

References

1. Accinelli, E., Brida, J.G.: Population growth and the Solow–Swan model. *Int. J. Ecol. Econ. Stat.* **8**, 54–63 (2007)
2. Ahmad, S., Rao, M.R.M.: Asymptotically periodic solutions of N -competing species problem with time delays. *J. Math. Anal. Appl.* **186**, 559–571 (1994)
3. Ahmad, S., Stamov, G.Tr.: Almost periodic solutions of N -dimensional impulsive competitive systems. *Nonlinear Anal. Real World Appl.* **10**, 1846–1853 (2009)
4. Ahmad, S., Stamov, G.Tr.: On almost periodic processes in impulsive competitive systems with delay and impulsive perturbations. *Nonlinear Anal. Real World Appl.* **10**, 2857–2863 (2009)
5. Ahmad, S., Stamova, I.M.: Asymptotic stability of an N -dimensional impulsive competitive system. *Nonlinear Anal. Real World Appl.* **8**, 654–663 (2007)
6. Ahmad, S., Stamova, I.M.: Asymptotic stability of competitive systems with delays and impulsive perturbations. *J. Math. Anal. Appl.* **334**, 686–700 (2007)
7. Ahmad, S., Stamova, I.M.: Global exponential stability for impulsive cellular neural networks with time-varying delays. *Nonlinear Anal.* **69**, 786–795 (2008)
8. Ahmad, S., Stamova, I.: Stability criteria for impulsive Kolmogorov-type systems of nonautonomous differential equations. *Rend. Istit. Mat. Univ. Trieste* **44**, 19–32 (2012)
9. Ahmad, S., Stamova, I.M. (eds.): *Lotka–Volterra and Related Systems: Recent Developments in Population Dynamics*. Walter de Gruyter, Berlin (2013)
10. Akca, H., Alassar, R., Covachev, V., Covacheva, Z., Al-Zahrani, E.: Continuous-time additive Hopfield-type neural networks with impulses. *J. Math. Anal. Appl.* **290**, 436–451 (2004)
11. Akhmet, M.U., Beklioglu, M., Ergenc, T., Tkachenko, V.I.: An impulsive ratio-dependent predator-prey system with diffusion. *Nonlinear Anal. Real World Appl.* **7**, 1255–1267 (2006)
12. Allee, W.C.: Animal aggregations. *Q. Rev. Biol.* **2**, 367–398 (1927)
13. Alzabut, J.O., Nieto, J.J., Stamov, G.Tr.: Existence and exponential stability of positive almost periodic solutions for a model of hematopoiesis. *Bound. Value Probl.* **2009**, Art. ID 127510, 10 (2009)
14. Alzabut, J.O., Stamov, G.Tr., Sermutlu, E.: On almost periodic solutions for an impulsive delay logarithmic population model. *Math. Comput. Model.* **51**, 625–631 (2010)
15. Alzabut, J.O., Stamov, G.T., Sermutlu, E.: Positive almost periodic solutions for a delay logarithmic population model. *Math. Comput. Model.* **53**, 161–167 (2011)
16. Amerio, L.: Soluzioni quasi-periodiche, o limitate, di sistemi differenziali non lineari quasi-periodici, o limitati. *Ann. Mat. Pura. Appl.* **39**, 97–119 (1955)
17. Andronov, A.A., Vitt, A.A., Haykin, S.E.: *Oscillation Theory*. Nauka, Moscow (1981, in Russian)

18. Anokhin, A.V.: Linear impulsive systems for functional differential equations. Rep. Acad. Sci. SSSR **286**, 1037–1040 (1986, in Russian)
19. Anokhin, A.V., Berezansky, L., Braverman, E.: Exponential stability of linear delay impulsive differential equations. J. Math. Anal. Appl. **193**, 923–941 (1995)
20. Antoci, A., Galeotti, M., Russu, P.: Undesirable economic growth via agents' self protection against environmental degradation. J. Frankl. Inst. **344**, 377–390 (2007)
21. Arbib, M.A.: Brains, Machines and Mathematics. Springer, New York (1987)
22. Arik, S., Tavsanoglu, V.: On the global asymptotic stability of delayed cellular neural networks. IEEE Trans. Circuits Syst. I **47**, 571–574 (2000)
23. Arrow, K.J.: Price-quantity adjustments in multiple markets with rising demands. In: Proceedings of the Symposium on Mathematical Methods in the Social Science, pp. 3–15. Stanford University Press, Palo Arto (1960)
24. Bacchelli, V., Vessella, S.: Lipschitz stability for a stationary 2D inverse problem with unknown polygonal boundary. Inverse Probl. **22**, 1627–1658 (2006)
25. Bachar, M., Arino, O.: Stability of a general linear delay-differential equation with impulses. Dyn. Contin. Discret. Impuls. Syst. Ser. A Math. Anal. **10**, 973–990 (2003)
26. Bainov, D.D., Covachev, V.: Impulsive Differential Equations with a Small Parameter. World Scientific, Singapore (1994)
27. Bainov, D.D., Covachev, V., Stamova, I.M.: Estimates of the solutions of impulsive quasilinear functional differential equations. Ann. Fac. Sci. Toulouse Math. **12**, 149–161 (1991)
28. Bainov, D.D., Covachev, V., Stamova, I.M.: Stability under persistent disturbances of impulsive differential-difference equations of neutral type. J. Math. Anal. Appl. **187**, 790–808 (1994)
29. Bainov, D.D., Dishliev, A.B., Stamov, G.T.: Almost periodic solutions of hyperbolic systems of impulsive differential equations. Kumamoto J. Math. **10**, 1–10 (1997)
30. Bainov, D., Domshlak, Y., Milusheva, S.: Partial averaging for impulsive differential equations with supremum. Georgian Math. J. **3**, 11–26 (1996)
31. Bainov, D.D., Kostadinov, S.I., Myshkis, A.D.: Bounded periodic solutions of differential equations with impulsive effect in a Banach space. Differ. Integral Equ. **1**, 223–230 (1988)
32. Bainov, D.D., Kulev, G.K., Stamova, I.M.: Global stability of the solutions of impulsive differential-difference equations. SUT J. Math. **31**, 55–71 (1995)
33. Bainov, D.D., Myshkis, A.D., Stamov, G.T.: Dichotomies and almost periodicity of the solutions of systems of impulsive differential equations. Dyn. Syst. Appl. **5**, 145–152 (1996)
34. Bainov, D.D., Simeonov, P.S.: Systems with Impulsive Effect: Stability Theory and Applications. Ellis Horwood, Chichester (1989). Copublished: Wiley, New York (1993)
35. Bainov, D.D., Simeonov, P.S.: Integral Inequalities and Applications. Kluwer, Dordrecht (1992)
36. Bainov, D.D., Simeonov, P.S.: Impulsive Differential Equations: Periodic Solutions and Applications. Longman, Harlow (1993)
37. Bainov, D.D., Stamova, I.M.: Uniform asymptotic stability of impulsive differential-difference equations of neutral type by Lyapunov's direct method. J. Comput. Appl. Math. **62**, 359–369 (1995)
38. Bainov, D.D., Stamova, I.M.: Lipschitz stability of linear impulsive differential-difference equations. Note Mat. **2**, 137–142 (1995)
39. Bainov, D.D., Stamova, I.M.: Stability of sets for impulsive differential-difference equations with variable impulsive perturbations. Commun. Appl. Nonlinear Anal. **5**, 69–81 (1998)
40. Bainov, D.D., Stamova, I.M.: Vector Lyapunov functions and conditional stability for systems of impulsive differential-difference equations. ANZIAM J. **42**, 341–353 (2001)
41. Bainov, D.D., Stamova, I.M.: Lipschitz stability of impulsive functional differential equations. ANZIAM J. **42**, 504–515 (2001)
42. Bainov, D.D., Stamova, I.M., Vatsala, A.: Global stability of sets for linear impulsive differential-difference equations with variable impulsive perturbations. Appl. Anal. **62**, 149–160 (1996)

43. Ballinger, G., Liu, X.: Permanence of population growth models with impulsive effects. *Math. Comput. Model.* **26**, 59–72 (1997)
44. Barbashin, E.A.: *Lyapunov Functions*. Nauka, Moscow (1970, in Russian)
45. Bautin, N.: The theory of point transformations and dynamical theory of clockworks. In: *Qualitative Methods in the Theory of Non-linear Vibrations*. Proceedings of the International Symposium on Non-linear Vibrations II, pp. 29–54. Academy of Sciences of Ukraine SSR, Kiev (1963)
46. Belair, J., Mackey, M.C.: Consumer memory and price fluctuations in commodity markets: an integrodifferential model. *J. Dyn. Differ. Equ.* **1**, 299–525 (1989)
47. Bellassoued, M., Yamamoto, M.: Lipschitz stability in determining density and two Lamé coefficients. *J. Math. Anal. Appl.* **329**, 1240–1259 (2007)
48. Bellman, R., Cooke, K.L.: *Differential-Difference Equations*. Academic, New York (1963)
49. Benchohra, M., Henderson, J., Ntouyas, S.: *Impulsive Differential Equations and Inclusions*. Hindawi, New York (2006)
50. Berezansky, L., Braverman, E.: Explicit conditions of exponential stability for a linear impulsive delay differential equation. *J. Math. Anal. Appl.* **214**, 439–458 (1997)
51. Besicovitch, A.S.: *Almost Periodic Functions*. Dover, New York (1954)
52. Bin, L., Hill, D.J.: Optimal robust control for uncertain impulsive systems. *Proc. Control Conf.* **2007**, 381–385 (2007)
53. Bochner, S.: Beitrage zur Theorie der fastperiodischen Funktionen, I: Funktionen einer Variablen. *Math. Ann.* **96**, 119–147 (1927, in German)
54. Bochner, S.: Homogeneous systems of differential equations with almost periodic coefficients. *J. Lond. Math. Soc.* **8**, 283–288 (1933)
55. Bochner, S., von Neumann, J.: Almost periodic functions of groups. II. *Trans. Am. Math. Soc.* **37**, 21–50 (1935)
56. Bogolyubov, N.N., Mitropolskii, Y.A.: *Asymptotic Methods in the Theory of Nonlinear Variations*. Nauka, Moscow (1974, in Russian)
57. Bohr, H.: Zur Theorie der Fastperiodischen Funktionen. II: Zusammenhang der fastperiodischen Funktionen mit Funktionen von unendlich vielen Variabeln; gleichmässige Approximation durch trigonometrische Summen. *Acta Math.* **46**, 101–214 (1925, in German)
58. Bohr, H., Neugebauer, O.: Uber lineare Differentialgleichungen mit konstanten Koeffizienten und fastperiodischer rechter seite. *Nachr. Ges. Wiss. Geottingen. Math.-Phys. Klasse.* 8–22 (1926, in German)
59. Boucekkine, R., Licandro, O., Christopher, P.: Differential-difference equations in economics: on the numerical solutions of vintage capital growth model. *J. Econ. Dyn. Control* **21**, 347–362 (1997)
60. Bradley, D.M.: Verhulst's logistic curve. *Coll. Math. J.* **32**, 94–98 (2001)
61. Branicky, M.S., Borkar, V.S., Mitter, S.K.: A unified framework for hybrid control: model and optimal control theory. *IEEE Trans. Autom. Control* **43**, 31–45 (2001)
62. Brauer, F., Castillo-Chavez, C.: *Mathematical Models in Population Biology and Epidemiology*. Springer, New York (2012)
63. Briat, C., Seuret, A.: Convex dwell-time characterizations for uncertain linear impulsive systems. *IEEE Trans. Autom. Control* **57**, 3241–3246 (2012)
64. Burton, T.A.: *Stability and Periodic Solutions of Ordinary and Functional Differential Equations*. Academic, New York (1985)
65. Burton, T.A., Zhang, B.: Uniform ultimate boundedness and periodicity in functional differential equations. *Tohoku Math. J.* **42**, 93–100 (1990)
66. Butler, G., Freedman, H.I., Waltman, P.: Uniformly persistent systems. *Proc. Am. Math. Soc.* **96**, 425–430 (1986)
67. Caballero, J., Lopez, B., Sadarangani, K.: On monotonic solutions of an integral equation of Volterra type with supremum. *J. Math. Anal. Appl.* **305**, 304–315 (2005)
68. Calise, A.J., Rysdyk, R.T.: Nonlinear adaptive flight control using neural networks. *IEEE Control Syst.* **21**, 14–26 (1998)

69. Candenillas, A., Choulli, T., Taksar, M., Zhang, L.: Classical and impulse stochastic control for the optimization of the dividend and risk policies of an insurance firm. *Math. Financ.* **16**, 181–202 (2006)
70. Cao, J.: Global exponential stability of Hopfield neural networks. *Int. J. Syst. Sci.* **32**, 233–236 (2001)
71. Cao J.: New results concerning exponential stability and periodic solutions of delayed cellular neural networks. *Phys. Lett. A* **307**, 136–147 (2003)
72. Cao, J., Chen, A., Huang, X.: Almost periodic attractor of delayed neural networks with variable coefficients. *Phys. Lett. A* **340**, 104–120 (2005)
73. Cao, J., Wang, J.: Global exponential stability and periodicity of recurrent neural networks with time delays. *IEEE Trans. Circuits Syst. I* **52**, 920–931 (2005)
74. Chen, A., Cao, J.: Existence and attractivity of almost periodic solutions for cellular neural networks with distributed delays and variable coefficients. *Appl. Math. Comput.* **134**, 25–140 (2003)
75. Chen, A., Cao, J., Huang, L.: Exponential stability of BAM neural networks with transmission delays. *Neurocomputing* **57**, 435–454 (2004)
76. Chen, G.: Control and stabilization for the wave equation in a bounded domain. I. *SIAM J. Control Optim.* **17**, 66–81 (1979)
77. Chen, G., Shen, J.: Boundedness and periodicity for impulsive functional differential equations with applications to impulsive delayed Hopfield neuron networks. *Dyn. Contin. Discret. Impuls. Syst. Ser. A* **14**, 177–188 (2007)
78. Chen, M.P., Yu, J.S., Shen, J.H.: The persistence of nonoscillatory solutions of delay differential equations under impulsive perturbations. *Comput. Math. Appl.* **27**, 1–6 (1994)
79. Chen, T.: Global exponential stability of delayed Hopfield neural networks. *Neural Netw.* **14**, 977–980 (2001)
80. Chen, Y.: Global stability of neural networks with distributed delays. *Neural Netw.* **15**, 867–871 (2002)
81. Chetayev, N.G.: *The Stability of Motion*. Pergamon Press, Oxford (1961)
82. Chua, L.O.: *CNN: A Paradigm for Complexity*. World Scientific, Singapore (1998)
83. Chua, L.O., Roska, T.: Stability of a class of nonreciprocal cellular neural networks. *IEEE Trans. Circuits Syst. I* **37**, 1520–1527 (1990)
84. Chua, L.O., Yang, L.: Cellular neural networks: theory. *IEEE Trans. Circuits Syst.* **35**, 1257–1272 (1988)
85. Chua, L.O., Yang, L.: Cellular neural networks: applications. *IEEE Trans. Circuits Syst.* **35**, 1273–1290 (1988)
86. Civalleri, P.P., Gilli, M.: A set of stability criteria for delayed cellular neural networks. *IEEE Trans. Circuits Syst. I* **48**, 494–498 (2001)
87. Cobb, C.W., Douglas, P.H.: A theory of production. *Am. Econ. Rev.* **18**, 139–165 (1928)
88. Corduneanu, C.: *Almost Periodic Functions*. Interscience Publishers, New York (1968)
89. Cui, W.: Global stability of a class of neural networks model under dynamical thresholds with delay. *J. Biomath.* **15**, 420–424 (2000)
90. Cunningham, W.J.: A nonlinear differential-difference equation of growth. *Proc. Natl. Acad. Sci. U.S.A.* **40**, 708–713 (1954)
91. Dafermos, C.M.: Almost periodic processes and almost periodic solutions of evolution equations. In: *Proceedings of International Symposium on Dynamical Systems*, University of Florida, Gainesville, 1976, pp. 43–57. Academic, New York (1977)
92. Dai, C., Zhao, M., Chen, L.: Complex dynamic behavior of three-species ecological model with impulse perturbations and seasonal disturbances. *Math. Comput. Simul.* **84**, 83–97 (2012)
93. Dannan, F., Elaydi, S.: Lipschitz stability of nonlinear systems of differential equations. *J. Math. Anal. Appl.* **113**, 562–577 (1986)
94. Deardorff, A.: Growth paths in the Solow neoclassical growth model. *Q. J. Econ.* **84**, 134–139 (1970)

95. Dejong, D., Ingram, B., Whiteman, C.: Keynesian impulses versus Solow residuals: identifying sources of business cycle fluctuation. *J. Appl. Econ.* **15**, 311–329 (2000)
96. Demidovich, B.P.: Lectures on the Mathematical Theory of Stability. Nauka, Moscow (1967, in Russian)
97. Dohtani, A.: Growth-cycle model of Solow–Swan type. I. *J. Econ. Behav. Organ.* **76**, 428–444 (2010)
98. Domoshnitsky, A., Drakhlin, M.: Nonoscillation of first order impulse differential equations with delay. *J. Math. Anal. Appl.* **206**, 254–269 (1997)
99. Dong, L., Chen, L., Sun, L.: Extinction and permanence of the predator-prey system with stocking of prey and harvesting of predator impulsively. *Math. Methods Appl. Sci.* **29**, 415–425 (2006)
100. D’onofrio, A.: Stability properties of pulse vaccination strategy in SEIR epidemic model. *Math. Biosci.* **179**, 57–72 (2002)
101. Dou, J.W., Chen, L.S., Li, K.T.: A monotone-iterative method for finding periodic solutions of an impulsive competition system on tumor-normal cell interaction. *Discret. Contin. Dyn. Syst. Ser. B* **4**, 555–562 (2004)
102. Draviam, T., Coleman, T.F., Li, Y.: Dynamic liquidation under market impact. *Quant. Financ.* **11**, 69–80 (2011)
103. Driver, R.: Ordinary and Delay Differential Equations. Springer, New York (1977)
104. Emmenegger, G.-F., Stamova, I.M.: Shocks to capital intensity make the Solow equation an impulsive differential equation. *Int. J. Differ. Equ. Appl.* **6**, 93–110 (2002)
105. Fan, M., Wang, K., Jiang, D.: Existence and global attractivity of positive periodic solutions of periodic species Lotka–Volterra competition systems with several deviating arguments. *Math. Biosci.* **160**, 47–61 (1999)
106. Fanti, L., Manfredi, P.: The Solow’s model with endogenous population: a neoclassical growth cycle model. *J. Econ. Dev.* **28**, 103–115 (2003)
107. Farahani, A.M., Grove, E.A.: A simple model for price fluctuation in a single commodity. *Contemp. Math.* **129**, 97–103 (1992)
108. Faria, T.: An asymptotic stability result for scalar delayed population models. *Proc. Am. Math. Soc.* **132**, 1163–1169 (2003)
109. Ferrara, M.: A note on the Solow economic growth model with Richards population growth law. *Appl. Sci.* **13**, 36–39 (2011)
110. Fink, A.M.: Almost Periodic Differential Equations. Springer, Berlin (1974)
111. Fink, A.M.: Almost periodic solutions to forced Lienard equations. In: *Nonlinear Vibration Problems, No. 15. Proceedings of Sixth International Conference on Nonlinear Oscillations, Poznań, 1972, Part II*, pp. 95–105. PWN-Polish Scientific Publishers, Warsaw (1974)
112. Fink, A.M., Seifert, G.: Lyapunov functions and almost periodic solutions for almost periodic systems. *J. Differ. Equ.* **5**, 307–313 (1969)
113. Fowler, A.C., Mackey, M.C.: Relaxation oscillations in a class of delay differential equations. *SIAM J. Appl. Math.* **63**, 299–323 (2002)
114. Franco, D., Liz, E., Nieto, J.J., Rogovchenko, Y.V.: A contribution to the study of functional differential equations with impulses. *Math. Nachr.* **218**, 49–60 (2000)
115. Freedman, H.I.: A perturbed Kolmogorov-type model for the growth problem. *Math. Biosci.* **12**, 721–732 (1975)
116. Friedman, A.: Partial Differential Equations. Holt, Rinehart and Winston, New York (1969)
117. Frigon, M., O’Regan, D.: Impulsive differential equations with variable times. *Nonlinear Anal.* **26**, 1913–1922 (1996)
118. Gaines, R., Mawhin, J.: Coincidence Degree and Nonlinear Differential Equations. Springer, Berlin (1977)
119. Gao, S., He, Y., Chen, L.: An epidemic model with pulses for pest management. *Appl. Math. Comput.* **219**, 4308–4321 (2013)
120. Goh, B.S.: Global stability in two species interactions. *J. Math. Biol.* **3**, 313–318 (1976)
121. Gopalsamy, K.: Stability and Oscillation in Delay Differential Equations of Population Dynamics. Kluwer, Dordrecht (1992)

122. Gopalsamy, K., He, X.: Delay-independent stability in bidirectional associative memory networks. *IEEE Trans. Neural Netw.* **5**, 998–1002 (1994)
123. Gopalsamy, K., Leung, I.K.C.: Convergence under dynamical thresholds with delays. *IEEE Trans. Neural Netw.* **8**, 341–348 (1997)
124. Gopalsamy, K., Weng, P.: Global attractivity and level crossing in model of hematopoiesis. *Bull. Inst. Math. Acad. Sinica* **22**, 341–360 (1994)
125. Gopalsamy, K., Zhang, B.: On delay differential equations with impulses. *J. Math. Anal. Appl.* **139**, 110–122 (1989)
126. Guerrini, L.: The Solow–Swan model with a bounded population growth rate. *J. Math. Econ.* **42**, 14–21 (2006)
127. Guerrini, L.: Global asymptotic stability of an economic growth model: an alternative proof. *Int. J. Contemp. Math. Sci.* **6**, 1293–1296 (2011)
128. Gurgulla, S.I., Perestyuk, N.A.: On Lyapunov's second method in systems with impulse action. *Dokl. Akad. Nauk Ukr. SSR Ser. A* **10**, 11–14 (1982, in Russian)
129. Halanay, A., Wexler, D.: *Qualitative Theory of Impulse Systems*. Mir, Moscow (1971, in Russian)
130. Hale, J.K.: *Theory of Functional Differential Equations*. Springer, New York (1977)
131. Hale, J.K., Verduyn Lunel, S.M.: *Introduction to Functional Differential Equations*. Springer, New York (1993)
132. Hardy, G.H., Littlewood, J.E., Polya, G.: *Inequalities*, 2nd edn. Cambridge University Press, London (1952)
133. Hartman, P.: *Ordinary Differential Equations*. Wiley, New York (1964)
134. Haykin, S.: *Neural Networks: A Comprehensive Foundation*. Prentice-Hall, Englewood Cliffs (1998)
135. He, M., Chen, F., Li, Z.: Almost periodic solution of an impulsive differential equation model of plankton allelopathy. *Nonlinear Anal. Real World Appl.* **11**, 2296–2301 (2010)
136. He, X.Z., Zheng, M.: Dynamics of moving average rules in a continuous-time financial market model. *J. Econ. Behav. Organ.* **76**, 615–634 (2010)
137. Hekimova, M.A., Bainov, D.D.: Almost periodic solutions of singularly perturbed systems of differential equations with impulse effect. *Forum Math.* **1**, 323–329 (1989)
138. Henry, D.: *Geometric Theory of Semilinear Parabolic Equations*. Springer, Berlin (1981)
139. Hino, Y.: Stability and existence of almost periodic solutions of some functional differential equations. *Tohoku Math. J.* **28**, 389–409 (1976)
140. Ho, D.W.C., Sun, J.: Stability of Takagi–Sugeno fuzzy delay systems with impulse. *IEEE Trans. Fuzzy Syst.* **15**, 784–790 (2007)
141. Hopfield, J.J.: Neurons with graded response have collective computational properties like those of two-stage neurons. *Proc. Natl. Acad. Sci. U.S.A.* **81**, 3088–3092 (1984)
142. Horn, R.A., Johnson, C.R.: *Matrix Analysis*. Cambridge University Press, Cambridge (1985)
143. Hsu, Y., Wang, S., Yu, C.: A sequential approximation method using neural networks for engineering design optimization problems. *Eng. Optim.* **35**, 489–511 (2003)
144. Hu, D., Zhao, H., Zhu, H.: Global dynamics of Hopfield neural networks involving variable delays. *Comput. Math. Appl.* **42**, 39–45 (2001)
145. Huang, H., Cao, J.: On global asymptotic stability of recurrent neural networks with time-varying delays. *Appl. Math. Comput.* **142**, 143–154 (2003)
146. Huang, M., Li, J., Song, X., Guo, H.: Modeling impulsive injections of insulin: towards artificial pancreas. *SIAM J. Appl. Math.* **72**, 1524–1548 (2012)
147. Hui, J., Chen, L.: Periodicity in an impulsive logistic equation with a distributed delay. *IMA J. Appl. Math.* **70**, 479–487 (2005)
148. Huo, H.F.: Existence of positive periodic solutions of a neutral delay Lotka–Volterra system with impulses. *Comput. Math. Appl.* **48**, 1833–1846 (2004)
149. Hutchinson, G.F.: Circular causal systems in ecology. *Ann. N. Y. Acad. Sci.* **50**, 221–246 (1948)
150. Iacobucci, E.M., Trebilcock, M.J., Haider, H.: *Economic Shocks: Defining a Role for Government*. C. D. Howe Institute, Toronto (2001)

151. Ikeda, M., Ohta, Y., Siljak, D.D.: Parametric stability. In: *New Trends in Systems Theory*, Genoa, 1990. *Progress in Systems and Control Theory*, vol. 7, pp. 1–20. Birkhäuser, Boston (1991)
152. Imanuvilov, O., Yamamoto, M.: Global Lipschitz stability in an inverse hyperbolic problem by interior observations. *Inverse Probl.* **17**, 717–728 (2001)
153. Izyumov, A., Vahaly, J.: New capital accumulation in transition economies: implications for capital-labor and capital-output ratios. *Econ. Change Restruct.* **39**, 63–83 (2006)
154. Jiao, J., Ye, K., Chen, L.: Dynamical analysis of a five-dimensional chemostat model with impulsive diffusion and pulse input environmental toxicant. *Chaos Solitons Fractals* **44**, 17–27 (2011)
155. Jin, Z., Maoan, H., Guihua, L.: The persistence in a Lotka–Volterra competition systems with impulsive perturbations. *Chaos Solitons Fractals* **24**, 1105–1117 (2005)
156. Joelianto, E., Sutarto, H.Y.: Controlled switching dynamical systems using linear impulsive differential equations. In: Budiyo, A., Riyanto, B., Joelianto, E. (eds.) *Intelligent Unmanned Systems: Theory and Applications*, vol. 192, pp. 227–244. Springer, Berlin (2009)
157. Jost, C., Ariono, O., Arditi, R.: About deterministic extinction in ratio-dependent predator-prey models. *Bull. Math. Biol.* **61**, 19–32 (1999)
158. Kapur, J.N.: *Mathematical Modelling*. Wiley, New York (1988)
159. Kato, J.: Stability problems in functional differential equation with infinite delays. *Funkcial. Ekvac.* **21**, 63–80 (1978)
160. Khadra, A., Liu, X., Shen, X.: Application of impulsive synchronization to communication security. *IEEE Trans. Circuits Syst. I* **50**, 341–351 (2003)
161. Khadra, A., Liu, X., Shen, X.: Robust impulsive synchronization and application to communication security. *Dyn. Contin. Discret. Impuls. Syst.* **10**, 403–416 (2003)
162. Kim, S., Campbell, S., Liu, X.: Stability of a class of linear switching systems with time delay. *IEEE Trans. Circuits Syst. I* **53**, 384–393 (2006)
163. Kirlinger, G.: Permanence in Lotka–Volterra equations: linked prey-predator systems. *Math. Biosci.* **82**, 165–191 (1986)
164. Kolmanovskii, V.B., Myshkis, A.D.: *Applied Theory of Functional Differential Equations*. Kluwer Academic, Dordrecht (1992)
165. Kolmanovskii, V.B., Nosov, V.R.: *Stability of Functional-Differential Equations*. Academic, London (1986)
166. Kosko, B.: Adaptive bidirectional associative memories. *Appl. Opt.* **26**, 4947–4960 (1987)
167. Kosko, B.: Bi-directional associative memories. *IEEE Trans. Syst. Man Cybern.* **18**, 49–60 (1988)
168. Kosko, B.: *Neural Networks and Fuzzy Systems – A Dynamical Systems Approach to Machine Intelligence*. Prentice-Hall, Englewood Cliffs (1992)
169. Kou, C., Adimy, M., Ducrot, A.: On the dynamics of an impulsive model of hematopoiesis. *Math. Model. Nat. Phenom.* **4**, 89–112 (2009)
170. Krasnosel'skii, M.A., Burd, V.Sh., Kolesov, Yu.S.: *Nonlinear Almost Periodic Oscillations*. Wiley, New York (1973)
171. Krasovskii, N.N.: *Stability of Motion*. Stanford University Press, Stanford (1963)
172. Krishna, S., Vasundhara, J., Satyavani, K.: Boundedness and dichotomies for impulsive equations. *J. Math. Anal. Appl.* **158**, 352–375 (1991)
173. Kuang, Y.: *Delay Differential Equations with Applications in Population Dynamics*. Academic, Boston (1993)
174. Küchler, U., Platen, E.: Time delay and noise explaining cyclical fluctuations in prices of commodities. Technical report, 195. Quantitative Finance Research Centre, University of Technology, Sydney (2007)
175. Kulenovic, M.R.S., Ladas, G.: Linearized oscillations in population dynamics. *Bull. Math. Biol.* **49**, 615–627 (1987)
176. Kulev, G.K., Bainov, D.D.: Strong stability of impulsive systems. *Int. J. Theor. Phys.* **27**, 745–755 (1988)

177. Kulev, G.K., Bainov, D.D.: Lipschitz stability of impulsive systems of differential equations. *Int. J. Theor. Phys.* **30**, 737–756 (1991)
178. Lakshmikantham, V., Bainov, D.D., Simeonov, P.S.: *Theory of Impulsive Differential Equations*. World Scientific, Teaneck (1989)
179. Lakshmikantham, V., Leela, S.: *Differential and Integral Inequalities: Theory and Applications*. Academic, New York (1969)
180. Lakshmikantham, V., Leela, S., Martynyuk, A.A.: *Stability Analysis of Nonlinear Systems*. Marcel Dekker, New York (1989)
181. Lakshmikantham, V., Leela, S., Martynyuk, A.A.: *Practical Stability Analysis of Nonlinear Systems*. World Scientific, Singapore (1990)
182. Lakshmikantham, V., Liu, X.: *Stability Analysis in Terms of Two Measures*. World Scientific, River Edge (1993)
183. Lakshmikantham, V., Matrosov, V.M., Sivasundaram, S.: *Vector Lyapunov Functions and Stability Analysis of Nonlinear Systems*. Kluwer, Dordrecht (1991)
184. Lakshmikantham, V., Rao, M.R.M.: *Theory of Integro-Differential Equations*. Gordon and Breach, Lausanne (1995)
185. Lasota, A., Mackey, M.C.: *Probabilistic Properties of Deterministic Systems*. Cambridge University Press, London/New York (1985)
186. Levitan, B.M.: *Almost Periodic Functions*. Gostekhizdat, Moscow (1953, in Russian)
187. Levitan, B.M., Zhikov, V.V.: *Almost Periodic Functions and Differential Equations*. Cambridge University Press, Cambridge (1983)
188. Li, C., Liao, X., Yang, X., Huang, T.: Impulsive stabilization and synchronization of a class of chaotic delay systems. *Chaos* **15**, 043103 (2005)
189. Li, J., Yan, J.: Partial permanence and extinction in an N -species nonautonomous Lotka–Volterra competitive system. *Comput. Math. Appl.* **55**, 76–88 (2008)
190. Li, M., Duan, Y., Zhang, W., Wang, M.: The existence of positive periodic solutions of a class of Lotka–Volterra type impulsive systems with infinitely distributed delay. *Comput. Math. Appl.* **49**, 1037–1044 (2005)
191. Li, Y.: Global exponential stability of BAM neural networks with delays and impulses. *Chaos Solitons Fractals* **24**, 279–285 (2005)
192. Li, W.T., Fan, Y.H.: Existence and global attractivity of positive periodic solutions for the impulsive delay Nicholson's blowflies model. *J. Comput. Appl. Math.* **201**, 55–68 (2007)
193. Li, Z.: Positive almost periodic solutions for neural multi-delay logarithmic population model. *Int. J. Math. Comput. Sci.* **6**, 177–181 (2012)
194. Li, Z., Wang, T., Chen, L.: Periodic solution of a chemostat model with Beddington–DeAngelis uptake function and impulsive state feedback control. *J. Theor. Biol.* **261**, 23–32 (2009)
195. Lichtenberg, A.J., Leiberman, M.A.: *Regular and Stochastic Motion*. Springer, New York/Berlin (1983)
196. Liu, B.: Global stability of a class of non-autonomous delay differential systems. *Proc. Am. Math. Soc.* **138**, 975–985 (2010)
197. Liu, B., Liu, X., Liao X.: Robust stability of uncertain dynamical systems. *J. Math. Anal. Appl.* **290**, 519–533 (2004)
198. Liu, H., Yu, J., Zhu, G.: Global behaviour of an age-infection-structured HIV model with impulsive drug-treatment strategy. *J. Theor. Biol.* **253**, 749–754 (2008)
199. Liu, J.: Bounded and periodic solutions of finite delay evolution equations. *Nonlinear Anal.* **34**, 101–111 (1998)
200. Liu, X.: Impulsive stabilization and applications to population growth models. *Rocky Mt. J. Math.* **25**, 381–395 (1995)
201. Liu, X.: Stability of impulsive control systems with time delay. *Math. Comput. Model.* **39**, 511–519 (2004)
202. Liu, X., Ballinger, G.: Existence and continuability of solutions for differential equations with delays and state-dependent impulses. *Nonlinear Anal.* **51**, 633–647 (2002)
203. Liu, X., Rohlf, K.: Impulsive control of a Lotka–Volterra system. *IMA J. Math. Control Inf.* **15**, 269–284 (1998)

204. Liu, X., Takeuchi, Y.: Periodicity and global dynamics of an impulsive delay Lasota–Ważewska model. *J. Math. Anal. Appl.* **327**, 326–341 (2007)
205. Liu, X., Teo, K.L., Hu, B.: Exponential stability of impulsive high-order Hopfield-type neural networks with time-varying delays. *IEEE Trans. Neural Netw.* **16**, 1329–1339 (2005)
206. Liu, X., Wang, Q.: The method of Lyapunov functionals and exponential stability of impulsive systems with time delay. *Nonlinear Anal.* **66**, 1465–1484 (2007)
207. Liu, Y., Ge, W.: Global attractivity in delay “food-limited” models with exponential impulses. *J. Math. Anal. Appl.* **287**, 200–216 (2003)
208. Liu, Y., Zhao, S.: Controllability analysis of linear time-varying systems with multiple time delays and impulsive effects. *Nonlinear Anal. Real World Appl.* **13**, 558–568 (2012)
209. Liu, Z.J.: Positive periodic solutions for delay multispecies logarithmic population model. *J. Eng. Math.* **19**, 11–16 (2002, in Chinese)
210. Lou, X.Y., Cui, B.T.: Global asymptotic stability of delay BAM neural networks with impulses. *Chaos Solitons Fractals* **29**, 1023–1031 (2006)
211. Luo, J., Yu, J.: Global asymptotic stability of nonautonomous mathematical ecological equations with disturbed deviating arguments. *Acta Math. Sinica* **41**, 1273–1282 (1998, in Chinese)
212. Luo, Y., Luo, Z.: Existence of positive periodic solutions for neutral multi-delay logarithmic population model. *Appl. Math. Comput.* **216**, 1310–1315 (2010)
213. Luo, Z., Shen, J.: Stability and boundedness for impulsive functional differential equations with infinite delays. *Nonlinear Anal.* **46**, 475–493 (2001)
214. Lyapunov, A.M.: *General Problem on Stability of Motion*. Gostechizdat, Moscow (1950, in Russian)
215. Mackey, M.: Commodity price fluctuations: price dependent delays and nonlinearities as explanatory factors. *J. Econ. Theory* **48**, 495–509 (1989)
216. Mackey, M.C., Glass, L.: Oscillation and chaos in physiological control system. *Science* **197**, 287–289 (1977)
217. Malkin, I.G.: *Theory of Stability of Motion*. Nauka, Moscow (1966, in Russian)
218. Markoff, A.: Stabilität im Liapounoffschen Sinne und Fastperiodizität. *Math. Z.* **36**, 708–738 (1933, in German)
219. Martin, R.H.: *Nonlinear Operators and Differential Equations in Banach Spaces*. Wiley, New York (1976)
220. Martynyuk, A.: *Advances in Stability Theory at the End of the 20th Century. Stability and Control: Theory, Methods and Applications*, vol. 13. Taylor and Francis, London (2003)
221. Matsumoto, A., Szidarovszky, F.: Asymptotic behavior of a delay differential neoclassical growth model. *Sustainability* **5**, 440–455 (2013)
222. May, R.M.: *Stability and Complexity in Model Ecosystems*. Princeton University Press, Princeton (1973)
223. Maynard-Smith, J.: *Models in Ecology*. Cambridge University Press, Cambridge (1974)
224. McCulloch, J.R.: *A Treatise on the Circumstances Which Determine the Rate of Wage and the Condition of the Labouring Classes*. Longman, London (1854)
225. Mil'man, V.D., Myshkis, A.D.: On the stability of motion in the presence of impulses. *Sib. Math. J.* **1**, 233–237 (1960, in Russian)
226. Mohammad, S.: The impact of oil prices volatility on export earning in Pakistan. *Eur. J. Sci. Res.* **41**, 543–550 (2010)
227. Mohamad, S., Gopalsamy, K.: A unified treatment for stability preservation in computer simulation of impulsive BAM networks. *Comput. Math. Appl.* **55**, 2043–2063 (2008)
228. Moreno, D.: Prices, delay and the dynamics of trade. *J. Econ. Theory* **104**, 304–339 (2002)
229. Muresan, A.S.: On some models of price fluctuations in a market economy. *Studia Univ. Babeş-Bolyai Math.* **38**, 15–19 (1993)
230. Muresan, A.S.: On a functional-differential equation from price theory. In: *Proceedings of the IEEE 2009 International Symposium on Symbolic and Numeric Algorithms for Scientific Computing*, Timișoara, pp. 150–156 (2009)

231. Naghshtabrizi, P., Hespanha, J.P., Teel, A.R.: Exponential stability of impulsive systems with application to uncertain sampled-data systems. *Syst. Control Lett.* **57**, 378–385 (2008)
232. Nerlove, M., Raut K.L.: Growth models with endogenous population: a general framework. In: Rosenzweig, M., Stark, O. (eds.) *Handbook of Family and Population Economics*, pp. 1117–1174. North-Holland, Amsterdam (1997)
233. Neugebauer, O.: *The Exact Sciences in Antiquity*. Braun University Press, Providence (1957)
234. Nicholson, A.J.: The balance of animal population. *J. Anim. Ecol.* **2**, 132–178 (1933)
235. Nieto, J.: Periodic boundary value problems for first-order impulsive ordinary differential equations. *Nonlinear Anal.* **51**, 1223–1232 (2002)
236. Nieto, J., O'Regan, D.: Variational approach to impulsive differential equations. *Nonlinear Anal. Real World Appl.* **10**, 680–690 (2009)
237. Nindjin, A.F., Aziz-Alaoui, M.A., Cadivel, M.: Analysis of predator-prey model with modified Leslie–Gower and Holling-type II schemes with time delay. *Nonlinear Anal. Real World Appl.* **7**, 1104–1118 (2006)
238. Pandit, S.G., Deo, S.G.: *Differential Systems Involving Impulses*. Springer, Berlin/Heidelberg/New York (1982)
239. Pazy, A.: *Semigroups of Linear Operators and Applications to Partial Differential Equations*. Springer, New York (1983)
240. Perestyuk, N.A., Ahmetov, M.U.: On almost periodic solutions of a class of systems with periodic impulsive action. *Ukr. Math. J.* **36**, 486–490 (1984)
241. Perestyuk, N.A., Chernikova, O.S.: On the stability of integral sets of impulsive differential systems. *Math. Notes (Miskolc)* **2**, 49–60 (2001)
242. Petela, J.: Average conditions for Kolmogorov systems. *Appl. Math. Comput.* **215**, 481–494 (2009)
243. Pianka, E.R.: *Evolutionary Ecology*. Harper and Row, New York (1974)
244. Pielou, E.C.: *An Introduction to Mathematical Ecology*. Wiley, New York (1969)
245. Popov, E.R.: *Automatic Regulation and Control*. Nauka, Moscow (1966, in Russian)
246. Qiao, M., Liu, A., Forsys, U.: Qualitative analysis of the SICR epidemic model with impulsive vaccinations. *Math. Methods Appl. Sci.* **36**, 695–706 (2013)
247. Rao M.R.M., Rao, V.S.H.: Stability of impulsively perturbed systems. *Bull. Aust. Math. Soc.* **16**, 99–110 (1977)
248. Rao, M.R.M., Sathanantham, S., Sivasundaram, S.: Asymptotic behavior of solutions of impulsive integro-differential systems. *Appl. Math. Comput.* **34**, 195–211 (1989)
249. Razumikhin, B.S.: *Stability of Hereditary Systems*. Nauka, Moscow (1988, in Russian)
250. Roska, T., Wu, C.W., Balsi, M., Chua, L.O.: Stability and dynamics of delay-type general cellular neural networks. *IEEE Trans. Circuits Syst. I* **39**, 487–490 (1992)
251. Rouche, H., Habets, P., Laloy, M.: *Stability Theory by Lyapunov's Direct Method*. Springer, New York (1977)
252. Ruan, S.: Absolute stability, conditional stability and bifurcation in Kolmogorov-type predator-prey systems with discrete delays. *Q. Appl. Math.* **59**, 159–173 (2001)
253. Rus, A.T., Iancu, C.: A functional-differential model for price fluctuations in a single commodity market. *Studia Univ. Babeş-Bolyai Math.* **2**, 9–14 (1993)
254. Saaty, T.L., Joyce, M.: *Thinking with Models: Mathematical Models in the Physical, Biological, and Social Sciences*. Pergamon Press, Oxford (1981)
255. Saker, S.H., Agarwal, S.: Oscillation and global attractivity in a periodic Nicholson's blowflies model. *Math. Comput. Model.* **35**, 719–731 (2002)
256. Samoilenko, A.M., Perestyuk, N.A.: *Differential Equations with Impulse Effect*. World Scientific, Singapore (1995)
257. Samoilenko, A.M., Trofimchuk, S.: Spaces of piecewise-continuous almost-periodic functions and of almost-periodic sets on the line I. *Ukr. Math. J.* **43**, 1613–1619 (1991, in Russian)
258. Seifert, G.: Almost periodic solutions for almost periodic systems of ordinary differential equations. *J. Differ. Equ.* **2**, 305–319 (1966)
259. Seifert, G.: Nonlinear evolution equation with almost periodic time-dependence. *SIAM J. Math. Anal.* **18**, 387–392 (1987)

260. Shen, J.: Razumikhin techniques in impulsive functional differential equations. *Nonlinear Anal.* **36**, 119–130 (1999)
261. Siljak, D.D.: *Large-Scale Dynamic Systems. Stability and Structure*. Dover, New York (2007)
262. Simeonov, P.S., Bainov, D.D.: Estimates for the Cauchy matrix of perturbed linear impulsive equation. *Int. J. Math. Math. Sci.* **17**, 753–758 (1994)
263. Smith, R.J., Wahl, L.M.: Distinct effects of protease and reverse transcriptase inhibition in an immunological model of HIV-1 infection with impulsive drug effects. *Bull. Math. Biol.* **66**, 1259–1283 (2004)
264. Smith, S., Escobedo, R., Anderson, M., Caudell, T.: A deployed engineering design retrieval system using neural networks. *IEEE Trans. Neural Netw.* **8**, 847–851 (1997)
265. So, J.W., Yu, J.S.: Global attractivity and uniform persistence in Nicholson's blowflies. *Differ. Equ. Dyn. Syst.* **2**, 11–18 (1994)
266. Solow, R.: A contribution to the theory of economic growth. *Q. J. Econ.* **70**, 65–94 (1956)
267. Song, Q.K., Cao, J.D.: Global exponential stability of bidirectional associative memory neural networks with distributed delays. *J. Comput. Appl. Math.* **202**, 266–279 (2007)
268. Stamov, G.T.: Almost periodic solutions for systems of impulsive integro-differential equations. *Appl. Anal.* **64**, 319–327 (1997)
269. Stamov, G.T.: Almost periodic solutions for forced perturbed impulsive differential equations. *Appl. Anal.* **74**, 45–56 (2000)
270. Stamov, G.T.: Existence of almost periodic solutions for strong stable impulsive differential equations. *IMA J. Math. Control Inf.* **18**, 153–160 (2001)
271. Stamov, G.T.: Existence of almost periodic solutions for impulsive differential equations with perturbations of the linear part. *Nonlinear Stud.* **9**, 263–273 (2002)
272. Stamov, G.Tr.: Second method of Lyapunov for existence of almost periodic solutions for impulsive integro-differential equations. *Kyungpook Math. J.* **43**, 221–231 (2003)
273. Stamov, G.Tr.: Impulsive cellular neural networks and almost periodicity. *Proc. Jpn. Acad. Ser. A Math. Sci.* **80**, 198–203 (2004)
274. Stamov, G.Tr.: Asymptotic stability in the large of the solutions of almost periodic impulsive differential equations. *Note Mat.* **24**, 75–83 (2005)
275. Stamov, G.Tr.: Almost periodic solutions of impulsive differential equations with time-varying delay on the PC-space. *Nonlinear Stud.* **14**, 269–279 (2007)
276. Stamov, G.T.: Almost periodic models in impulsive ecological systems with variable diffusion. *J. Appl. Math. Comput.* **27**, 243–255 (2008)
277. Stamov, G.Tr.: Existence of almost periodic solutions for impulsive cellular neural networks. *Rocky Mt. J. Math.* **38**, 1271–1285 (2008)
278. Stamov, G.Tr.: On the existence of almost periodic solutions for impulsive Lasota–Ważewska model. *Appl. Math. Lett.* **22**, 516–520 (2009)
279. Stamov, G.T.: Uncertain impulsive differential-difference equations and stability of moving invariant manifolds. *J. Math. Sci.* **161**, 320–326 (2009)
280. Stamov, G.Tr.: Almost periodic models of impulsive Hopfield neural networks. *J. Math. Kyoto Univ.* **49**, 57–67 (2009)
281. Stamov, G.Tr.: Almost periodic processes in ecological systems with impulsive perturbations. *Kyungpook Math. J.* **49**, 299–312 (2009)
282. Stamov, G.Tr.: Almost periodic solutions in impulsive competitive systems with infinite delays. *Publ. Math. Debr.* **76**, 89–100 (2010)
283. Stamov, G.Tr.: Almost periodicity and Lyapunov's functions for impulsive functional differential equations with infinite delays. *Can. Math. Bull.* **53**, 367–377 (2010)
284. Stamov, G.T.: *Almost Periodic Solutions of Impulsive Differential Equations*. Springer, Berlin (2012)
285. Stamov, G., Akca, H., Stamova, I.: Uncertain dynamical systems: analysis and applications. *Abstr. Appl. Anal.* **2013**, Article ID 863060 (2013)
286. Stamov, G.Tr., Alzabut, J.O.: Almost periodic solutions for abstract impulsive differential equations. *Nonlinear Anal.* **72**, 2457–2464 (2010)

287. Stamov, G.Tr., Alzabut, J.O.: Almost periodic solutions of impulsive integro-differential neural networks. *Math. Model. Anal.* **15**, 505–516 (2010)
288. Stamov, G.Tr., Alzabut, J.O.: Almost periodic solutions in the PC-space for uncertain impulsive dynamical systems. *Nonlinear Anal.* **74**, 4653–4659 (2011)
289. Stamov, G.Tr., Alzabut, J.O., Atanasov, P., Stamov, A.G.: Almost periodic solutions for an impulsive delay model of price fluctuations in commodity markets. *Nonlinear Anal. Real World Appl.* **12**, 3170–3176 (2011)
290. Stamov, G.Tr., Stamov, A.: On almost periodic processes in uncertain impulsive delay models of price fluctuations in commodity markets. *Appl. Math. Comput.* **219**, 5376–5383 (2013)
291. Stamov, G.Tr., Stamova, I.M.: Almost periodic solutions for impulsive neural networks with delay. *Appl. Math. Model.* **31**, 1263–1270 (2007)
292. Stamov, G.T., Stamova, I.M., Alzabut, J.O.: Existence of almost periodic solutions for strongly stable nonlinear impulsive differential-difference equations. *Nonlinear Anal. Hybrid Syst.* **6**, 818–823 (2012)
293. Stamova, I.M.: Lyapunov method for boundedness of solutions of nonlinear impulsive functional differential equations. *Dyn. Syst. Appl.* **14**, 561–568 (2005)
294. Stamova, I.M.: Global asymptotic stability of impulse delayed cellular neural networks with dynamical threshold. *Nonlinear Stud.* **13**, 113–122 (2006)
295. Stamova, I.M.: Vector Lyapunov functions for practical stability of nonlinear impulsive functional differential equations. *J. Math. Anal. Appl.* **325**, 612–623 (2007)
296. Stamova, I.M.: Parametric stability of impulsive functional differential equations. *J. Dyn. Control Syst.* **14**, 235–250 (2008)
297. Stamova, I.M.: Boundedness of impulsive functional differential equations with variable impulsive perturbations. *Bull. Aust. Math. Soc.* **77**, 331–345 (2008)
298. Stamova, I.: *Stability Analysis of Impulsive Functional Differential Equations*. Walter de Gruyter, Berlin (2009)
299. Stamova, I.M.: Lyapunov method for boundedness of the solutions of impulsive functional differential equations with respect to sets. *J. Theor. Appl. Mech.* **39**, 3–10 (2009)
300. Stamova, I.M.: Impulsive control for stability of n -species Lotka–Volterra cooperation models with finite delays. *Appl. Math. Lett.* **23**, 1003–1007 (2010)
301. Stamova, I.M.: Lyapunov–Razumikhin method for impulsive differential equations with “supremum”. *IMA J. Appl. Math.* **76**, 573–581 (2011)
302. Stamova, I.M.: Eventual stability and eventual boundedness for impulsive differential equations with “supremum”. *Math. Model. Anal.* **16**, 304–314 (2011)
303. Stamova, I.M.: Existence and global asymptotic stability of positive periodic solutions of n -species delay impulsive Lotka–Volterra type systems. *J. Biol. Dyn.* **5**, 619–635 (2011)
304. Stamova, I.M., Akca, H., Stamov, G.T.: Qualitative analysis of dynamic activity patterns in neural networks. *J. Appl. Math.* **2011**, Article ID 208517 (2011)
305. Stamova, I.M., Eftekhar, J.: Razumikhin technique and stability of impulsive differential-difference equations in terms of two measures. *J. Concr. Appl. Math.* **2**, 233–248 (2004)
306. Stamova, I.M., Emmenegger, J.F., Stamov, A.G.: Stability analysis of an impulsive Solow–Swan model with endogenous population. *Int. J. Pure Appl. Math.* **65**, 243–255 (2010)
307. Stamova, I.M., Ilarionov, R.: On global exponential stability of impulsive cellular neural networks with time varying delays. *Comput. Math. Appl.* **59**, 3508–3515 (2010)
308. Stamova, I.M., Ilarionov, R., Krustev, K.: Asymptotic behavior of equilibriums of a class of impulsive bidirectional associative memory neural networks with time-varying delays. *Neural Comput. Appl.* **20**, 1111–1116 (2011)
309. Stamova, I.M., Ilarionov, R., Vaneva, R.: Impulsive control for a class of neural networks with bounded and unbounded delays. *Appl. Math. Comput.* **216**, 285–290 (2010)
310. Stamova, I.M., Stamov, A.G.: Impulsive control on the asymptotic stability of the solutions of a Solow model with endogenous labor growth. *J. Frankl. Inst.* **349**, 2704–2716 (2012)
311. Stamova, I.M., Stamov, A.G.: On the stability of the solutions of an impulsive Solow model with endogenous population. *Econ. Change Restruct.* **46**, 203–217 (2013)

312. Stamova, I.M., Stamov, G.T.: Lyapunov–Razumikhin method for impulsive functional differential equations and applications to the population dynamics. *J. Comput. Appl. Math.* **130**, 163–171 (2001)
313. Stamova, I.M., Stamov, G.T.: On the conditional stability of impulsive functional differential equations. *AMRX Appl. Math. Res. Express* **2006**, 1–13 (2006)
314. Stamova, I.M., Stamov, G.T.: Lyapunov–Razumikhin method for asymptotic stability of sets for impulsive functional differential equations. *Electron. J. Differ. Equ.* **2008**(2008), 1–10 (2008)
315. Stamova, I.M., Stamov, G.Tr.: Impulsive control on global asymptotic stability for a class of impulsive bidirectional associative memory neural networks with distributed delays. *Math. Comput. Model.* **53**, 824–831 (2011)
316. Stamova, I.M., Stamov, G.T.: On the stability of sets for delayed Kolmogorov-type systems. *Proc. Am. Math. Soc.* **142**, 591–601 (2014)
317. Stamova, I.M., Stamov, G.T.: Lipschitz stability criteria for functional differential systems of fractional order. *J. Math. Phys.* **54**, 043502 (2013)
318. Stamova, I.M., Stamov, G.Tr., Alzabut, J.O.: Global exponential stability for a class of impulsive BAM neural networks with distributed delays. *Appl. Math. Inf. Sci.* **7**, 1539–1546 (2013)
319. Stamova, I.M., Stamov, T.: Asymptotic stability of impulsive control neutral-type systems. *Int. J. Control* **87**, 25–31 (2014)
320. Stamova, I.M., Stamov, T., Li, X.: Global exponential stability of a class of impulsive cellular neural networks with supremums. *Int. J. Adapt. Control* **28**, 1227–1239 (2014)
321. Stamova, I.M., Stamov, T., Simeonova, N.: Impulsive control on global exponential stability for cellular neural networks with supremums. *J. Vib. Control* **19**, 483–490 (2013)
322. Stamova, I.M., Stamov, T., Simeonova, N.: Impulsive effects on the global exponential stability of neural network models with supremums. *Eur. J. Control* **20**, 199–206 (2014)
323. Sternberg, S.: *Celestial Mechanics, Part I*. W. A. Benjamin, New York (1969)
324. Sun, S.T., Chen, L.S.: Dynamic behaviors of Monod type chemostat model with impulsive perturbation on the nutrient concentration. *J. Math. Chem.* **42**, 837–848 (2007)
325. Taam, C.T.: Asymptotically periodic and almost periodic solutions of nonlinear differential equations in Banach spaces. Technical report, Georgetown University, Washington (1966)
326. Takeuchi, Y.: *Global Dynamical Properties of Lotka–Volterra Systems*. World Scientific, Singapore (1996)
327. Tarta, A.: Functional-differential equation with retarded argument. *Studia Univ. Babes-Bolyai* **52**, 109–115 (2007)
328. Teng, Z.: Persistence and stability in general nonautonomous single-species Kolmogorov systems with delays. *Nonlinear Anal. Real World Appl.* **8**, 230–248 (2007)
329. Teng, Z., Nie, L., Fang, X.: The periodic solutions for general periodic impulsive population systems of functional differential equations and its applications. *Comput. Math. Appl.* **61**, 2690–2703 (2011)
330. Ulussever, T.: A welfare policy analysis in the Turkish economy: a simulation based macroeconomic application of the deficit financing policies. *J. Frankl. Inst.* **348**, 1416–1434 (2011)
331. Veech, W.A.: Almost automorphic functions on groups. *Am. J. Math.* **87**, 719–751 (1965)
332. Volterra, V.: Fluctuations in the abundance of a species considered mathematically. *Nature* **118**, 558–560 (1926)
333. Wang, L., Chen, L., Nieto, J.J.: The dynamics of an epidemic model for pest control with impulsive effect. *Nonlinear Anal. Real World Appl.* **11**, 1374–1386 (2010)
334. Wang, L., Yu, M., Niu, P.: Periodic solution and almost periodic solution of impulsive Lasota–Ważewska model with multiple time-varying delays. *Comput. Math. Appl.* **64**, 2383–2394 (2012)
335. Ważewska-Czyżewska, M., Lasota, A.: Mathematical problems of the dynamics of a system of red blood cells. *Mat. Stos.* **6**, 23–40 (1976)

336. Wei, F., Wang, K.: Asymptotically periodic solution of n -species cooperation system with time delay. *Nonlinear Anal. Real World Appl.* **7**, 591–596 (2006)
337. Widjaja, J., Bottema, M.J.: Existence of solutions of diffusive logistic equations with impulses and time delay and stability of the steady-states. *Dyn. Contin. Discret. Impuls. Syst. Ser. A* **12**, 563–578 (2005)
338. Xia, Y.: Positive periodic solutions for a neutral impulsive delayed Lotka–Volterra competition system with the effect of toxic substance. *Nonlinear Anal. Real World Appl.* **8**, 204–221 (2007)
339. Xian, X., O'Regan, D., Agarwal, R.P.: Multiplicity results via topological degree for impulsive boundary value problems under non-well-ordered upper and lower solution conditions. *Bound. Value Probl.* Art. ID 197205 (2008)
340. Xinzhu, M.: Almost periodic solution for a class of Lotka–Volterra type N -species ecological systems with time delay. *J. Syst. Sci. Complex.* **18**, 488–497 (2005)
341. Xu, W., Li, J.: Global attractivity of the model for the survival of red blood cells with several delays. *Ann. Differ. Equ.* **14**, 357–363 (1998)
342. Xue, Y., Wang, J., Jin, Z.: The persistent threshold of single population under pulse input of environmental toxin. *WSEAS Trans. Math.* **6**, 22–29 (2007)
343. Yan, J.: Existence and global attractivity of positive periodic solution for an impulsive Lasota–Ważewska model. *J. Math. Anal. Appl.* **279**, 111–120 (2003)
344. Yan, P.: Impulsive SUI epidemic model for HIV/AIDS with chronological age and infection age. *J. Theor. Biol.* **265**, 177–184 (2010)
345. Yang, J., Yang, Z.: Stability and permanence of a pest management model with impulsive releasing and harvesting. *Abstr. Appl. Anal.* **2013**, Art. ID 832701 (2013)
346. Yang, T.: *Impulsive Control Theory*. Springer, Berlin (2001)
347. Yang, Y.: Establish of macroeconomics model with impulsive perturbation and analysis of its stability. In: *Proceedings of the IEEE 2010 International Conference on Computer Application and System Modeling*, Taiyuan, pp. V9-540–V9-543 (2010)
348. Yang, Y., Xu, D.: Stability analysis of delay neural networks with impulsive effects. *IEEE Trans. Circuits Syst.* **52**, 517–521 (2005)
349. Ye, D., Fan, M.: Periodicity in impulsive predator-prey system with Holling III functional response. *Kodai Math. J.* **27**, 189–200 (2004)
350. Yi, Z., Peng, P.A., Leung, K.S.: Convergence analysis of cellular neural networks with unbounded delay. *IEEE Trans. Circuits Syst. I* **48**, 680–687 (2001)
351. Yoshizawa, T.: *Stability Theory by Lyapunov's Second Method*. The Mathematical Society of Japan, Tokyo (1966)
352. Yoshizawa, T.: Asymptotically almost periodic solutions of an almost periodic system. *Funkcial. Ekvac.* **12**, 23–40 (1969)
353. Yoshizawa, T.: Some remarks on the existence and the stability of almost periodic solutions. *SIAM Stud. Appl. Math.* **5**, 166–172 (1969)
354. Zanolin, F.: Permanence and positive periodic solutions for Kolmogorov competing species systems. *Results Math.* **21**, 224–250 (1992)
355. Zhang, B.G., Gopalsamy, K.: Global attractivity in the delay logistic equation with variable parameters. *Math. Proc. Camb. Philos. Soc.* **170**, 579–590 (1990)
356. Zhang, F., Li, W., Huo, H.: Global stability of a class of delayed cellular neural networks with dynamical thresholds. *Int. J. Appl. Math.* **13**, 359–368 (2003)
357. Zhang, J.: Globally exponential stability of neural networks with variable delays. *IEEE Trans. Circuits Syst. I* **50**, 288–291 (2003)
358. Zhang, J., Suda, Y., Iwasa, T.: Absolutely exponential stability of a class of neural networks with unbounded delay. *Neural Netw.* **17**, 391–397 (2004)
359. Zhang, L., Teng, Z., Jiang, H.: Permanence for general nonautonomous impulsive population systems of functional differential equations and its applications. *Acta Appl. Math.* **110**, 1169–1197 (2010)
360. Zhang, Y., Sun, J.: Controlling chaotic Lu systems using impulsive control. *Phys. Lett. A* **342**, 256–262 (2005)

361. Zhao, C.J.: On a periodic predator-prey system with time-delays. *J. Math. Anal. Appl.* **331**, 978–985 (2007)
362. Zhao, H.: Global stability of bidirectional associative memory neural networks with distributed delays. *Phys. Lett. A* **30**, 519–546 (2002)
363. Zhao, Y., Xia, Y., Ding, W.: Periodic oscillation for BAM neural networks with impulses. *J. Appl. Math. Comput.* **28**, 505–423 (2008)
364. Zhikov, V.V.: The problem of almost periodicity for differential and operator equations. *Matematika* **8**, 94–188 (1969)
365. Zhong, W., Lin, W., Jiong, R.: The stability in neural networks with delay and dynamical threshold effects. *Ann. Differ. Equ.* **17**, 93–101 (2001)
366. Zhou, D., Cao, J.: Globally exponential stability conditions for cellular neural networks with time-varying delays. *Appl. Math. Comput.* **131**, 487–496 (2002)
367. Zhou, Q., Wan, L.: Impulsive effects on stability of Cohen–Grossberg-type bidirectional associative memory neural networks with delays. *Nonlinear Anal. Real World Appl.* **10**, 2531–2540 (2009)
368. Zhu, H., Zhu, Z., Wang, Q.: Positive almost periodic solution for a class of Lasota–Ważewska model with infinite delays. *Appl. Math. Comput.* **218**, 4501–4506 (2011)

A
 absolute continuity, 228
 active suppression, high amount, 24
 Allee effect, 113, 115
 almost periodic, 19, 39, 125
 almost periodic
 functions, 7, 19, 125
 in the sense of Bohr, 2
 piecewise continuous, 11, 23, 79
 sequence, 11, 19, 20
 set of sequences, 11
 solutions, 41, 94
 unique, 47, 50
 systems, 24, 25
 almost periodicity, 6
 almost periodicity, 127
 applied logistic mathematical models, 1, 2
 autoexcitatory Holling correlation, 217

B
 Burch space, 30
 basins, 14
 Bidirectional Associative Memory, 237
 Bidirectional Associative Memory neural networks, 208
 bipolar vector fields, 237
 biased covariance, 48, 51
 boundedness, 6, 11, 24

C
 capacity-labor ratio, 271, 285
 carrying capacity, 114
 Cauchy matrix, 19, 69, 116, 209
 cell biological systems, 16

C
 chaotic neural networks, 3
 closed-loop systems, delayed variables, 274
 Cohen–Grossberg production function, 279, 284
 coexistence cycles, 19
 coexistence domain theory, 11, 29
 column domain, 95
 comparison equation, 46
 comparison lemma, 37
 comparison system, 35
 competitive interactions, 42
 conditional stability, 54
 continuity
 globally and asymptotically stable, 54, 56
 globally asymptotically stable, 54, 56
 stable, 54, 55, 60, 61
 uniformly globally asymptotically stable,
 54, 56
 uniformly globally attractive, 54, 56
 uniformly stable, 54, 55
 unstable, 54, 56
 constructive weights, 238
 continuity, 41, 13
 in the L^1 , 14
 variation, 14
 vector field, 13
 Convolution Theorem, 36
 covariance matrices, 48
 covariance-covariance, 16
 covariance-covariance, 16
 covariance-covariance, 16

D
 delay, 274, 285
 delay, 274, 285
 dynamics
 phase, 6