactions on Automatic Control, **42** (1997), pp. 90-94
- [29] Ceragioli F., *Some Remarks on Stabilization by means of Discontinuous Feedback*, preprint
- [30] Chugunov P.I., *Regular Solution of Differential Inclusions*, Differential Equations **17** (1981), pp. 449-455, translated from Differentsial'nye Uravneniya **17** (1981), pp. 660-668
- [31] Clarke F.H., *Optimization and Nonsmooth Analysis*, Wiley and Sons, 1983
- [32] Clarke F.H., Ledyaev Yu.S., Sontag E.D. and Subbotin A.I., *Asymptotic Controllability Implies Feedback Stabilization*, IEEE Trans. Automat. Control, **42** (1997) 1394-1407
- [33] Clarke F.H., Ledyaev Yu.S. and Stern R.J., *Asymptotic Stability and Smooth Lyapunov Functions*, Journal of Differential Equations, **149** (1998), pp. 69-114
- [34] Clarke F.H., Ledyaev Yu.S., Stern R.J. and Wolenski P.R., *Qualitative Properties of Trajectories of Control Systems: a Survey*, Journal of Dynamical and Control Systems, **1** (1995), pp. 1-48

- [35] Clarke F.H., Ledyaev Yu.S., Stern R.J. and Wolenski P.R., *Nonsmooth Analysis and Control Theory*, Springer Verlag, New York, 1998
- [36] Coddington E.A. and Levinson N., *Theory of Ordinary Differential Equations*, McGraw-Hill, New York, 1955
- [37] Conti R., *Linear Differential Equations and Control*, Academic Press, London, 1976
- [38] Coron J.M., *Links between Local Controllability and Local Continuous Stabilization*, IFAC Nonlinear Control Systems Design, Bordeaux France, 1992, pp. 165-171
- [39] Coron J.M., *Global Asymptotic Stabilization for Controllable Systems without Drift*, Mathematics of Control, Signals, and Systems, **5** (1992) pp. 295-312
- [40] Coron J.M., *Stabilizing Time-varying Feedback*, Proceedings of IFAC-NOLCOS 95, A. Krener and D. Mayne, eds., Tahoe
- [41] Coron J.M., *Stabilization in Finite Time of Locally Controllable Systems by Means of Continuous Time-varying Feedback Law*, SIAM Journal on Control and Optimization, **33** (1995), pp. 804-833
- [42] Coron J.M., *On the Stabilization of Some Nonlinear Control Systems: Results, Tools, and Applications in Nonlinear Analysis, Differential Equations and Control*, Ed.s Clarke F.H., Stern R.J., Kluwer, Dordrecht, 1999
- [43] Coron J.M. and Praly L., *Adding an Integrator for the Stabilization Problem*, Systems and Control Letters **17** (1991), pp. 89-104.
- [44] Coron J.M. and Rosier L., *A Relation Between Continuous Time-Varying and Discontinuous Feedback Stabilization*, Journal of Mathematical Systems, Estimation, and Control, **4** (1994), pp. 67-84
- [45] Dayawansa W.P., *Recent Advances in the Stabilization Problem for Low-Dimensional Systems*, in *Proceedings of IFAC Nonlinear Control Systems Design Conference*, Bordeaux, 1992, M. Fliess (ed.), pp. 1-8
- [46] Dayawansa W.P. and Martin C.F., *A Remark on a Theorem of Andreini, Bacciotti and Stefani*, Systems and Control Letters, **13** (1989), pp. 363-364
- [47] Dayawansa W.P. and Martin C.F., *Asymptotic Stability of Nonlinear Systems with Holomorphic Structure*, Proc. 28th Conf. on Decision and Control, Tampa, FL (1989)

- [48] Dayawansa W.P., Martin C.F. and Knowles G., *Asymptotic Stabilization of a Class of Smooth Two Dimensional Systems*, SIAM Journal on Control and Optimization, **28** (1990), pp. 1321-1349
- [49] Deimling K., *Multivalued Differential Equations*, de Gruyter, 1992
- [50] Doob J.L., *Measure Theory*, Springer Verlag, New York, 1994
- [51] Filippov A.F., *Differential Equations with Discontinuous Right-hand Side*, Kluwer Academic Publisher, 1988
- [52] Filippov A.F., *Differential Equations with Discontinuous Right-hand Side*, Translations of American Mathematical Society, **42** (1964), pp. 199-231
- [53] Filippov A.F., *Classical Solutions of Differential Equations with Multivalued Right-Hand Side*, SIAM J. Control, **5** (1967), pp. 609-621
- [54] Filippov A.F., *On Certain Questions in the Theory of Optimal Control*, SIAM Journal of Control, **1** (1962), pp. 76-84
- [55] Fradkov A.L., *Speed-Gradient Scheme and its Applications in Adaptive Control*, Automation and Remote Control, **40** (1979), pp. 1333-1342
- [56] Frankowska H., *Hamilton-Jacobi Equations: Viscosity Solutions and Generalized Gradients*, Journal of Mathematical Analysis and Applications, **141** (1989), pp. 21-26
- [57] Frankowska H., *Optimal Trajectories Associated with a Solution of the Contingent Hamilton-Jacobi Equation*, Applied Mathematics and Optimization, **19** (1989), pp. 291-311
- [58] Galeotti M. and Gori F., *Bifurcations and Limit Cycles in a Family of Planar Polynomial Dynamical Systems*, Rend. Sem. Mat. Univers. Politecn. Torino, **46** (1988), pp. 31-58
- [59] Hahn W., *Theory and Applications of Liapunov's Direct Method*, Prentice-Hall, Englewood Cliffs, 1963
- [60] Hahn W., *Stability of Motions*, Springer Verlag, Berlin, 1967
- [61] Haimo V.T., *Finite Time Controllers*, SIAM Journal on Control and Optimization, **24** (1986), pp. 760-770
- [62] Hájek O., *Discontinuous Differential Equations, I*, Journal of Differential Equations, **32** (1979), pp. 149-170

- [63] Hartman P., *Ordinary Differential Equations*, Birkhäuser, Boston, 1982
- [64] Hautus M.L.J., *Stabilization, Controllability and Observability of Linear Autonomous Systems*, Indagationes Mathematicae, **32** (1970), pp. 448-455
- [65] Hermes H., *The Generalized Differential Equation $\dot{x} \in R(t, x)$* , Advances in Mathematics **4** (1970), pp. 149-169
- [66] Hermes H., *Homogeneous Coordinates and Continuous Asymptotically Stabilizing Feedback Controls*, in: *Differential Equations, Stability and Controls*, S. Elaydi, Ed., Lecture Notes in Applied Math. **109**, Marcel Dekker, New York (1991), pp. 249-260
- [67] Hermes H., *Nilpotent and High-Order Approximations of Vector Field Systems*, SIAM Review, **33** (1991), pp. 238-264
- [68] Hong Y., Huang J. and Xu Y., *On an Output Feedback Finite-Time Stabilization Problem*, IEEE CDC, Phoenix, 1999, pp. 1302-1307
- [69] Il'jašenko J.S., *Analytic Unsolvability of the Stability Problem and the Problem of Topological Classification of the Singular Points of Analytic Systems of Differential Equations*, Math. USSR Sbornik, **28** (1976), pp. 140-152
- [70] Isidori A., *Nonlinear Control Systems*, Springer Verlag, 1989
- [71] Jurdjevic V., *Geometric Control Theory*, Cambridge University Press, 1997
- [72] Jurdjevic V. and Quinn J.P., *Controllability and Stability*, Journal of Differential Equations, **28**, 1978, 381-389
- [73] Kawski M., *Nilpotent Lie Algebras of Vectorfields*, J. Reine Angew. Math. **388** (1988), pp. 1-17
- [74] Kawski M., *Stabilization and Nilpotent Approximations*, Proc. 27th IEEE Conference on Decision & Control, II, (1988), pp. 1244-1248
- [75] Kawski M., *Stabilization of Nonlinear Systems in the Plane*, Systems and Control Letters, **12** (1989), pp. 169-175
- [76] Kawski M., *Homogeneous Stabilizing Feedback Laws*, Control Theory and Advanced Technology (Tokyo), **6** (1990), pp. 497-516

- [77] Kawski M., *Geometric Homogeneity and Applications to Stabilization*, Proceedings of IFAC-NOLCOS 95, A. Krener and D. Mayne, eds., Tahoe, pp. 147-152
- [78] Krasowski N.N., *The Converse of the Theorem of K.P. Persidskij on Uniform Stability*, Pribladnaja Matematika I Mehanica, **19** (1955), pp. 273-278 (in russian)
- [79] Krikorian R., *Necessary Conditions for a Holomorphic Dynamical System to Admit the Origin as a Local Attractor*, Systems and Control Letters, **20** (1993), pp. 315-318
- [80] Kurzweil J., *On the Invertibility of the First Theorem of Lyapunov Concerning the Stability of Motion* (in russian with english summary), Czechoslovak Mathematical Journal, **80** (1955), pp. 382-398
- [81] Kurzweil J., *On the Inversion of Liapunov's Second Theorem on Stability of Motion*, Translations of American Mathematical Society, **24** (1963), pp. 19-77 (originally appeared on Czechoslovak Mathematical Journal, **81** (1956), pp. 217-259)
- [82] Kurzweil J. and Vrkoč I., *The Converse Theorems of Lyapunov and Persidskij Concerning the Stability of Motion* (in russian with english summary), Czechoslovak Mathematical Journal, **82** (1957), pp. 254-272
- [83] Ledyev Y.S. and Sontag E.D., *A Lyapunov Characterization of Robust Stabilization*, Nonlinear Analysis, Theory, Methods and Applications, **37** (1999), pp. 813-840
- [84] Lin Y., Sontag E.D. and Wang Y., *A Smooth Converse Lyapunov Theorem for Robust Stability*, SIAM Journal on Control and Optimization, **34** (1996), pp. 124-160
- [85] Malgrange B., *Ideals of Differentiable Functions*, Oxford Univ. Press, 1966
- [86] Massera J.L., *On Lyapounoff's Conditions of Stability*, Annals of Mathematics, **50** (1949), pp. 705-721
- [87] Massera J.L., *Contributions to Stability Theory*, Annals of Mathematics, **64** (1956), pp. 182-206
- [88] M'Closkey R.T. and Murray R.M., *Non-holonomic Systems and Exponential Convergence: Some Analysis Tools*, in *Proc. IEEE Conf. Decision Control*, 1993, pp. 943-948

- [89] M'Closkey R.T. and Murray R.M., *Exponential Stabilization of Driftless Nonlinear Control Systems Using Homogeneous Feedback*, IEEE Trans. Automat. Control, **42** (1997), pp. 614-628
- [90] McShane E.J., *Integration*, Princeton University Press, 1947
- [91] Morin P., Pomet J.B. and Samson C., *Design of Homogeneous Time-varying Stabilizing Control Laws for Driftless Controllable Systems via Oscillatory Approximation of Lie Brackets in Closed Loop*, SIAM Journal on Control and Optimization, **38** (1999), pp. 22-49
- [92] Paden B.E. and Sastry S.S., *A Calculus for Computing Filippov's Differential Inclusions with Applications to the Variable Structure Control of Robot Manipulators*, IEEE Transactions on Circuits and Systems, **34** (1987), pp. 73-81
- [93] Pomet J.B., *Explicit Design of Time-varying Stabilizing Control Laws for a Class of Controllable Systems without Drift*, Systems and Control Letters, **18** (1992), pp. 147-158
- [94] Pomet J.B. and Samson C., *Time-Varying Exponential Stabilization of Nonholonomic Systems in Power Form*, Technical Report 2126, INRIA, (1993)
- [95] Praly L., *Generalized Weighted Homogeneity and State Dependent Time Scale for Linear Controllable Systems*, Proceedings of the 36th IEEE Conference on Decision and Control, San Diego, 1997
- [96] Prieur C., *A Robust Globally Asymptotically Stabilizing Feedback: the Example of the Artstein's Circles*, in "Nonlinear Control in the Year 2000" Ed.s Isidori A., Lamnabhi-Lagarrigue F. and Respondek W., Springer Verlag, 2000 pp. 279-300
- [97] Rifford L., *Stabilization des systèmes globalement asymptotiquement commandables*, Comptes Rendus de l'Académie des Sciences, Paris, Série I Mathématique, **330** (2000), pp. 211-216
- [98] Rifford L., *Existence of Lipschitz and Semiconcave Control Lyapunov Functions*, SIAM Journal on Control and Optimization, to appear
- [99] Rifford L., *Nonsmooth Control-Lyapunov Functions; Application to the Integrator Problem*, preprint

- [100] Rockafellar R.T. and Wets R.B., *Variational Analysis*, Springer Verlag, Berlin, 1998
- [101] Rosier L., *Homogeneous Lyapunov Function for Homogeneous Continuous Vector Field*, Systems and Control Letters, **19** (1992), pp. 467-473
- [102] Rosier L., *Inverse of Lyapunov's Second Theorem for Measurable Functions*, Proceedings of IFAC-NOLCOS 92, Ed. Fliess M., pp. 655-660
- [103] Rosier L., *Etude de quelques Problèmes de Stabilisation*, Ph. D. Thesis, Ecole Normale Supérieure de Cachan (France), 1993.
- [104] Rosier L., *Smooth Lyapunov Functions for Discontinuous Stable Systems*, Set-Valued Analysis, **7** (1999), pp. 375-405
- [105] Rosier L. and Sontag E.D., *Remarks Regarding the Gap between Continuous, Lipschitz, and Differentiable Storage Functions for Dissipation Inequalities Appearing in H_∞ Control*, Systems and Control Letters, **41** (2000), pp. 237-249
- [106] Rothschild L.P. and Stein E.M., *Hypoelliptic Differential Operators and Nilpotent Groups*, Acta Math., **137** (1976), pp. 247-320
- [107] Rouche N., Habets P. and Laloy M., *Stability Theory by Liapunov's Direct Method*, Springer Verlag, 1977
- [108] Rudin W., *Real and Complex Analysis*, McGraw Hill, 1970
- [109] Rudin W., *Principles of Mathematical Analysis*, McGraw-Hill, New York, 1987.
- [110] Ryan E.P., *On Brockett's Condition for Smooth Stabilizability and its Necessity in a Context of Nonsmooth Feedback*, SIAM Journal on Control and Optimization, **32** (1994), pp. 1597-1604
- [111] Sansone C. and Conti R., *Nonlinear Differential Equations*, Pergamon, Oxford, 1964
- [112] Sepulchre R. and Aeyels D., *Stabilizability does not Imply Homogeneous Stabilizability for Controllable Homogeneous Systems*, SIAM Journal on Control and Optimization, **34** (1996), pp. 1798-1813
- [113] Sepulchre R. and Aeyels D., *Homogeneous Lyapunov Functions and Necessary Conditions for Stabilization*, Math. Control Signals Systems, **9** (1996), pp. 34-58

- [114] Shevitz D. and Paden B., *Lyapunov Stability Theory of Nonsmooth Systems*, IEEE Transactions on Automatic Control, **39** (1994), pp. 1910-1914
- [115] Sontag E.D., *Mathematical Control Theory*, Springer Verlag, New York, 1990
- [116] Sontag E.D., *A Lyapunov-like Characterization of Asymptotic Controllability*, SIAM Journal on Control and Optimization, **21** (1983), pp. 462-471
- [117] Sontag E.D., *Smooth Stabilization Implies Coprime Factorization*, IEEE Transactions on Automatic Control, **34** (1989), pp. 435-443
- [118] Sontag E.D., *A "Universal" Construction of Artstein's Theorem on Nonlinear Stabilization*, Systems and Control Letters, **13** (1989), pp. 117-123
- [119] Sontag E.D., *Feedback Stabilization of Nonlinear Systems*, in *Robust Control of Linear Systems and Nonlinear Control*, Ed.s Kaashoek M.A., van Schuppen J.H., Ran A.C.M., Birkhäuser 1990, pp. 61-81
- [120] Sontag E.D., *On the Input-to-State Stability Property*, European Journal of Control, **1** (1995) pp. 24-36
- [121] Sontag E.D., *Nonlinear Feedback Stabilization Revisited*, in *Dynamical Systems, Control, Coding, computer Vision*, Ed.s Picci G., Gillian D.S., Birkhäuser, Basel, 1999, pp. 223-262
- [122] Sontag E.D., *Stability and Stabilization: Discontinuities and the Effect of Disturbances*, in *Nonlinear Analysis, Differential Equations and Control*, Ed.s Clarke F.H., Stern R.J., Kluwer, Dordrecht, 1999
- [123] Sontag E.D., *Clocks and Insensitivity to Small Measurement Errors*, ESAIM: Control, Optimisation and Calculus of Variations, **4** (1999), pp. 537-576
- [124] Sontag E.D. and Sussmann H.J., *Remarks on Continuous Feedback*, IEEE-CDC Conference Proceedings, Albuquerque 1980, pp. 916-921
- [125] Sontag E.D. and Sussmann H.J., *Further Comments on the Stabilizability of the Angular Velocity of a Rigid Body*, Systems and Control Letters, **12** (1989), pp. 213-217
- [126] Sontag E.D. and Sussmann H.J., *Nonsmooth Control-Lyapunov Functions*, IEEE-CDC Conference Proceedings, New Orleans 1995, pp. 2799-2805

- [127] Sontag E.D. and Wang Y., *On Characterizations of the Input-to-State Stability Property*, Systems and Control Letters, **24** (1995), pp. 351-359
- [128] Sontag E.D. and Wang Y., *New Characterizations of Input-to-State Stability*, IEEE Transaction on Automatic Control, **41** (1996), pp. 1283-1294
- [129] Sontag E.D. and Wang Y., *A Notion of Input to Output Stability*, Proceedings of European Control Conference, Brussels 1997
- [130] Sontag E.D. and Wang Y., *Notions of Input to Output Stability*, Systems and Control Letters, **38** (1999), pp. 235-248
- [131] Sontag E.D. and Wang Y., *Lyapunov Characterizations of Input to Output Stability*, SIAM Journal on Control and Optimization, to appear
- [132] Sussmann H.J., *A General Theorem on Local Controllability*, SIAM Journal on Control and Optimization, **25** (1987), pp. 158-194
- [133] Teel R.A. and Praly L., *A Smooth Lyapunov Function from a class \mathcal{KL} Estimate Involving Two Positive Semidefinite Functions*, ESAIM: Control, Optimisation and Calculus of Variations, **5** (2000), pp. 313-367
- [134] Tsiniias J., *A Local Stabilization Theorem for Interconnected Systems*, Systems and Control Letters, **18** (1992), pp. 429-434
- [135] Tsiniias J., *Sufficient Lyapunov-Like Conditions for Stabilizability*, Mathematics of Control, Signals and Systems, **2** (1989), pp. 343-357
- [136] Varaiya P.P. and Liu R., *Bounded-input Bounded-output Stability of Non-linear Time-varying Differential Systems*, SIAM Journal on Control, **4** (1966), pp. 698-704
- [137] Vidyasagar M., *Nonlinear Systems Analysis*, Prentice hall, 1993
- [138] Wonham W.M., *Linear Multivariable Control: a Geometric Approach*, Springer Verlag, New York, 1979
- [139] Yorke J.A., *Differential Inequalities and Non-Lipschitz Scalar Functions*, Mathematical Systems Theory, **4** (1970), pp. 140-153
- [140] Yoshizawa T., *On the Stability of Solutions of a System of Differential Equations*, Memoirs of the College of Sciences, University of Kyoto, Ser. A, **29** (1955), pp. 27-33

- [141] Yoshizawa T., *Liapunov's Functions and Boundedness of Solutions*, Funkcialaj Ekvacioj, **2** (1957), pp. 95-142
- [142] Yoshizawa T., *Stability Theory by Liapunov's Second Method*, Publications of the Mathematical Society of Japan No. 9, 1966
- [143] Zabczyk J., *Some Comment on Stabilizability*, Applied Mathematics and Optimization, **19** (1989), pp. 1-9
- [144] Zabczyk J., *Mathematical Control Theory: an Introduction*, Birkhäuser, Boston, 1992
- [145] Zubov V.I., *The Methods of Liapunov and their Applications*, Leningrad, 1957

Index

- absolute stability, 38
- affine system, 60
- almost continuous feedback, 62
- almost smooth feedback, 62
- Artstein's Example, 55
- asymptotic stability, 27, 80
- attraction, 79

- Carathéodory solution, 2
- cascade system, 68
- Clarke derivative, 183
- Clarke, Ledyaev and Stern Theorem, 104
- classical solution, 2
- complete controllability, 21
- contingent derivative, 182
- continuous stabilizability, 52
- control Liapunov function, 52

- damping control, 64
- Dini derivative, 182
- discrete symmetry, 170
- distribution, 69

- equi-attraction, 80
- essential continuity (e.c.t.), 105
- Euler vector field, 160
- exponential stability, 148

- Filippov solution, 4
- finite gain property, 21
- finite time stability, 153

- First Liapunov Theorem, 29, 86, 131

- generalized differential, 184
- generalized Liapunov function, 36

- Hermes' Theorem, 163
- holomorphic system, 158
- homogeneous feedback, 164
- homogeneous Liapunov function, 162
- homogeneous norm, 161
- homogeneous vector field, 159
- Hurwitz matrix, 20

- infinitesimal symmetry, 171
- input-to-output stability, 68
- ISS-Liapunov function, 49
- ISS-stability, 48
- ISS-stabilizability, 52

- Jurdjevic-Quinn method, 65

- Kurzweil's Theorem, 30, 87

- Lagrange stability, 27, 83
- Liapunov function, 28, 84
- Liapunov stability, 27, 79
- Lie bracket, 65
- Lin, Sontag and Wang Theorem, 103
- linear feedback, 22
- local controllability (STLC), 58

nonholonomic integrator, 55

periodic feedback, 96

prolongation, 38

rational stability, 150

regular solution, 191

Riccati equation, 25

robust stability, 91

Second Liapunov Theorem, 30, 86,
102

small control property, 61

stable matrix, 20

symmetric Liapunov function, 174

total stability, 43

UBIBS-Liapunov function, 49

UBIBS-stability, 48

UBIBS-stabilizability, 52

uniform global asymptotic stability
(UGAS), 102

uniform stability, 79

Yoshizawa's Theorem, 88

Lecture Notes in Control and Information Sciences

Edited by M. Thoma and M. Morari

1997–2000 Published Titles:

- Vol. 231:** Emel'yanov, S.V.; Burovoi, I.A.; Levada, F.Yu.
Control of Indefinite Nonlinear Dynamic Systems
196 pp. 1998 [3-540-76245-0]
- Vol. 232:** Casals, A.; de Almeida, A.T. (Eds)
Experimental Robotics V: The Fifth International Symposium Barcelona, Catalonia, June 15-18, 1997
190 pp. 1998 [3-540-76218-3]
- Vol. 233:** Chiacchio, P.; Chiaverini, S. (Eds)
Complex Robotic Systems
189 pp. 1998 [3-540-76265-5]
- Vol. 234:** Arena, P.; Fortuna, L.; Muscato, G.; Xibilia, M.G.
Neural Networks in Multidimensional Domains: Fundamentals and New Trends in Modelling and Control
179 pp. 1998 [1-85233-006-6]
- Vol. 235:** Chen, B.M.
 H_∞ Control and Its Applications
361 pp. 1998 [1-85233-026-0]
- Vol. 236:** de Almeida, A.T.; Khatib, O. (Eds)
Autonomous Robotic Systems
283 pp. 1998 [1-85233-036-8]
- Vol. 237:** Kreigman, D.J.; Hagar, G.D.; Morse, A.S. (Eds)
The Confluence of Vision and Control
304 pp. 1998 [1-85233-025-2]
- Vol. 238:** Elia, N.; Dahleh, M.A.
Computational Methods for Controller Design
200 pp. 1998 [1-85233-075-9]
- Vol. 239:** Wang, Q.G.; Lee, T.H.; Tan, K.K.
Finite Spectrum Assignment for Time-Delay Systems
200 pp. 1998 [1-85233-065-1]
- Vol. 240:** Lin, Z.
Low Gain Feedback
376 pp. 1999 [1-85233-081-3]
- Vol. 241:** Yamamoto, Y.; Hara S.
Learning, Control and Hybrid Systems
472 pp. 1999 [1-85233-076-7]
- Vol. 242:** Conte, G.; Moog, C.H.; Perdon A.M.
Nonlinear Control Systems
192 pp. 1999 [1-85233-151-8]
- Vol. 243:** Tzafestas, S.G.; Schmidt, G. (Eds)
Progress in Systems and Robot Analysis and Control Design
624 pp. 1999 [1-85233-123-2]
- Vol. 244:** Nijmeijer, H.; Fossen, T.I. (Eds)
New Directions in Nonlinear Observer Design
552pp: 1999 [1-85233-134-8]
- Vol. 245:** Garulli, A.; Tesi, A.; Vicino, A. (Eds)
Robustness in Identification and Control
448pp: 1999 [1-85233-179-8]
- Vol. 246:** Aeyels, D.; Lamnabhi-Lagarrigue, F.; van der Schaft, A. (Eds)
Stability and Stabilization of Nonlinear Systems
408pp: 1999 [1-85233-638-2]
- Vol. 247:** Young, K.D.; Özgüner, Ü. (Eds)
Variable Structure Systems, Sliding Mode and Nonlinear Control
400pp: 1999 [1-85233-197-6]
- Vol. 248:** Chen, Y.; Wen C.
Iterative Learning Control
216pp: 1999 [1-85233-190-9]

Vol. 249: Cooperman, G.; Jessen, E.; Michler, G. (Eds)
Workshop on Wide Area Networks and High Performance Computing
352pp: 1999 [1-85233-642-0]

Vol. 250: Corke, P. ; Trevelyan, J. (Eds)
Experimental Robotics VI
552pp: 2000 [1-85233-210-7]

Vol. 251: van der Schaft, A. ; Schumacher, J.
An Introduction to Hybrid Dynamical Systems
192pp: 2000 [1-85233-233-6]

Vol. 252: Salapaka, M.V.; Dahleh, M.
Multiple Objective Control Synthesis
192pp. 2000 [1-85233-256-5]

Vol. 253: Elzer, P.F.; Kluwe, R.H.; Boussoffara, B.
Human Error and System Design and Management
240pp. 2000 [1-85233-234-4]

Vol. 254: Hammer, B.
Learning with Recurrent Neural Networks
160pp. 2000 [1-85233-343-X]

Vol. 255: Leonessa, A.; Haddad, W.H.; Chellaboina V.
Hierarchical Nonlinear Switching Control Design with Applications to Propulsion Systems
152pp. 2000 [1-85233-335-9]

Vol. 256: Zerz, E.
Topics in Multidimensional Linear Systems Theory
176pp. 2000 [1-85233-336-7]

Vol. 257: Moallem, M.; Patel, R.V.; Khorasani, K.
Flexible-link Robot Manipulators
176pp. 2001 [1-85233-333-2]

Vol. 258: Isidori, A.; Lamnabhi-Lagarrigue, F.; Respondek, W. (Eds)
Nonlinear Control in the Year 2000
Volume 1
616pp. 2001 [1-85233-363-4]

Vol. 259: Isidori, A.; Lamnabhi-Lagarrigue, F.; Respondek, W. (Eds)
Nonlinear Control in the Year 2000
Volume 2
640pp. 2001 [1-85233-364-2]

Vol. 260: Kugi, A.
Non-linear Control Based on Physical Models
192pp. 2001 [1-85233-329-4]

Vol. 261: Talebi, H.A.; Patel, R.V.; Khorasani, K.
Control of Flexible-link Manipulators Using Neural Networks
168pp. 2001 [1-85233-409-6]

Vol. 262: Dixon, W.; Dawson, D.A.; Zergeroglu, E.; Behal, A.
Nonlinear Control of Wheeled Mobile Robots
216pp. 2001 [1-85233-414-2]

Vol. 263: Galkowski, K.
State-space Realization of Linear 2-D Systems with Extensions to the General nD ($n > 2$) Case
248pp. 2001 [1-85233-410-X]

Vol. 264: Baños, A.; Lamnabhi-Lagarrigue, F.; Montoya, F.J.
Advances in the Control of Nonlinear Systems
344pp. 2001 [1-85233-378-2]

Vol. 265: Ichikawa, A.; Katayama, H.
Linear Time Varying Systems and Sampled-data Systems
376pp. 2001 [1-85233-439-8]

Vol. 266: Stramigioli, S.
Modeling and IPC Control of Interactive Mechanical Systems - A Coordinate-Free Approach
296pp. 2001 [1-85233-395-2]