Applying Fixed Parameters ’ and Random Parameters ’ Filters in Tracking Systems

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ABSTRACT

Filtering technique plays an important role in radar tracking systems. It is used to do the computation of both tracking prediction and estimation. It also can offer the information for other tracking procedures such as data association and maneuvering adaptive procedure, etc. Two kinds of filters which are fixed parameters and random parameters, are analyzed in this thesis. Moreover, we also apply both filtering techniques to radar target tracking systems. According to the computer simulation results, the filter with random parameters has better performance.

Keywords : Filtering technique、Fixed parameter filter、random parameter filter、radar target tracking system.

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REFERENCES

[1]Samuel S. Blackman, “ Multiple-Target Tracking with Radar Applications ” .

[2]Bar-Shalom, Y., “ Tracking Methods in a Multi-target Environment ” , IEEE Trans. Automa. Contr., Vol. Ac-23, pp. 618-626, Aug 1978.

[3]Emre, E. and Aeo, J., “ A Unifying approach to Multi-Target Tracking ” , IEEE Trans. Aerosp. Electron. Syst., Vol. AES-25, pp. 520-528, July. 1989.

[4]Gish, H. and Mucci, Ronald, “ Target state Estimation in a Multi-target Enviroment Using Multiple Sensors ” , IEEE Trans. Aerosp. Electron. Syst., Vol. AES-23, pp. 60-72,jan. 1987.

[5]Brumback, B.D. and Srinath, M.D., “ A Fault-Torlerant Multisensor Navigation System Desgin ” , IEEE Trans. Aerosp. Electron. Syst., Vol. AES-23, pp. 738-755, Nov. 1987.

[6]Magarini, M. and Spalvieri, A., “ Optimization of decentralized quantizers in rate constrained data fusion systems ” , Geoscience and Remote Sensing Symposium, 2000. Proceedings. IGARSS 2000. IEEE 2000 International , Volume: 3 , 24-28 July 2000.

[7]Koval, V., “ The competitive sensor fusion algorithm for multi sensorsystems ” , Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications, International Workshop on., 2001. , 1-4 July 2001.

[8]Vershinin, Y.A. and West, M.J., “ A new data fusion algorithm based on the continuous-time decentralized Kalman filter ” , Target Tracking: Algorithms and Applications (Ref. No. 2001/174), IEE , Volume: 1 , 16-17 Oct. 2001.

[9] Vershinin, Y.A., “ A data fusion algorithm for multisensor systems ” , Information Fusion, 2002. Proceedings of the Fifth International Conference on , Volume: 1 , 8-11 July 2002.

[10]Weixian Liu and Yilong Lu and Fu, J.S., “ Data fusion of multiradar system by using genetic algorithm ” , Aerospace and Electronic Systems, IEEE Transactions on , Volume: 38 , Issue: 2 , April 2002.

[11]Yu Xu and Yihui Jin and Yan Zhou, ” Several methods of radar data fusion ” , Electromagnetic Compatibility, 2002 3rd International Symposium on , 21-24 May 2002.

[11]Jae-Jun Kim and Singh, T. and Llinas, J., “ Large scale simulation of a distributed target tracking system ” , Information Fusion, 2002. Proceedings of the Fifth International Conference on , Volume: 1 , 8-11 July 2002.

[12]Benaskeur, A.R., “ Consistent fusion of correlated data sources ” , IECON 02 [Industrial Electronics Society, IEEE 2002 28th Annual Conference of the] , Volume: 4 , 5-8 Nov. 2002.

[13]Guosheng Yang and Feng Zhu and Lihua Dou, “ An engineering method for multi-sensor track fusion ” , Autonomous Decentralized System, 2002. The 2nd International Workshop on , 6-7 Nov. 2002.

[14]McErlean, D. and Narayanan, S., ” Distributed detection and tracking in sensor networks ” , Signals, Systems and Computers, 2002. Conference Record of the Thirty-Sixth Asilomar Conference on , Volume: 2 , 3-6 Nov. 2002.

[15]Mort, N. and Prajitno, P., “ A multisensor data fusion-based target tracking system ” , Industrial Technology, 2002. IEEE ICIT '02. 2002 IEEE International Conference on , Volume: 1 , 11-14 Dec. 2002.

[16]Jie Tian and Jie Chen and Lihua Dou and Yuhe Zhang, “ The research of test and evaluation for multisensor data fusion systems ” , Intelligent Control and Automation, 2002. Proceedings of the 4th World Congress on , Volume: 3 , 10-14 June 2002.

[17]Jin Xue-bo and Sun You-xian, “ Optimal fusion estimation covariance of multisensor data fusion on tracking problem ” , Control Applications, 2002. Proceedings of the 2002 International Conference on , Volume: 2 , 18-20 Sept. 2002.

[18]Xue-bo Jin and You-xian Sun, “ Optimal estimation for multisensor data fusion system with correlated measurement noise ” , Signal Processing, 2002 6th International Conference on , Volume: 2 , 26-30 Aug. 2002.

[19]Chamberland, J.-F. and Veeravalli, V.V., ” Decentralized detection in sensor networks ” , Signal Processing, IEEE Transactions on [see also Acoustics, Speech, and Signal Processing, IEEE Transactions on] , Volume: 51 , Issue: 2 , Feb. 2003.

[20]Khawsuk, W. and Pao, L.Y., “ Decorrelated state estimation for distributed tracking using multiple sensors in cluttered environments ” , American Control Conference., 2003. Proceedings of the 2003 , Volume: 4 , June 4-6, 2003.

[21]Huimin Chen and Kirubarajan, T. and Bar-Shalom, Y., ” Performance limits of track-to-track fusion versus centralized estimation: theory and application [sensor fusion] ” , Aerospace and Electronic Systems, IEEE Transactions on , Volume: 39 , Issue: 2 , April 2003.