

植基於畢諾掃瞄與差值特性之可逆資訊隱藏研究

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摘要

近年來資訊隱藏在資訊網路安全領域受到矚目，它包括把秘密資訊隱藏在網路上的文字、影像、聲音、視訊檔案之中。其中，可逆資訊隱藏廣受歡迎，已經成為人們研究的重點，並且用它來實現多媒體版權保護的重要方式。

在本論文中，將研究畢諾掃瞄應用到差值擴展、直方圖技術、絕對動量保留區塊截短碼。實驗結果顯示，本文的方法相較於其它的方法，可以大幅的提昇資訊嵌入容量，仍然維持良好的偽裝影像品質。

關鍵詞：絕對動量保留區塊截短碼 直方圖技術 差值擴展 可逆資訊隱藏 畢諾掃瞄 絕對動量保留區塊截短碼 直方圖技術 差值擴展 可逆資訊隱藏 畢諾掃瞄

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參考文獻

- [1]Lute K., Senior M., and Henk J. A. M. H., " Reversible data embedding into images using wavelet techniques and sorting, " IEEE transactions on image processing, vol. 14, pp. 2082-2090, Dec. 2005.
- [2]Chang C. C., and Lu T. C., " A difference expansion oriented data hiding scheme for restoring the original host images, " The Journal of Systems & Software, vol. 79, pp. 1754-1766, May 2006.
- [3]Lin C. C., Yang S. P., and Hsueh N. L., " Lossless data hiding based on difference expansion without a location map, " Image and Signal Processing Congress on, vol. 2, pp. 8-12, 27-30 May 2008.
- [4]Liu C. L., Lou D. C., and Lee C. C., " Reversible data embedding using reduced difference expansion, " Intelligent Information Hiding and Multimedia Signal Processing, vol. 1, pp. 433-436, 26-28, Nov. 2007.
- [5]Weng S., Zhao Y., Pan .S., and Ni R., " A novel reversible watermarking based on an integer transform, " IEEE International Conference on Image Processing, vol. 3, pp. III - 241-III - 244, Oct. 2007.
- [6]Lee C. C., Wu H. C., Tsai C. S., and Chu Y. P., " Adaptive lossless steganographic scheme with centralized difference expansion, " Pattern Recognition, vol. 41, pp. 2097-2106, 2008.
- [7]Alattar A. M., " Reversible watermark using the difference expansion of a generalized integer transform, " IEEE Transactions on Image Processing, vol. 13, pp. 1147-1156, Aug. 2004.
- [8]Tsai H. M., and Chang L. W., " Adaptive multilayer reversible data hiding using the near-to-pixel difference modification, " IEEE International Conference on Multimedia and Expo, pp. 2102-2105, 2-5, July 2007.
- [9]Alattar A. M., " Reversible watermark using difference expansion of quads, " IEEE International Conference on Acoustics, Speech, and Signal Processing, vol. 3, pp. III - 377-80, 17-21, May 2004.
- [10]Alattar A. M., " Reversible watermark using difference expansion of triplets, " International Conference on Image Processing, vol. 1, pp. I - 501-4, 14-17, Sept. 2003
- [11]Xuan G., Shi Y. Q., Ni Z. C., Chen J., Yang C., Zhen Y., and Zheng J., " High capacity lossless data hiding based on integer wavelet transform, " Proceedings of the 2004 International Symposium on Circuits and Systems, vol. 2, pp. II - 29-32, 23-26, May 2004.
- [12]Ni Z., Shi Y. Q., Ansari N., and Su W., " Reversible data hiding, " IEEE Trans. on Circuits and Systems for Video Technology, vol. 16, pp. 354-362, March 2006.
- [13]Lin C. C., Member, and Hsuen N. L., " Hiding Data Reversibly in an Image via Increasing Differences between Two Neighboring Pixels, " IEICE Trans. on Information and Systems, vol. E90-D, pp. 2053-2059, Dec. 2007.
- [14]Kuo W. C., Jiang D. J., and Huang Y. C., " A reversible data hiding scheme based on block division, " Image and Signal Processing , 2008. CISP '08. Congress on, vol. 1, pp. 365-369, 2008.
- [15]Lin C. C., and Hsueh N. L., " A Lossless data hiding scheme based on three-Pixel block difference, " Pattern Recognition, vol. 41, pp. 1415-1425, 2008.
- [16]Fallahpour M., and Sedaaghi M. H., " High capacity lossless data hiding based on histogram modification, " IEICE Electronics Express, vol. 4, pp. 205-210, April 2007.
- [17]Kuo W. C., and Lin Y. H., " On the security of reversible data hiding based-on histogram shift, " the 3rd International Conference on Innovative Computing Information and Control, pp. 174-177, Nov. 2008.
- [18]Celik M. U., Sharma G., Tekalp A. M., and Saber E., " Lossless generalized-LSB data embedding, " IEEE Trans. Image Process., vol. 4, pp. 253-266, 2005.
- [19]Ansari A., and Fineberg A., " Image data ordering and compression using Peano scan and Lot, " IEEE Trans. on Consumer Electronics, vol. 38, pp. 436-445, Aug. 1992.
- [20]Tian J., " Reversible data embedding using a difference expansion, " IEEE Trans. on Circuits and Systems for Video Technology, vol. 13, pp. 890-896, Aug. 2003.
- [21]Delp E. J., and Mitchell O.R., " Image compression using block truncation coding, " IEEE Trans. Commun, vol. 27, pp. 1335-1341, 1979.
- [22]蔡文輝, 林家禎, 張真誠, " 資訊壓縮技術與應用, " 全華圖書股份有限公司, 2007.
- [23]Lema M. D and Mitchell O. R., " Absolute Moment Block Truncation coding and Its Applications to Color Images, " IEEE Trans. Commun, vol. COM-32, pp. 1148-1157, Oct. 1984.
- [24]Chang C. C., Chen Y. H., and Lin C. C., " A data embedding scheme for color images based on genetic algorithm and absolute moment block truncation coding, " Soft Computing, vol. 13, pp. 321-331, 2009.

[25]戴顯權,“資料壓縮,”紳藍出版社,2002