August 2025: Top 10 Cited Articles

Signal & Image Processing : An International Journal (SIPIJ)

Signal & Image Processing :An International Journal (SIPIJ)

*****WJCI Indexed*****

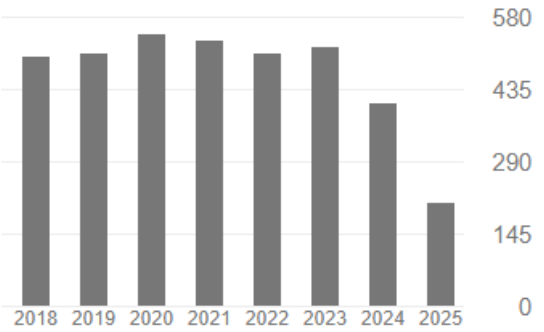
ISSN: 0976–710X[Online];2229–3922[Print]

https://www.airccse.org/journal/sipij/index.html

GET MY OWN PROFILE

Cited by VIEW ALL

	All	Since 2020
Citations	6254	2726
h-index	35	21
i10-index	130	57



A Review Paper : Noise Models in Digital Image Processing

Ajay Kumar Boyat and Brijendra Kumar Joshi,

Military College of Tele Communication Engineering, India

ABSTRACT

Noise is always presents in digital images during image acquisition, coding, transmission, and processing steps. Noise is very difficult to remove it from the digital images without the prior knowledge of noise model. That is why, review of noise models are essential in the study of image denoising techniques. In this paper, we express a brief overview of various noise models. These noise models can be selected by analysis of their origin. In this way, we present a complete and quantitative analysis of noise models available in digital images.

KEYWORDS

Noise model, Probability density function, Power spectral density (PDF), Digital images.

Volume URL : https://www.airccse.org/journal/sipij/vol6.html

Source URL : https://aircconline.com/sipij/V6N2/6215sipij06.pdf

REFERENCES

[1] Gonzalez R. C., & Woods R. E. (2002) "Digital Image Processing," second ed., Prentice Hall, Englewood, Cliffs, NJ.

[2] Bovick A. (2000) "Handbook of Image and Video processing," Acedemic press, New York.

[3] Patil, J. & Jadhav S. (2013) "A Comparative Study of Image Denoising Techniques," International Journal of Innovative Research in Science, Engineering and Technology, Vol. 2, No. 3.

[4] Dougherty G. (2010) "Digital Image Processing for Medical Applications," second ed., Cambridge university press.

[5] Boyat, A. and Joshi, B. K. (2013) "Image Denoising using Wavelet Transform and Median Filtering', IEEE Nirma University International Conference on Engineering," Ahemdabad.

[6] Astola J. & Kuosmanen P. (1997) "Fundamentals of nonlinear digital filtering," CRC Press, Boca Raton. [7] Mallet S. (1998) "A Wavelet Tour of Signal Processing," Academic Press, New York.

[8] Catipovic M. A., Tyler P. M., Trapani J. G., & Carter A. R., (2013) "Improving the quantification of Brownian motion," American Journal of Physics, Vol. 81 No. 7 pp. 485-491.

[9] Bhattacharya J. K., Chakraborty D., & Samanta H. S., (2005) "Brownian Motion - Past and Present," Cornall university library. arXiv:cond-mat/0511389

[10] Radenovic A., "Brownian motion and single particle tracking," Advanced Bioengineering methods laboratory, Ecole polyteachenique federal de Lausanne.

AUTHORS

Ajay Boyat is a Research scholar in Electronics & Telecommunication and Computer Engineering Department at Military College of Telecommunication Engineering (MCTE), Military Head Quarter of War (MHOW), M.P., India. He has completed B.E. in Electronics and Communication Engineering from MITS, Gwalior in 2005, M.E. in Electronics and Telecommunication Engineering from SGSITS, Indore in 2008 and Currently Pursuing Ph.D. in Electronics and Telecommunication Engineering from Devi Ahiliya University, Indore. His research interests are Image processing, Adaptive and Non-Linear Filtering, Signal Processing, Mobile adhoc and Wireless Communication networks. He has number of research papers to his credit and has supervised three Post Graduate scholar and currently supervising three Post Graduate scholars. He has 09 years of teaching experience. He is Research and Project Cordinator in Department of Electronics & Communication Engineering at Medi-Caps Institute of Technology and Management, Indore (MP), India. He is a Global member of Internet Society. Recently he won the Best paper award Rank 1 in track 5 in 2014 IEEE ICCIC from IEEE PODHIGAI and IEEE-SIPCICOM.

Dr. Brijendra Kumar Joshi is a Professor in Electronics & Telecommunication and Computer Engineering Department at Military College of Telecommunication Engineering (MCTE), Military Head Quarter of War (MHOW), M.P., and India. Dr. Joshi, Fellow IETE India and IE(I). He is Life time Senior Member of CSI and Life Member of ISTE. He is Member of Cryptology Research Society of India (CRSI) and Member of IEEE, IEEE Communication Society and ACM (USA). He has completed B.E. in Electronics and Telecommunication Engineering from Govt. Engineering. College, Jabalpur, M.E. in Computer Science and Engineering from Indian Institute of Science, Bangalore, Ph.D. in Electronics and Telecommunication Engineering from Rani Durgavati University, Jabalpur and M. Tech. in Digital Communication from MANIT, Bhopal. His research interests are Programming Languages, Compiler Design, Digital Communications, Mobile adhoc and Wireless Sensor Networks, Signal Processing, Parallel Computing and Software Engineering. He has number of research papers to his credit and has supervised three PhD scholars and currently supervising eight PhD scholars. He has published two books on Data Structures and Algorithms with Tata McGraw-Hill. He has 30 years of teaching experience.

Content Based Image Retrieval Using Color and Texture

Manimala Singha and K. Hemachandran

Assam University, India

ABSTRACT

The increased need of content based image retrieval technique can be found in a number of different domains such as Data Mining, Education, Medical Imaging, Crime Prevention, Weather forecasting, Remote Sensing and Management of Earth Resources. This paper presents the content based image retrieval, using features like texture and color, called WBCHIR (Wavelet Based Color Histogram Image Retrieval).The texture and color features are extracted through wavelet transformation and color histogram and the combination of these features is robust to scaling and translation of objects in an image. The proposed system has demonstrated a promising and faster retrieval method on a WANG image database containing 1000 general-purpose color images. The performance has been evaluated by comparing with the existing systems in the literature.

Keywords

Image Retrieval, Color Histogram, Color Spaces, Quantization, Similarity Matching, Haar Wavelet, Precision and Recall.

Volume URL : https://www.airccse.org/journal/sipij/vol3.html

Source URL : https://aircconline.com/sipij/V3N1/3112sipij04.pdf

REFERENCES

1. R. Datta, D. Joshi, J. Li and J. Z. Wang, “Image retrieval: Ideas, influences, and trends of the new age”, ACM computing Survey, vol.40, no.

2, pp.1-60, 2008. 2. J. Eakins and M. Graham, “Content-Based Image Retrieval”, Technical report, JISC Technology Applications Programme, 1999.

3. Y. Rui, T. S. Huang and S.F. Chang, “Image Retrieval: Current Techniques, Promising Directions and Open Issues. Journal of Visual Communication and Image Representation. 10

(4): pp. 39-62. 1999. 4. A. M. Smeulders, M. Worring and S. Santini, A. Gupta and R. Jain, “Content Based Image Retrieval at the End of the Early Years”, IEEE Transactions on Pattern Analysis and Machine Intelligence, 22(12): pp. 1349-1380, 2000.

5. Y. Liu, D. Zang, G. Lu and W. Y. Ma, “A survey of content-based image retrieval with high-level semantics”, Pattern Recognition, Vol-40, pp-262-282, 2007.

6. T. Kato, “Database architecture for content-based image retrieval”, In Proceedings of the SPIE - The International Society for Optical Engineering, vol.1662, pp.112-113, 1992.

7. M. Flickner, H Sawhney, W. Niblack, J. Ashley, Q. Huang, B. Dom, M. Gorkani, J. Hafne, D. Lee, D. Petkovic, D. Steele and P. Yanker, “Query by Image and Video Content The QBIC System” IEEE Computer, pp-23-32, 1995.

8. A. Gupta and R. Jain. Visual information retrieval, Communications of the ACM 40 (5), 70–79. 1997.

9. A. Pentland, R.W. Picard and S. Scaroff, “Photobook: Content-Based Manipulation for Image Databases”, International Journal of Computer Vision 18 (3), pp233–254. 1996.

10. J. R. Smith and S.F. Chang, “VisualSEEk: a fully automated content-based image query system”, ACM Multimedia, 1996.

AUTHORS

Ms. Manimala Singha received her B.Sc. and M.Sc. degrees in Computer Science from Assam University, Silchar in 2005 and 2007 respectively. Presently she is working, for her Ph.D., as a Research Scholar and her area of interest includes image segmentation, feature extraction, and image searching in large databases.

Prof. K. Hemachandran is associated with the Dept. of Computer Science, Assam University, Silchar, since 1998. He obtained his M.Sc. Degree from Sri Venkateswara University, Tirupati and M.Tech. and Ph.D. Degrees from Indian School of Mines, Dhanbad. His areas of research interest are Image Processing, Software Engineering and Distributed Computing.

Algorithm and Technique on Various Edge Detection : A Survey

Rashmi, Mukesh Kumar and Rohini Saxena,

SHIATS, India

ABSTRACT

An edge may be defined as a set of connected pixels that forms a boundary between two disjoints regions. Edge detection is basically, a method of segmenting an image into regions of discontinuity. Edge detection plays an important role in digital image processing and practical aspects of our life. .In this paper we studied various edge detection techniques as Prewitt, Robert, Sobel, Marr Hildrith and Canny operators. On comparing them we can see that canny edge detector performs better than all other edge detectors on various aspects such as it is adaptive in nature, performs better for noisy image, gives sharp edges , low probability of detecting false edges etc.

KEYWORDS

Edges, Edge detection, Canny edge detection.

Volume URL : https://www.airccse.org/journal/sipij/vol4.html

Source URL : https://aircconline.com/sipij/V4N3/4313sipij06.pdf

REFERENCES

[1] James Clerk Maxwell,1868 DIGITAL IMAGE PROCESSING Mathematical and Computational Methods. [2] R .Gonzalez and R. Woods, Digital Image Processing, ,Addison Wesley, 1992, pp 414 - 428.

[3] S. Sridhar, Oxford university publication. , Digital Image Processing.

[4] Shamik Tiwari , Danpat Rai & co.(P) LTD. "Digital Image processing"

[5] J. F. Canny. "A computational approach to edge detection". IEEE Trans. Pattern Anal. Machine Intell., vol.PAMI-8, no. 6, pp. 679-697, 1986 Journal of Image Processing (IJIP), Volume (3) : Issue (1)

[6] Geng Xing, Chen ken , Hu Xiaoguang "An improved Canny edge detection algorithm for color image" IEEE TRANSATION ,2012 978-1-4673-0311-8/12/$31.00 ©2012 IEEE.

[7] Yuesong Mei, Jianqiao Yu " An Algorithm for Automatic Extraction of Moving Object in the Image Guidance", IEEE, International Conference on Intelligent System Design and Engineering Application,2010.978-0-7695-4212-6/10 $26.00 © 2010 IEEE DOI 10.1109/ISDEA.2010.253

[8] Xiaogbin Wang, Baokui Li, Qingbo Geng , "Runway Detection and Tracking for Unmanned Aerial Vehicle Based on an Improved Canny Edge Detection Algorithm"IEEE, 4th International Conference on Intelligent Human-Machine Systems and Cybernetics, 2012. 978-0-7695-4721-3/12 $26.00 © 2012 IEEE DOI 10.1109/IHMSC.2012.132

[9] Sos Agaian, Ali Almuntashri "Noise-Resilient Edge Detection Algorithm for Brain MRI Images", IEEE , 31st Annual International Conference of the IEEE EMBS Minneapolis, Minnesota, USA, September 2-6, 2009.978-1-4244-3296-7/09/$25.00 ©2009 IEEE.

[10] Fan Chun-ling, Wang Dao-he "The Application of Adaptive Canny Algorithm in the Cable Insulation Layer Measurement" IEEE, Second International Workshop on Computer Science and Engineering, 978-0-7695-3881-5/09 $26.00 © 2009 IEEE DOI 10.1109/WCSE.2009.177

AUTHORS

Rashmi is doing Masters in Engineering From Digital Signal Processing Specialization, in Electronics And Communications, From SHIATS Allahabad, (U.P.). Her field of interest is focused on digital image processing. Email- rasmishubh@gmail.com Mobile: +91-8953803830.

Mukesh Kumar is working as a Asst. Prof. in the Department of Electronics & Communication Engineering in SHIATS, Allahabad. He received his M.Tech. Degree in Advanced Communication System Engineering from SHIATS, Allahabad in 2010. His research is focused on Signal processing, Wireless Sensor Network and Computer Networks ,Microwave Engineering, as well as Optical fiber communication. Email- mukesh044@gmail.com, Mobile: +91-9935966111

Rohini Saxena is working as a Asst. Prof. in the Department of Electronics & Communication Engineering in SHIATS, Allahabad. She received her M.Tech. Degree in Advanced Communication System Engineering from SHIATS, Allahabad in 2009. Her research is focused on Signal processing, Microwave Engineering, Wireless Sensor Network and Computer Networks and Mobile communication. Email- rohini.saxena@gmail.com, Mobile: +91-9208548881

Histopathological Image Analysis Using Image Processing Techniques: An Overview

A. D. Belsare and M. M. Mushrif

Yeshwantrao Chavan College of Engineering, India

ABSTRACT

This paper reviews computer assisted histopathology image analysis for cancer detection and classification. Histopathology refers to the examination of invasive or less invasive biopsy sample by a pathologist under microscope for locating, analyzing and classifying most of the diseases like cancer. The analysis of histoapthological image is done manually by the pathologist to detect disease which leads to subjective diagnosis of sample and varies with level of expertise of examiner. The pathologist examine the tissue structure, distribution of cells in tissue, regularities of cell shapes and determine benign and malignancy in image. This is very time consuming and more prone to intra and inter observer variability. To overcome this difficulty a computer assisted image analysis is needed for quantitative diagnosis of tissue. In this paper we reviews and summarize the applications of digital image processing techniques for histology image analysis mainly to cover segmentation and disease classification methods.

KEYWORDS

Image processing, histopathological image analysis, image segmentation, and computer assisted diagnosis.

Volume URL : https://www.airccse.org/journal/sipij/vol3.html

Source URL : https://aircconline.com/sipij/V3N4/3412sipij03.pdf

REFERENCES

[1] Cigdem Demir And B'Ulent Yener, "Automated Cancer Diagnosis Based On Histopathological Images: A Systematic Survey", Technical Report, Rensselaer Polytechnic Institute, Department Of Computer Science, Tr-05-09. 1

[2] S. Waheed, R. A. Moffitt, Q. Chaudryl, A. N. Young, and M.D. Wang "Computer Aided Histopathological Classification of Cancer Subtypes", 1-4244-1509-8/07,2007 IEEE.

[3] Olcay Sertel, Umit V. Catalyurek, Hiroyuki Shimada, and Metin N. Gurcan, " Computer-aided Prognosis of Neuroblastoma: Detection of Mitosis and Karyorrhexis Cells in Digitized Histological Images",31st Annual International Conference of the IEEE EMBS Minneapolis, Minnesota, USA, September 2-6, 2009

[4] Ajay Basavanhallya, Elaine Yu, Jun Xu, Shridar Ganesan, Michael Feldman, John Tomaszewski, Anant Madabhushi, "Incorporating Domain Knowledge for Tubule Detection in Breast Histopathology Using O'Callaghan Neighborhoods", Medical Imaging 2011: Computer-Aided Diagnosis, Proc. of SPIE Vol. 7963, 796310, doi: 10.1117/12.878092

[5] Jun Xu, Andrew Janowczyk, Sharat Chandran, Anant Madabhushi, "A Weighted Mean Shift, Normalized Cuts Initialized Color Gradient Based Geodesic Active Contour Model: Applications to Histopathology Image Segmentation", Medical Imaging 2010: Image Processing, Proc. of SPIE Vol. 7623, 76230Y, doi: 10.1117/12.845602

[6] H. Fatakdawala, J. Xu, A. Basavanhally, G. Bhanot, S. Ganesan, M. Feldman, J. E. Tomaszewski, and A. Madabhushi, "Expectation maximization driven geodesic active contour with overlap resolution (emagacor): application to lymphocyte segmentation on breast cancer histopathology," Biomedical Engineering, IEEE Transactions on , In Press. 2009 Ninth IEEE International Conference on Bioinformatics and Bioengineering

[7] Jean-Romain Dalle, Wee Kheng Leow, Daniel Racoceanu, Adina Eunice Tutac, Thomas C. Putti, "Automatic Breast Cancer Grading of Histopathological Images", 30th Annual International IEEE EMBS Conference Vancouver, British Columbia, Canada, August 20-24, 2008

[8] Baochuan Pang, Yi Zhang, Qianqing Chen, Zhifan Gao, Qinmu Peng, Xinge You,"Cell Nucleus Segmentation in Color Histopathological Imagery Using Convolutional Networks", 978-1-4244- 7210-9/10, 2010 IEEE

[9] S. Naik, S. Doyle, S. Agner, A. Madabhushi, M. Feldman, and J. Tomaszewski, "Automated gland and nuclei segmentation for grading of prostate and breast cancer histopathology," in Biomedical Imaging: From Nano to Macro, 2008. ISBI 2008. 5th IEEE International Symposium on, pp. 284– 287, May 2008.

[10] Scott Doyle, Shannon Agner, Anant Madabhushi, Michael Feldman, John Tomaszewski, "Automated Grading Of Breast Cancer Histopathology Using Spectral Clustering with Textural and Architectural Image Features", 978-1-4244-2003-2/08, 2008 IEEE.

Feature Extraction Using MFCC

Shikha Gupta1, Jafreezal Jaafar1, Wan Fatimah Wan Ahmad1 and Arpit Bansal2

1Universiti Tecknologi PETRONAS, Malaysia and 2Indian Institute of Information and Technology, India

ABSTRACT

Mel Frequency Ceptral Coefficient is a very common and efficient technique for signal processing. This paper presents a new purpose of working with MFCC by using it for Hand gesture recognition. The objective of using MFCC for hand gesture recognition is to explore the utility of the MFCC for image processing. Till now it has been used in speech recognition, for speaker identification. The present system is based on converting the hand gesture into one dimensional (1-D) signal and then extracting first 13 MFCCs from the converted 1-D signal. Classification is performed by using Support Vector Machine. Experimental results represents that proposed application of using MFCC for gesture recognition have very good accuracy and hence can be used for recognition of sign language or for other household application with the combination for other techniques such as Gabor filter, DWT to increase the accuracy rate and to make it more efficient.

KEYWORDS

Hand gesture, 1D signal, MFCC (Mel Frequency Cepstral Coefficient), SVM (Support Vector Machine).

Volume URL : https://www.airccse.org/journal/sipij/vol4.html

Source URL : https://aircconline.com/sipij/V4N4/4413sipij08.pdf

REFERENCES

[1] A. Khan, et al., "Speech Recognition: Increasing Efficiency of Support Vector Machines," International Journal of Computer Applications vol. 35, dec 2011.

[2] A. S. Mehendale and M. R. Dixit, "SPEAKER IDENTIFICATION," Signal & Image Processing: An International Journal (SIPIJ), vol. 2, june 2011.

[3] L. Muda, et al., "Voice recognition algorithm Using Mel Frequency Cepstral Coefficient (MFCC) and Dynamic Time Warping (DTW) Techniques," Journal of computing vol. 2, 2010.

[4] A. Zulfiqar, et al., "A Speaker Identification System using MFCC Features with VQ Technique " Third International Symposium on Intelligent Informartion Technology Application, 2009.T. M. Talal and A. E.- . Sayad, "Identification of Satellite Images Based on Mel Frequency Cepstral Coefficients" 2009.

[5] D. C. Gope, "Hand Gesture Interaction with Human-Computer," Global Journal of Computer Science and Technology, vol. 11, dec 2011.

[6] T. Messer, "Static hand gesture recognition," University of Fribourg.

[7] S. K. Kang, et al., "Color Based Hand and Finger Detection Technology for user interaction," presented at the International Conference on Convergence and Hybrid Information Technology, 2008. [8] M. A. amin and H. Yan, "Sign Language Finger Alphabet Recognition from Gabor -PCA Representation of hand gestures," presented at the Proceeding of the sixth Internaional Conference on Machine Learning and Cybernetics, Hong Kong, 2007.

[9] Chen, et al., "Hand gesture recognition using Haar-like features and a stochastic context-free grammer," IEEE Transactions on Instrumentation and Measurement vol. 57, p. 9, 2008.

[10] D. C. Gope, "Hand Gesture Interaction with Human-Computer," Global Journal of Computer Science and Technology, vol. 11, dec 2011.

[11] D.-Y. Huang, et al., "Gabor filter-based hand-pose angle estimation for hand gesture recognition under varying illumination " Expert Systems With Applications, vol. 38, p. 12, 2011.

[12] S. Padam and K.Prabin.Bora, "A Study on Static Hand Gesture Recognition using Moments," presented at the International Conference on Signal Processing and Communications (SPCOM), 2010
[13] J. J. Stephan and S. a. Khudayer, "Gesture recognition for Human Computer Interaction" International Journal of Advancements in computing Technology, vol. 2, 4 November 2010.

[14] K. Symeonidis, "Hand Gesture Recognition Using Neural Networks," Centre for Vision, Speech and Signal ProcessingAugust 23, 2000.

[15] T. M. Talal and A. E.-. Sayad, "Identification of Satellite Images Based on Mel Frequency Cepstral Coefficients " 2009.

A Comparative Study of Histogram Equalization Based Image Enhancement Techniques for Brightness Preservation and Contrast Enhancement

Omprakash Patel, Yogendra P. S. Maravi and Sanjeev Sharma,

RGPV, India

ABSTRACT

Histogram Equalization is a contrast enhancement technique in the image processing which uses the histogram of image. However histogram equalization is not the best method for contrast enhancement because the mean brightness of the output image is significantly different from the input image. There are several extensions of histogram equalization has been proposed to overcome the brightness preservation challenge. Contrast enhancement using brightness preserving bi-histogram equalization (BBHE) and Dualistic sub image histogram equalization (DSIHE) which divides the image histogram into two parts based on the input mean and median respectively then equalizes each sub histogram independently. This paper provides review of different popular histogram equalization techniques and experimental study based on the absolute mean brightness error (AMBE), peak signal to noise ratio (PSNR), Structure similarity index (SSI) and Entropy.

KEYWORDS

Histogram Equalization, Contrast Enhancement, Brightness Preservation, Absolute Mean Brightness Error, Peak Signal to Noise Ratio, Structure Similarity Index.

Volume URL : https://www.airccse.org/journal/sipij/vol4.html

Source URL : https://aircconline.com/sipij/V4N5/4513sipij02.pdf

REFERENCES

[1] Wahab A, Chin SH, and Tan SH, “Novel Approach To Automated Fingerprint Recognition”, IEE Proceedings Vision, Image and Signal Processing, (1998), vol. 145, pp. 160-166.

[2] Pizer SM, “The Medical Image Display and Analysis Group at The University of North Carolina: Reminiscences and Philosophy”, IEEE Trans. Med. Image, (2003), vol. 22, pp. 2-10.

[3] Torre A, Peinado AM, Segura JC, Perez-Cordoba JL, Benitez MC, and Rubio AJ, “Histogram Equalization of Speech Representation for Robust Speech Recognition”, IEEE Trans. Speech Audio Processing, (2005), vol. 13, pp. 355-366.

[4] Scott E Umbaugh, Computer Vision and Image Processing, Prentice Hall: New Jersey 1998, pp. 209.
[5] Gonzalez RC and Woods RE, “Digital Image Processing” Pearson Education Pvt. Ltd, Second Edition, Delhi, (2003).

[6] Kim YT, “Contrast Enhancement Using Brightness Preserving Bi-Histogram Equalization”, Consumer Electronics, IEEE Transactions on, (1997), vol. 43, no.1, pp.1-8.

[7] Wang Y, Chen Q, and Zhang B, “Image Enhancement Based On Equal Area Dualistic Sub-Image Histogram Equalization Method”, Consumer Electronics, IEEE Transactions on, (1999), vol. 45, no. 1, pp. 68-75.

[8] Chen SD and Ramli A, “Contrast Enhancement Using Recursive Mean-Separate Histogram Equalization For Scalable Brightness Preservation”, Consumer Electronics, IEEE Transactions on, (2003), vol. 49, no. 4. pp. 1301-1309,

[9] Chen SD and Ramli A, “Minimum Mean Brightness Error Bi-Histogram Equalization in Contrast Enhancement”, Consumer Electronics, IEEE Transactions on, Nov (2003), vol. 49, no. 4, pp. 1310- 1319.

[10] Sim KS, Tso CP, and Tan YY, “Recursive Sub-Image Histogram Equalization Applied To Gray Scale Images”, Pattern Recognition Letters, Feb (2007), vol. 28, pp. 1209-1221.

AUTHORS

Omprakash Patel He was born in Jabalpur, India. He received his Bachelor of Engineering degree in Computer Science & Engineering from GGITS Jabalpur affiliated from RGPV Bhopal, in 2010. He is currently pursuing Master of Technology (M.Tech.) in Computer Science & Application from School of Information Technology, UTD, RGPV, Bhopal, India. His research interest includes image enhancement and medical image processing.

Yogendra P.S. Maravi He obtained his Bachelor's degree in Information Technology from UIT, RGPV, Bhopal. He received his M.Tech degree in Computer Science from School of Computer Science, DAVV, Indore. He is working as Assistant Professor in School of Information Technology, UTD, RGPV, Bhopal, India.

Dr. Sanjeev Sharma He is working as Associate Professor in the School of Information Technology, UTD, RGPV, Bhopal, India. His research interest is in Mobile Computing. He is a member of Computer Society of India ACM, Computer Science Teachers Association (CSTA).

Image Denoising Using New Adaptive Based Median Filter

Suman Shrestha

The University of Akron, USA

ABSTRACT

Noise is a major issue while transferring images through all kinds of electronic communication. One of the most common noise in electronic communication is an impulse noise which is caused by unstable voltage. In this paper, the comparison of known image denoising techniques is discussed and a new technique using the decision based approach has been used for the removal of impulse noise. All these methods can primarily preserve image details while suppressing impulsive noise. The principle of these techniques is at first introduced and then analysed with various simulation results using MATLAB. Most of the previously known techniques are applicable for the denoising of images corrupted with less noise density. Here a new decision based technique has been presented which shows better performances than those already being used. The comparisons are made based on visual appreciation and further quantitatively by Mean Square error (MSE) and Peak Signal to Noise Ratio (PSNR) of different filtered images.

KEYWORDS

Impulse Noise, Nonlinear filter, Adaptive Filters, Decision Based Filters.

Volume URL : https://www.airccse.org/journal/sipij/vol5.html

Source URL : https://aircconline.com/sipij/V5N4/5414sipij01.pdf

REFERENCES

[1] I. Pitas and A. N. Venetsanopoulos, “Nonlinear Digital Filters: Principles and Applications”, Boston, MA: Kluwer, 1990.

[2] J. Astola and P. Kuosmanen, “Fundamentals of Nonlinear Digital Filtering”, CRC Press, 1997.

[3] T. Sun, M. Gabbouj and Y. Neuvo, “Center weighted median filters: Some properties and their applications in image processing”, Signal Processing, vol. 35, Issue 3, pp 213-229, February 1994.

[4] T. Chen, K. K. Ma, L.H. Chen, “Tri-State Median Filter for Image Denoising”, IEEE Transactions on Image Processing, vol. 8, Issue 12, pp 1834-1838, 1999.

[5] Z. Wang, D. Zhang, “Progressive switching median filter for the removal of impulse noise from highly corrupted images”, IEEE Transactions on Circuits and Systems, vol. 46, Issue 1, pp 78-80, Jan 1999.

[6] V. V. Khryashchev, A. L. Priorov; I. V. Apalkov, P. S. Zvonarev, “Image denoising using adaptive switching median filter”, IEEE International Conference on Image Processing , vol. 1, pp 117-120, 2005.
[7] Y. Zhao, D. Li, Z. Li, “Performance enhancement and analysis of an adaptive median filter”, International Conference on Communications and Networking, pp. 651-653, 2007.

[8] V. Backman, R. Gurjar, K. Badizadegan, I. Itzkan, R. R. Dasari, L.T. Perelman and M.S. Feld, “A New Fast and Efficient Decision-Based Algorithm for Removal of High-Density Impulse Noises”, Signal Processing Letters, IEEE , Vol. 14, Issue 3, pp 189-192, 2007

[9] Z. Vasicek and L. Sekanina, “Novel Hardware Implementation of Adaptive Median Filters”, Design and Diagnostics of Electronic Circuits and Systems, IEEE, pp 1-6, April 2008.

[10] B. Caroline, G. Sheeba, J. Jeyarani, F. Salma Rosline Mary, “VLSI implementation and performance evaluation of adaptive filters for impulse noise removal”, Emerging Trends in Science, Engineering and Technology (INCOSET), 2012 International Conference on , vol., no., pp.294,299, 13-14 Dec. 2012.

Vehicle Detection and Tracking Techniques : A Concise Review

Raad Ahmed Hadi1,2, Ghazali Sulong1 and Loay Edwar George3,

1University Technology Malaysia, Malaysia,

2Iraqi University, Iraq and 3Baghdad University, Iraq

ABSTRACT

Vehicle detection and tracking applications play an important role for civilian and military applications such as in highway traffic surveillance control, management and urban traffic planning. Vehicle detection process on road are used for vehicle tracking, counts, average speed of each individual vehicle, traffic analysis and vehicle categorizing objectives and may be implemented under different environments changes. In this review, we present a concise overview of image processing methods and analysis tools which used in building these previous mentioned applications that involved developing traffic surveillance systems. More precisely and in contrast with other reviews, we classified the processing methods under three categories for more clarification to explain the traffic systems.

KEYWORDS

Vehicle detection, Tracking, Traffic surveillance, Occlusion, Shadow & Classification

Volume URL : https://www.airccse.org/journal/sipij/vol5.html

Source URL : https://aircconline.com/sipij/V5N1/5114sipij01.pdf

REFERENCES

[1] H. Chung-Lin and L. Wen-Chieh, "A vision-based vehicle identification system," in Pattern Recognition, 2004. ICPR 2004. Proceedings of the 17th International Conference on, 2004, pp. 364- 367 Vol.4.

[2] Z. Wei, et al., "Multilevel Framework to Detect and Handle Vehicle Occlusion," Intelligent Transportation Systems, IEEE Transactions on, vol. 9, pp. 161-174, 2008.

[3] N. K. Kanhere and S. T. Birchfield, "Real-Time Incremental Segmentation and Tracking of Vehicles at Low Camera Angles Using Stable Features," Intelligent Transportation Systems, IEEE Transactions on, vol. 9, pp. 148-160, 2008.

[4] N. K. Kanhere, "Vision-based detection, tracking and classification of vehicles using stable features with automatic camera calibration," ed, 2008, p. 105.

[5] A. H. S. Lai, et al., "Vehicle type classification from visual-based dimension estimation," in Intelligent Transportation Systems, 2001. Proceedings. 2001 IEEE, 2001, pp. 201-206.

[6] Z. Zhigang, et al., "A real-time vision system for automatic traffic monitoring based on 2D spatiotemporal images," in Applications of Computer Vision, 1996. WACV '96., Proceedings 3rd IEEE Workshop on, 1996, pp. 162-167.

[7] W. Wei, et al., "A method of vehicle classification using models and neural networks," in Vehicular Technology Conference, 2001. VTC 2001 Spring. IEEE VTS 53rd, 2001, pp. 3022-3026 vol.4.

[8] R. Rad and M. Jamzad, "Real time classification and tracking of multiple vehicles in highways," Pattern Recognition Letters, vol. 26, pp. 1597-1607, 2005.

[9] Y. Iwasaki and H. Itoyama, "Real-time Vehicle Detection Using Information of Shadows Underneath Vehicles," in Advances in Computer, Information, and Systems Sciences, and Engineering, K. Elleithy, et al., Eds., ed: Springer Netherlands, 2006, pp. 94-98.

[10] K. H. Lim, et al., "Lane-Vehicle Detection and Tracking," Proceedings of the International MultiConference of Engineers and Computer Scientists (IMECS 2009), vol. 2, pp. 5–10, 2009.

AUTHORS

Raad Ahmed Hadi was born in June 1, 1979, Baghdad, Iraq. He received his M.Sc. Computer Science 2006 Iraqi Commission for Computers and Informatics, Baghdad, Iraq, B.Sc. Computer Science 2003 University of Technology, Baghdad, Iraq. Currently he is PhD. student in University Technology Malaysia (UTM), Johor, Malaysia.

Ghazali Sulong was born in May 21, 1958 Malaysia. He received his Ph.D. Computing 1989 University of Wales College of Cardiff (UWCC), Wales, U.K., M.Sc. Computing 1982 University of Wales College Cardiff (UCC), Wales, U.K., B.Sc. Statistic 1979 UKM, Malaysia. Currently he is a Professor in Image Processing.

Loay Edwar George was born in July 1, 1957 Baghdad, Iraq. He received his Ph.D. Computer Science 1997 Baghdad University, Baghdad, Iraq, M.Sc. Physics 1983 Baghdad University, Baghdad, Iraq, B.Sc. Physics 1979 Baghdad University, Baghdad, Iraq. Currently he is a Professor in Image Processing.

Red Blood Cells Estimation Using Hough Transform Technique

Nasrul Humaimi Mahmood and Muhammad Asraf Mansor

Universiti Teknologi Malaysia, Malaysia

ABSTRACT

The number of red blood cells contributes more to clinical diagnosis with respect to blood diseases. The aim of this research is to produce a computer vision system that can detect and estimate the number of red blood cells in the blood sample image. Morphological is a very powerful tool in image processing, and it is been used to segment and extract the red blood cells from the background and other cells. The algorithm used features such as shape of red blood cells for counting process, and Hough transform is introduced in this process. The result presented here is based on images with normal blood cells. The tested data consists of 10 samples and produced the accurate estimation rate closest to 96% from manual counting.

KEYWORDS

Red blood cells, MATLAB, Hough Transform, Morphological Image Processing.

Volume URL : https://www.airccse.org/journal/sipij/vol3.html

Source URL : https://aircconline.com/sipij/V3N2/3212sipij04.pdf

REFERENCES

[1] Michael R. Pinsky, Laurent Brochard and Jordi Mancebo. “Applied Physiology in Intensive Care Medicine”. Springer. 229-238, 2007.

[2] Dondorp AM, Angus BJ, Chotivanich K, Silamut K, Ruangveerayuth R, Hardeman MR, Kager PA, Vreeken J,White NJ. “Red cell deformability as a predictor of anemia in severe falciparum malaria”. Am J Trop Med Hyg 60: 733–744; 1999.

[3] Medicine Health – http://www.medicinehealth.com/leukemia/article.html.

[4] Yuzhang WEI. “The Research of Urinary Sediment Visual Component Analysis Based on Fuzzy Clustering”. Nanjing Information Engineering University, 2008:3-4,15-32.

[5] Ran Ding. “Algorithm Research on Recognition and Classification of Microscopic Urinary Sediment Images”. Jilin University, 2006: 9-16, 20-31.

[6] C.D. Ruberto, A.G. Dempster, S. Khan and B. Jarra. “Segmentation of Blood Image using Morphological Operators”. Proceeding 15th International Conference on Pattern Recognition. vol. 3, pp. 397-400, 2000.

[7] Tahir Rabbani and Frank van den Heuvel, "Efficient hough transform for automatic detection of cylinders in point clouds" in Proceedings of the 11th Annual Conference of the Advanced School for Computing and Imaging (ASCI '05), The Netherlands, June 2005.

[8] Roy A. Dimayuga, Gerwin T. Ong, Rainier Carlo S. Perez, Gefferson O. Siy, Saman C. Sohrabi Langroudi and Miguel O.Gutierrez. “Leukemia Detection Using Digital Image Processing in Matlab”. ECE Student Forum, De La Salle University, Manila. March 26, 2010.

[9] Ramin Soltanzadeh. “Classification of Three Types of Red Blood Cells in Peripheral Blood Smear Based on Morphology. Proceedings of ICSP, 2010.

[10] Heidi Berge, Dale Taylor, Sriram Krishnan, and Tania S. Douglas. Improved Red Blood Cell Counting in thin Blood Smears. Proceedings of ISBI, 2011. pp.204-207.

AUTHORS:

N. H. MAHMOOD received his B.Eng. and M.Eng. degrees in Electrical Engineering from Universiti Kebangsaan Malaysia (UKM) and Universiti Teknologi Malaysia (UTM) respectively. He obtained his Ph.D. degree from the University of Warwick, United Kingdom. His research areas are biomedical image processing, medical electronics and rehabilitation engineering. Currently he is a Senior Lecturer at Faculty of Health Science and Biomedical Engineering, UTM.

M. A. MANSOR received his B. Eng and M. Eng. in Electrical Engineering from Universiti Teknologi Malaysia (UTM). His research areas are biomedical signal processing and medical electronics. He is now serving as a tutor at the Faculty of Health Science and Biomedical Engineering, UTM for past 3 years.