多攝影機監控下之多物體移動追蹤

劉威志、曾逸鴻

E-mail: 9608110@mail.dyu.edu.tw

摘 要

「視覺」是人類最重要的感知系統，也最相信視覺所提供的 訊息。目前大多數的公司、機構、社區、路口乃至居家環境內， 隨處可見俗稱「監視攝影機」的視訊擷取設備。利用視訊當作現 場訊息的紀錄媒介，以應用在危險行為的預防、犯罪嫌疑的緝捕 與軍事安全的防護等，一直是全世界的注意焦點。為建構視覺技 術為基礎之智慧型環境，本研究著重在多重室內空間的安全監控 。為了明確偵測並追蹤空間內的多重移動物體，可利用多重攝影 機在不同位置、不同角度拍攝同一保全空間，即時做到同步監控 追蹤，並自動交錯選擇最清楚的拍攝畫面，記錄各物體的移動狀 況。 本研究主要分成三個部份，第一部份是在相同空間內，多移 動物體有互相遮蔽的情形發生時，可利用不同攝影機的切換，取 得最好的監控畫面以做追蹤；第二部份是被追蹤物在不同的相鄰 空間移動時，能夠接續追蹤；第三部份則是當被追蹤物在兩亮度 差異明顯空間移動時，得以順利持續追蹤。

關鍵詞 : 多攝影機，遮蔽，視訊監控系統，移動物體偵測

目錄

參考文獻

[1]Anurag, M., & LARRY, S. D. (2003). M2Tracker: A multi-view approach to segmenting and tracking peoplein a cluttered scene. International journal of computer vision ,51(3), 189 – 203.

[2]Bernt, S. (2000). Model-free tracking of cars and people based on color regions, Image and Vision Computing, 24(11),1172 – 1178.

[3]Blake, A., & Isard, M. (1994). 3d position, altitude and shape input u sing video tracking of hands and lips. Computer graphics, Siggraph, 71-78.

[4]Bowden, R., & KaewTraKulPong, P. (2004). Towards automated wide area visual surveillance: tracking objects between spatially-separated, uncalibrated views. Vision, Image and Signal Processing, IEE Proceedings , 152(2), 213-223.

[5]Collins, R. T., Lipton, A. J., Kanade, T., Fujiyoshi, H., Duggins, D., Tsin, Y., Tolliver, D., Enomoto, N., Hasegawa, O., Burt, P., & Wixson, L. (2000). A system for video surveillance and monitoring. CMU-RI-TR-00-12.

[6]Chachich, A. C. Pau, A.. Barber, A. Kennedy, K. Olejniczak, E. Hackney, J., Sun, Q., & Mireles, E. (1996). Traffic sensor using a [7]color vision method. Spie—transportation sensors and controls: Collision avoidance, traffic management, and ITS, 2902, 156 – 165.

[8]Christopher, O. J.(2004). Multi-view calibration from planar motion trajectories. Image vision computing,22(7) ,535-550.

[9]Christopher, W., Ali A., Trevor, D., & Alex, P. (1997). Pfinder:real-time tracking of the human body. IEEE trans. pattern anal. machine intell, 19, 780 – 785.

[10]Coifman, B., Beymer, D., McLauchlan, P., & Malik, J. (1998). A real-time computer vision system for vehicle tracking and traffic surveillance, Transportation Research, 6(4), 271 – 288.

[11]Elgammal, A., Harwood, D., & Davis, L. (2000). Non-parametric model for background subtraction. Proceeding of 6th European Conference on Computer Vision.

[12]James B., & Tim, E. (2005). Multi camera image tracking. ISSN (online) 0262-8856, 24(11), 1256-1267.

[13]Ju, S., Black, M., & Yaccob, Y. (1996). Cardboard people: a parameterized model of articulated image motion. IEEE Int. Conf. Automatic Face and Gesture Recognition, 38 – 44.

[14]Karaulova, I. A., Hall, P. M., & Marshall, A. D. (2000). A hierarchical model of dynamics for tracking people with a single video camera.

British Machine Vision Conference, 252 – 361.
[15]Malik, J. & Russell, S.(1996). Traffic Surveillance And Detection [16]Technology Development: New Traffic Sensor Technology Final Report. no. UCB-ITS-PRR-97-6.
[17]McKenna,S. J., Jabri, S., Duric,Z.,Rosenfeld,A.,& Wechsler,H.(2000). Tracking groups of people. Computer Vision and Image Understanding, 80(1), 42 – 56.
[18]Mittal, A.,& Davis, L. S.(2001). Unified multi-camera detection and tracking using region-matching. IEEE workshop on multi-object tracking, vancouver, canada, 3-10.
[19]Nam, T.N., Svetha,V., Geoff,W., & Hung,H.B.(2003). Multiple camera coordination in a surveillance system. Acta automatica sinica , 29(3), 408-422.
[20]Nam, T. N., Svetha,V., Geoff,W ., & Hung,H .B.(2003). Multiple walking figures in XYT. IEEE conf. computer vision and pattern recognition, 469 – 474.
[21]Ohta, N.(2001). A statistical approach to background subtraction for surveillance systems. IEEE International Conference on Computer Vision, 2, 481 – 486.
[22]Paragios N., & Deriche R.(2000).Geodesic active contours and level sets for the detection and tracking of moving objects. IEEE Transactions on Pattern Analysis and Machine Intelligence, 22, 266-280.
[23]Polana ,R., & Nelson, R.(1994). Low level recognition of human motion. Proc. IEEE Workshop on Nonrigid and Articulate Motion, 77 – 82.
[24]Rowley, H.A.,& Rehg, J.M.(1997) Analyzing articulated motion using expectation-maximization. Proceedings of the IEEE Workshop on Applications of Computer Vision, (pp. 935-94San Juan, Puerto Rico.
[25]Seki, M., Fujiwara, H., & sumi, K. (2000). A robust background subtraction method for changing background. Proceeding of Fifth IEEE Workshop on Applications of Computer Vision, 207 – 213.
[26]Terzopoulos, D., & Szeliski,R.(1992).Tracking with kalman snakes. Active vision, 3-20.
[27]Welch,G., & Bishop,G.(2001).An introduction to the kalman filter Department of Computer Science University of North Carolina at Chapel Hill Chapel Hill, TR-95-041.
[28]Tseng, Y.H.,& Xiao, H.Z.(2005) Background model construction and maintenance in a video surveillance system, Proceedings of the 18th Conference on Computer Vision, Graphics and Image Processing, 303-309.
[29]Zang, Q., & Klette, R.(2004). Robust background subtraction and maintenance. Pattern Recognition, 2 , 23-26.