Toma, Alexandru; **Morarescu, Cristian**
Detection of short-step pulses using practical test-functions and resonance aspects. (English)
Zbl 1162.93385
Math. Probl. Eng. 2008, Article ID 543457, 15 p. (2008).

Summary: An important aspect in modeling dynamic phenomena consists in measuring with higher accuracy some physical quantities corresponding to the dynamic system. Yet for measurements performed on limited time interval at high working frequency, certain intelligent methods should be added. The high working frequency requires that the measurement and data processing time interval should be greater than the time interval when the step input is received, so as to allow an accurate measurement. This paper will show that an intelligent processing method based on oscillating second-order systems working on limited time interval can differentiate between large step inputs (which are active on the whole limited time interval) and short step inputs (which are active on a time interval shorter than the limited working period). Some resonance aspects (appearing when the input frequency is close to the working frequency of the oscillating second-order system) will be also presented.

MSC:

93C83	Control/observation systems involving computers (process control, etc.)
93E10	Estimation and detection in stochastic control theory

Cited in **2** Documents

Keywords:

modeling dynamic phenomena; intelligent processing method; oscillating second-order system

Full Text: DOI EuDML

References:

[1] C. Toma, "An extension of the notion of observability at filtering and sampling devices," in Proceedings of the International Symposium on Signals, Circuits and Systems (ISSCS /05), p. 233, Iasi, Romania, July 2005. · Zbl 1117.65179 · doi:10.1080/13926292.2006.9637307

[2] Y. Sun and J. K. Fidler, "Synthesis and performance analysis of universal minimum component integrator-based IFLF OTA-grounded capacitor filter," IEE Proceedings: Circuits, Devices and Systems, vol. 143, no. 2, pp. 107-114, 1996. · Zbl 0875.94124 · doi:10.1049/ip-cds:19960307

[3] S. L. Smith and E. Sánchez Sinencio, "Low voltage integrators for high frequency cmos filters using current mode techniques," IEEE Transactions on Circuits and Systems II, vol. 43, no. 1, pp. 39-48, 1996.· doi:10.1109/82.481473

[4] C. Cattani and J. Rushchitsky, Wavelet and Wave Analysis as applied to Materials with Micro or Nanostructure, vol. 74 of Series on Advances in Mathematics for Applied Sciences, World Scientific, Singapore, 2007. · Zbl 1117.65179 · doi:10.1080/13926292.2006.9637307

[5] C. Cattani, "Connection coefficients of Shannon wavelets," Mathematical Modelling and Analysis, vol. 11, no. 2, pp. 117-132, 2006. · Zbl 1117.65179 · doi:10.1080/13926292.2006.9637307

[6] G. Toma, "Practical test-functions generated by computer algorithms," in Proceedings of the International Conference on Computational Science and Its Applications (ICCSA /05), vol. 3482 of Lecture Notes in Computer Science, pp. 576-584, Singapore, May 2005. · Zbl 05377784 · doi:10.1007/11424857$_6$2

[7] S. Pusca, "Invariance properties of practical test-functions used for generating asymmetrical pulses," in Proceedings of the International Conference on Computational Science and Its Applications (ICCSA /06), vol. 3980 of Lecture Notes in Computer Science, pp. 763-770, Glasgow, UK, May 2006. · Zbl 05497902 · doi:10.1007/11751540$_8$2

[8] A. Toma, S. Pusca, and C. Morarescu, "Spatial aspects of interaction between high-energy pulses and waves considered as suddenly emerging phenomena," in Proceedings of the International Conference on Computational Science and Its Applications (ICCSA /06), vol. 3980 of Lecture Notes in Computer Science, pp. 839-846, Glasgow, UK, May 2006. · Zbl 05497911 · doi:10.1007/11751540$_9$1

[9] E. Smeu, "Fast photodetectors speed-related problems," Romanian Journal of Optoelectronics, vol. 11, no. 1, p. 63, 2003. · Zbl 1117.65179 · doi:10.1080/13926292.2006.9637307

[10] M. Li and S. C. Lim, "Modeling network traffic using generalized Cauchy process," Physica A, vol. 387, no. 11, pp. 2584-2594, 2008.· doi:10.1016/j.physa.2008.01.026