

Bibliography

- [1] Cook, M. P. Visual representations in science education: The influence of prior knowledge and cognitive load theory on instructional design principles. *Science education*, 90(6):1073–1091, 2006.
- [2] Lamdan, Y., Schwartz, J. T., and Wolfson, H. J. Affine invariant model-based object recognition. *IEEE transactions on robotics and automation*, 6(5):578–589, 1990.
- [3] Gold, S., Rangarajan, A., Lu, C.-P., Pappu, S., and Mjolsness, E. New algorithms for 2d and 3d point matching: pose estimation and correspondence. *Pattern recognition*, 31(8):1019–1031, 1998.
- [4] Mäenpää, T., Ojala, T., Pietikäinen, M., and Soriano, M. Robust texture classification by subsets of local binary patterns. In *15th International Conference on Pattern Recognition. ICPR-2000*, volume 3, pages 935–938. IEEE, 2000.
- [5] Jones, B., Schaefer, G., and Zhu, S. Content-based image retrieval for medical infrared images. In *The 26th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, volume 1, pages 1186–1187. IEEE, 2004.
- [6] Ballesteros, J., Travieso, C., Alonso, J., and Ferrer, M. Slant estimation of handwritten characters by means of zernike moments. *Electronics Letters*, 41(20):1110–1112, 2005.
- [7] Andreopoulos, A. and Tsotsos, J. K. Efficient and generalizable statistical models of shape and appearance for analysis of cardiac mri. *Medical Image Analysis*, 12(3):335–357, 2008.
- [8] Li, S., Lee, M.-C., and Pun, C.-M. Complex zernike moments features for shape-based image retrieval. *IEEE Transactions on Systems, Man, and Cybernetics-Part A: Systems and Humans*, (1), 2008.

- [9] Vipparthi, S. K., Murala, S., Gonde, A. B., and Jonathan Wu, Q. Local directional mask maximum edge patterns for image retrieval and face recognition. *IET Computer Vision*, 10(3):182–192, 2016.
- [10] Scott, G. J., Klaric, M. N., Davis, C. H., and Shyu, C.-R. Entropy-balanced bitmap tree for shape-based object retrieval from large-scale satellite imagery databases. *IEEE Transactions on Geoscience and Remote Sensing*, 49(5):1603–1616, 2010.
- [11] Thies, B. and Bendix, J. Satellite based remote sensing of weather and climate: recent achievements and future perspectives. *Meteorological Applications*, 18(3):262–295, 2011.
- [12] Li, Y., Tao, C., Tan, Y., Shang, K., and Tian, J. Unsupervised multilayer feature learning for satellite image scene classification. *IEEE Geoscience and Remote Sensing Letters*, 13(2):157–161, 2016.
- [13] Silva, C. A., Guerrisi, G., Del Frate, F., and Sano, E. E. Near-real time deforestation detection in the brazilian amazon with sentinel-1 and neural networks. *European Journal of Remote Sensing*, 55(1):129–149, 2022.
- [14] Tahmasbi, A., Saki, F., and Shokouhi, S. B. Classification of benign and malignant masses based on zernike moments. *Computers in biology and medicine*, 41(8):726–735, 2011.
- [15] Chowdhury, M. *On Content Based Image Retrieval and Its Application*. PhD thesis, 2015.
- [16] Arachchilage, I. P. R. et al. *Building an Efficient Content Based Image Retrieval System by Changing the Database Structure*. PhD thesis, 2016.
- [17] Jenni, K. *Content Based Image Retrieval By Preprocessing Image Database*. PhD thesis, Indian Institute of Technology Hyderabad, 2011.
- [18] Gudivada, V. N. and Raghavan, V. V. Content based image retrieval systems. *Computer*, 28(9):18–22, 1995.
- [19] Lew, M. S., Sebe, N., Djeraba, C., and Jain, R. Content-based multimedia information retrieval: State of the art and challenges. *ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)*, 2(1):1–19, 2006.
- [20] Müller, H., Michoux, N., Bandon, D., and Geissbuhler, A. A review of content-based image retrieval systems in medical applicationsclinical benefits

- and future directions. *International journal of medical informatics*, 73(1):1–23, 2004.
- [21] Veltkamp, R. C. and Tanase, M. A survey of content-based image retrieval systems. In *Content-based image and video retrieval*, pages 47–101. Springer, 2002.
- [22] Vogel, J. and Schiele, B. Semantic modeling of natural scenes for content-based image retrieval. *International Journal of Computer Vision*, 72(2):133–157, 2007.
- [23] Ahmed, K. T., Ummesafi, S., and Iqbal, A. Content based image retrieval using image features information fusion. *Information Fusion*, 51:76–99, 2019.
- [24] Sucharitha, G. and Senapati, R. K. Shape based image retrieval using lower order zernike moments. *International Journal of Electrical and Computer Engineering*, 7(3):1651, 2017.
- [25] Kumar, Y., Aggarwal, A., Tiwari, S., and Singh, K. An efficient and robust approach for biomedical image retrieval using zernike moments. *Biomedical Signal Processing and Control*, 39:459–473, 2018.
- [26] Persoon, E. and Fu, K.-S. Shape discrimination using fourier descriptors. *IEEE Transactions on systems, man, and cybernetics*, 7(3):170–179, 1977.
- [27] Tang, Y. Y. and Suen, C. Y. Extraction of peripheral shape features in chinese character recognition. In *Proceedings of the 12th IAPR International Conference on Pattern Recognition, Vol. 3-Conference C: Signal Processing (Cat. No. 94CH3440-5)*, volume 2, pages 377–379. IEEE, 1994.
- [28] Zahn, C. T. and Roskies, R. Z. Fourier descriptors for plane closed curves. *IEEE Transactions on computers*, 100(3):269–281, 1972.
- [29] Mokhtarian, F. and Mackworth, A. K. A theory of multiscale, curvature-based shape representation for planar curves. *IEEE transactions on pattern analysis and machine intelligence*, 14(8):789–805, 1992.
- [30] Chen, Y., Zhang, M., Lu, P., and Wang, Y. Local moment invariant analysis. In *International Conference on Computer Graphics, Imaging and Visualization (CGIV'05)*, pages 137–140. IEEE, 2005.
- [31] Hu, M.-K. Visual pattern recognition by moment invariants. *IRE transactions on information theory*, 8(2):179–187, 1962.

- [32] Teague, M. R. Image analysis via the general theory of moments. *Josa*, 70(8):920–930, 1980.
- [33] Teh, C.-H. and Chin, R. T. On image analysis by the methods of moments. *IEEE Transactions on pattern analysis and machine intelligence*, 10(4):496–513, 1988.
- [34] Terrillon, J.-C., David, M., and Akamatsu, S. Automatic detection of human faces in natural scene images by use of a skin color model and of invariant moments. In *Proceedings Third IEEE International Conference on Automatic Face and Gesture Recognition*, pages 112–117. IEEE, 1998.
- [35] Al-Insaf, S. *Shearlet-based Descriptors and Deep Learning Approaches for Medical Image Classification*. PhD thesis, Université d’Ottawa/University of Ottawa, 2021.
- [36] Humeau-Heurtier, A. Texture feature extraction methods: A survey. *IEEE access*, 7:8975–9000, 2019.
- [37] Haralick, R. M., Shanmugam, K., and Dinstein, I. H. Textural features for image classification. *IEEE Transactions on systems, man, and cybernetics*, (6):610–621, 1973.
- [38] Connors, R. W. and Harlow, C. A. A theoretical comparison of texture algorithms. *IEEE transactions on pattern analysis and machine intelligence*, (3):204–222, 1980.
- [39] Galloway, M. M. Texture analysis using gray level run lengths. *Computer graphics and image processing*, 4(2):172–179, 1975.
- [40] Rosenfeld, A. and Troy, E. B. Visual texture analysis. Technical report, Maryland Univ., College Park (USA). Computer Science Center, 1970.
- [41] Sharma, M. and Ghosh, H. Histogram of gradient magnitudes: a rotation invariant texture-descriptor. In *2015 IEEE International Conference on Image Processing (ICIP)*, pages 4614–4618. IEEE, 2015.
- [42] Vieira, R. T., Oliveira Chierici, C. E. d., Ferraz, C. T., and Gonzaga, A. Local fuzzy pattern: A new way for micro-pattern analysis. In *International Conference on Intelligent Data Engineering and Automated Learning*, pages 602–611. Springer, 2012.
- [43] Zhang, J., Liang, J., and Zhao, H. Local energy pattern for texture classification using self-adaptive quantization thresholds. *IEEE transactions on image processing*, 22(1):31–42, 2012.

- [44] Matheron, G. Principles of geostatistics. *Economic geology*, 58(8):1246–1266, 1963.
- [45] Tamura, H., Mori, S., and Yamawaki, T. Textural features corresponding to visual perception. *IEEE Transactions on Systems, man, and cybernetics*, 8(6):460–473, 1978.
- [46] Ojala, T., Pietikäinen, M., and Harwood, D. A comparative study of texture measures with classification based on featured distributions. *Pattern recognition*, 29(1):51–59, 1996.
- [47] Wang, K., Bichot, C.-E., Zhu, C., and Li, B. Pixel to patch sampling structure and local neighboring intensity relationship patterns for texture classification. *IEEE Signal Processing Letters*, 20(9):853–856, 2013.
- [48] Cai, L., Wang, X., Wang, Y., Guo, Y., Yu, J., and Wang, Y. Robust phase-based texture descriptor for classification of breast ultrasound images. *Biomedical engineering online*, 14(1):1–21, 2015.
- [49] Zhang, Z., Liu, S., Mei, X., Xiao, B., and Zheng, L. Learning completed discriminative local features for texture classification. *Pattern Recognition*, 67:263–275, 2017.
- [50] Liu, L., Fieguth, P., Guo, Y., Wang, X., and Pietikäinen, M. Local binary features for texture classification: Taxonomy and experimental study. *Pattern Recognition*, 62:135–160, 2017.
- [51] Larsen, A. B. L., Vestergaard, J. S., and Larsen, R. Hep-2 cell classification using shape index histograms with donut-shaped spatial pooling. *IEEE transactions on medical imaging*, 33(7):1573–1580, 2014.
- [52] Chen, J., Shan, S., He, C., Zhao, G., Pietikäinen, M., Chen, X., and Gao, W. Wld: A robust local image descriptor. *IEEE transactions on pattern analysis and machine intelligence*, 32(9):1705–1720, 2009.
- [53] Ullah, I., Hussain, M., Muhammad, G., Aboalsamh, H., Bebis, G., and Mirza, A. M. Gender recognition from face images with local wld descriptor. In *2012 19th international conference on systems, signals and image processing (IWSSIP)*, pages 417–420. IEEE, 2012.
- [54] Voorhees, H. and Poggio, T. Detecting textons and texture boundaries in natural images. In *Proceedings of the First International Conference on Computer Vision*, volume 59, pages 250–258, 1987.

- [55] Song, T., Li, H., Meng, F., Wu, Q., and Cai, J. Letrist: Locally encoded transform feature histogram for rotation-invariant texture classification. *IEEE Transactions on circuits and systems for video technology*, 28(7):1565–1579, 2017.
- [56] Li, W., Zhang, D., and Xu, Z. Palmprint identification by fourier transform. *International Journal of Pattern Recognition and Artificial Intelligence*, 16(04):417–432, 2002.
- [57] Chalumeau, T., Costa, L. d. F., Laligant, O., and Meriaudeau, F. Complex networks: application for texture characterization and classification. *Elcvia: Electronic letters on computer vision and image analysis*, 7(3):93–100, 2008.
- [58] Ahuja, N. and Rosenfeld, A. Mosaic models for textures. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, (1):1–11, 1981.
- [59] Kashyap, R. L. and Khotanzad, A. A model-based method for rotation invariant texture classification. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, (4):472–481, 1986.
- [60] Vaishali, D., Ramesh, R., and Christaline, J. 2d causal arma model for texture analysis synthesis and classification. *Int. J. Appl. Eng. Res.*, 9(22):16317–16328, 2014.
- [61] Kashyap, R. L., Chellappa, R., and Khotanzad, A. Texture classification using features derived from random field models. *Pattern Recognition Letters*, 1(1):43–50, 1982.
- [62] Bennett, J. and Khotanzad, A. Modeling textured images using generalized long correlation models. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 20(12):1365–1370, 1998.
- [63] Pentland, A. P. Fractal-based description of natural scenes. *IEEE transactions on pattern analysis and machine intelligence*, (6):661–674, 1984.
- [64] Junior, J. J. d. M. S. and Backes, A. R. A simplified gravitational model to analyze texture roughness. *Pattern Recognition*, 45(2):732–741, 2012.
- [65] Liu, F. and Picard, R. W. Periodicity, directionality, and randomness: Wold features for image modeling and retrieval. *IEEE transactions on pattern analysis and machine intelligence*, 18(7):722–733, 1996.
- [66] Backes, A. R., Martinez, A. S., and Bruno, O. M. Texture analysis using graphs generated by deterministic partially self-avoiding walks. *Pattern Recognition*, 44(8):1684–1689, 2011.

- [67] Junior, J. J. d. M. S., Backes, A. R., and Cortez, P. C. Texture analysis and classification using shortest paths in graphs. *Pattern Recognition Letters*, 34(11):1314–1319, 2013.
- [68] Cimpoi, M., Maji, S., and Vedaldi, A. Deep filter banks for texture recognition and segmentation. In *Proceedings of the IEEE conference on computer vision and pattern recognition*, pages 3828–3836, 2015.
- [69] Junior, J. J. d. M. S. and Backes, A. R. Elm based signature for texture classification. *Pattern Recognition*, 51:395–401, 2016.
- [70] Leung, T. and Malik, J. Representing and recognizing the visual appearance of materials using three-dimensional textons. *International journal of computer vision*, 43(1):29–44, 2001.
- [71] Humeau-Heurtier, A. The multiscale entropy algorithm and its variants: A review. *Entropy*, 17(5):3110–3123, 2015.
- [72] Silva, L. E. V., Senra Filho, A., Fazan, V. P. S., Felipe, J. C., and Junior, L. M. Two-dimensional sample entropy: Assessing image texture through irregularity. *Biomedical Physics & Engineering Express*, 2(4):045002, 2016.
- [73] Azami, H., Escudero, J., and Humeau-Heurtier, A. Bidimensional distribution entropy to analyze the irregularity of small-sized textures. *IEEE Signal Processing Letters*, 24(9):1338–1342, 2017.
- [74] N, D. M. and Vetterli, M. Contourlets: a directional multiresolution image representation. In *International Conference on Image Processing*, volume 1, 2002.
- [75] Cands, E. J. and Donoho, D. L. Curvelets: A surprisingly effective non-adaptive representation for objects with edges. Technical report, Stanford University, Dept of Statistics, 2000.
- [76] Easley, G., Labate, D., and Lim, W.-Q. Sparse directional image representations using the discrete shearlet transform. *Applied and Computational Harmonic Analysis*, 25(1):25–46, 2008.
- [77] Pfeifer, L. *Pedestrian Detection Algorithms Using Shearlets*. Logos Verlag Berlin GmbH, 2019.
- [78] Sadreazami, H. *Contourlet Domain Image Modeling and its Applications in Watermarking and Denoising*. PhD thesis, Concordia University, 2016.

- [79] Liu, Z. and Zhu, L. A novel retrieval method for remote sensing image based on statistical model. *Multimedia Tools and Applications*, 77(19):24643–24662, 2018.
- [80] Buccigrossi, R. W. and Simoncelli, E. P. Image compression via joint statistical characterization in the wavelet domain. *IEEE Transactions on Image Processing*, 8(12):1688–1701, 1999.
- [81] Dubey, S. R., Singh, S. K., and Singh, R. K. Local bit-plane decoded pattern: a novel feature descriptor for biomedical image retrieval. *IEEE Journal of Biomedical and Health Informatics*, 20(4):1139–1147, 2015.
- [82] Dubey, S. R., Singh, S. K., and Singh, R. K. Novel local bit-plane dissimilarity pattern for computed tomography image retrieval. *Electronics Letters*, 52(15):1290–1292, 2016.
- [83] Hatibaruah, R., Nath, V. K., and Hazarika, D. Computed tomography image retrieval via combination of two local bit plane-based dissimilarities using an adder. *International Journal of Wavelets, Multiresolution and Information Processing*, 19(1):1–18, 2020.
- [84] Hatibaruah, R., Nath, V. K., and Hazarika, D. Local bit plane adjacent neighborhood dissimilarity pattern for medical ct image retrieval. *Procedia Computer Science*, 165:83–89, 2019.
- [85] Sucharitha, G. and Senapati, R. K. Biomedical image retrieval by using local directional edge binary patterns and zernike moments. *Multimedia Tools and Applications*, 79(3):1847–1864, 2020.
- [86] Das, P. and Neelima, A. A robust feature descriptor for biomedical image retrieval. *IRBM*, 42(4):245–257, 2021.
- [87] Liu, L., Chen, J., Fieguth, P., Zhao, G., Chellappa, R., and Pietikäinen, M. From bow to cnn: Two decades of texture representation for texture classification. *International Journal of Computer Vision*, 127(1):74–109, 2019.
- [88] Haralick, R. M. Statistical and structural approaches to texture. *Proceedings of the IEEE*, 67(5):786–804, 1979.
- [89] Laws, K. I. Rapid texture identification. In *Image processing for missile guidance*, volume 238, pages 376–381. SPIE, 1980.
- [90] Bovik, A. C., Clark, M., and Geisler, W. S. Multichannel texture analysis using localized spatial filters. *IEEE transactions on pattern analysis and machine intelligence*, 12(1):55–73, 1990.

- [91] Jain, A. K. and Farrokhnia, F. Unsupervised texture segmentation using gabor filters. *Pattern recognition*, 24(12):1167–1186, 1991.
- [92] Manjunath, B. S. and Ma, W.-Y. Texture features for browsing and retrieval of image data. *IEEE Transactions on pattern analysis and machine intelligence*, 18(8):837–842, 1996.
- [93] Malik, J. and Perona, P. Preattentive texture discrimination with early vision mechanisms. *JOSA A*, 7(5):923–932, 1990.
- [94] Cross, G. R. and Jain, A. K. Markov random field texture models. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, (1):25–39, 1983.
- [95] Mao, J. and Jain, A. K. Texture classification and segmentation using multiresolution simultaneous autoregressive models. *Pattern recognition*, 25(2):173–188, 1992.
- [96] Chellappa, R. and Chatterjee, S. Classification of textures using gaussian markov random fields. *IEEE Transactions on Acoustics, Speech, and Signal Processing*, 33(4):959–963, 1985.
- [97] G, L. D. Distinctive image features from scale-invariant keypoints. *International journal of computer vision*, 60(2):91–110, 2004.
- [98] Ojala, T., Pietikainen, M., and Maenpaa, T. Multiresolution gray-scale and rotation invariant texture classification with local binary patterns. *IEEE Transactions on pattern analysis and machine intelligence*, 24(7):971–987, 2002.
- [99] Pietikäinen, M., Ojala, T., and Xu, Z. Rotation-invariant texture classification using feature distributions. *Pattern recognition*, 33(1):43–52, 2000.
- [100] Heikkilä, M., Pietikäinen, M., and Schmid, C. Description of interest regions with center-symmetric local binary patterns. In *Computer vision, graphics and image processing*, pages 58–69. Springer, 2006.
- [101] Zhao, G. and Pietikainen, M. Dynamic texture recognition using local binary patterns with an application to facial expressions. *IEEE transactions on pattern analysis and machine intelligence*, 29(6):915–928, 2007.
- [102] Nanni, L., Lumini, A., and Brahnma, S. Local binary patterns variants as texture descriptors for medical image analysis. *Artificial intelligence in medicine*, 49(2):117–125, 2010.

- [103] Guo, Z., Zhang, L., and Zhang, D. A completed modeling of local binary pattern operator for texture classification. *IEEE transactions on image processing*, 19(6):1657–1663, 2010.
- [104] Chen, C., Zhang, B., Su, H., Li, W., and Wang, L. Land-use scene classification using multi-scale completed local binary patterns. *Signal, image and video processing*, 10(4):745–752, 2016.
- [105] Tan, X. and Triggs, B. Enhanced local texture feature sets for face recognition under difficult lighting conditions. *IEEE transactions on image processing*, 19(6):1635–1650, 2010.
- [106] Murala, S., Maheshwari, R., and Balasubramanian, R. Local tetra patterns: a new feature descriptor for content-based image retrieval. *IEEE transactions on image processing*, 21(5):2874–2886, 2012.
- [107] Nguyen, H.-T. and Caplier, A. Elliptical local binary patterns for face recognition. In *Asian conference on computer vision*, pages 85–96. Springer, 2012.
- [108] Murala, S. and Wu, Q. J. Local ternary co-occurrence patterns: a new feature descriptor for mri and ct image retrieval. *Neurocomputing*, 119:399–412, 2013.
- [109] Murala, S. and Wu, Q. J. Mri and ct image indexing and retrieval using local mesh peak valley edge patterns. *Signal processing: image communication*, 29(3):400–409, 2014.
- [110] Rivera, A. R., Castillo, J. R., and Chae, O. O. Local directional number pattern for face analysis: Face and expression recognition. *IEEE transactions on image processing*, 22(5):1740–1752, 2012.
- [111] Murala, S. and Wu, Q. J. Local ternary co-occurrence patterns: a new feature descriptor for mri and ct image retrieval. *Neurocomputing*, 119:399–412, 2013.
- [112] Sheng, G., Yang, W., Xu, T., and Sun, H. High-resolution satellite scene classification using a sparse coding based multiple feature combination. *International journal of remote sensing*, 33(8):2395–2412, 2012.
- [113] Qi, X., Xiao, R., Li, C.-G., Qiao, Y., Guo, J., and Tang, X. Pairwise rotation invariant co-occurrence local binary pattern. *IEEE transactions on pattern analysis and machine intelligence*, 36(11):2199–2213, 2014.

- [114] Verma, M. and Balasubramanian, R. P. Center symmetric local binary co-occurrence pattern for texture, face and bio-medical image retrieval. *Journal of Visual Communication and Image Representation*, 32:224–236, 2015.
- [115] Dubey, S. R., Singh, S. K., and Singh, R. K. Boosting local binary pattern with bag-of-filters for content based image retrieval. In *2015 IEEE UP Section Conference on Electrical Computer and Electronics (UPCON)*, pages 1–6. IEEE, 2015.
- [116] Dubey, S. R., Singh, S. K., and Singh, R. K. Local diagonal extrema pattern: a new and efficient feature descriptor for ct image retrieval. *IEEE Signal Processing Letters*, 22(9):1215–1219, 2015.
- [117] Verma, M. and Raman, B. Local tri-directional patterns: A new texture feature descriptor for image retrieval. *Digital Signal Processing*, 51:62–72, 2016.
- [118] Murala, S. and Wu, Q. J. Spherical symmetric 3d local ternary patterns for natural, texture and biomedical image indexing and retrieval. *Neurocomputing*, 149:1502–1514, 2015.
- [119] Agarwal, M., Singhal, A., and Lall, B. 3d local ternary co-occurrence patterns for natural, texture, face and bio medical image retrieval. *Neurocomputing*, 313:333–345, 2018.
- [120] Aptoula, E. Remote sensing image retrieval with global morphological texture descriptors. *IEEE transactions on geoscience and remote sensing*, 52(5):3023–3034, 2013.
- [121] Bosilj, P., Aptoula, E., Lefèvre, S., and Kijak, E. Retrieval of remote sensing images with pattern spectra descriptors. *ISPRS International Journal of Geo-Information*, 5(12):228, 2016.
- [122] Dubey, S. R., Singh, S. K., and Singh, R. K. Multichannel decoded local binary patterns for content-based image retrieval. *IEEE transactions on image processing*, 25(9):4018–4032, 2016.
- [123] Bian, X., Chen, C., Du, Q., and Sheng, Y. Extended multi-structure local binary pattern for high-resolution image scene classification. In *2016 Ieee International Geoscience and Remote Sensing Symposium (Igarss)*, pages 5134–5137. IEEE, 2016.
- [124] Dubey, S. R. Face retrieval using frequency decoded local descriptor. *Multimedia Tools and Applications*, 78(12):16411–16431, 2019.

- [125] Banerjee, P., Bhunia, A. K., Bhattacharyya, A., Roy, P. P., and Murala, S. Local neighborhood intensity pattern: A new texture feature descriptor for image retrieval. *Expert Systems with Applications*, 113:100–115, 2018.
- [126] Ghose, S., Das, A., Bhunia, A. K., and Roy, P. P. Fractional local neighborhood intensity pattern for image retrieval using genetic algorithm. *Multimedia Tools and Applications*, 79(25):18527–18552, 2020.
- [127] Roy, S. K., Chanda, B., Chaudhuri, B. B., Banerjee, S., Ghosh, D. K., and Dubey, S. R. Local directional zigzag pattern: A rotation invariant descriptor for texture classification. *Pattern Recognition Letters*, 108:23–30, 2018.
- [128] Dubey, S. R. Local directional relation pattern for unconstrained and robust face retrieval. *Multimedia tools and applications*, 78:28063–28088, 2019.
- [129] Liu, L., Lao, S., Fieguth, P. W., Guo, Y., Wang, X., and Pietikäinen, M. Median robust extended local binary pattern for texture classification. *IEEE Transactions on Image Processing*, 25(3):1368–1381, 2016.
- [130] Tekeste, I. and Demir, B. Advanced local binary patterns for remote sensing image retrieval. In *IGARSS 2018-2018 IEEE International Geoscience and Remote Sensing Symposium*, pages 6855–6858. IEEE, 2018.
- [131] Chakraborty, S., Singh, S. K., and Chakraborty, P. Local gradient hexa pattern: A descriptor for face recognition and retrieval. *IEEE transactions on circuits and systems for video technology*, 28(1):171–180, 2016.
- [132] Vipparthi, S. K. and Nagar, S. K. Color directional local quinary patterns for content based indexing and retrieval. *Human-centric Computing and Information Sciences*, 4(1):1–13, 2014.
- [133] Sukhia, K. N., Riaz, M. M., Ghafoor, A., and Ali, S. S. Content-based remote sensing image retrieval using multi-scale local ternary pattern. *Digital Signal Processing*, 104:102765, 2020.
- [134] Oliva, A. and Torralba, A. Modeling the shape of the scene: A holistic representation of the spatial envelope. *International journal of computer vision*, 42(3):145–175, 2001.
- [135] Swain, M. J. and Ballard, D. H. Color indexing. *International journal of computer vision*, 7(1):11–32, 1991.

- [136] Ferecatu, M. and Boujemaa, N. Interactive remote-sensing image retrieval using active relevance feedback. *IEEE Transactions on Geoscience and Remote Sensing*, 45(4):818–826, 2007.
- [137] Ma, A. and Sethi, I. K. Local shape association based retrieval of infrared satellite images. *7th IEEE International Symposium on Multimedia (ISM'05)*, pages 551–557, Irvine, CA, USA, December 2005.
- [138] Fu-ping, Y. and Mei-li, H. Effective image retrieval using texture elements and color fuzzy correlogram. *Information*, 8(1):1–11, 2017.
- [139] Aggarwal, A., Sharma, S., Singh, K., Singh, H., and Kumar, S. A new approach for effective retrieval and indexing of medical images. *Biomedical Signal Processing and Control*, 50:10–34, 2019.
- [140] Risojević, V. and Babić, Z. Fusion of global and local descriptors for remote sensing image classification. *IEEE Geoscience and Remote Sensing Letters*, 10(4):836–840, 2012.
- [141] Bian, X., Chen, C., Tian, L., and Du, Q. Fusing local and global features for high-resolution scene classification. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 10(6):2889–2901, 2017.
- [142] Zeng, D., Chen, S., Chen, B., and Li, S. Improving remote sensing scene classification by integrating global-context and local-object features. *Remote Sensing*, 10(5):734, 2018.
- [143] Van de Wouwer, G., Scheunders, P., and Van Dyck, D. Statistical texture characterization from discrete wavelet representations. *IEEE transactions on image processing*, 8(4):592–598, 1999.
- [144] Do, M. N. and Vetterli, M. Wavelet-based texture retrieval using generalized gaussian density and kullback-leibler distance. *IEEE transactions on image processing*, 11(2):146–158, 2002.
- [145] Kokare, M., Biswas, P. K., and Chatterji, B. N. Texture image retrieval using new rotated complex wavelet filters. *IEEE Transactions on Systems, Man, and Cybernetics, Part B (Cybernetics)*, 35(6):1168–1178, 2005.
- [146] Selvan, S. and Ramakrishnan, S. Svd-based modeling for image texture classification using wavelet transformation. *IEEE Transactions on Image Processing*, 16(11):2688–2696, 2007.

- [147] Kwitt, R. and Uhl, A. Lightweight probabilistic texture retrieval. *IEEE Transactions on Image Processing*, 19(1):241–253, 2009.
- [148] Choy, S.-K. and Tong, C.-S. Statistical wavelet subband characterization based on generalized gamma density and its application in texture retrieval. *IEEE Transactions on Image Processing*, 19(2):281–289, 2009.
- [149] Saha, A. and Wu, Q. J. Facial expression recognition using curvelet based local binary patterns. In *2010 IEEE International Conference on Acoustics, Speech and Signal Processing*, pages 2470–2473. IEEE, 2010.
- [150] Allili, M. S. Wavelet modeling using finite mixtures of generalized gaussian distributions: application to texture discrimination and retrieval. *IEEE Transactions on Image Processing*, 21(4):1452–1464, 2011.
- [151] Nagaraja, S., Prabhakar, C., and Kumar, P. P. Complete local binary pattern for representation of facial expression based on curvelet transform. In *International Conference on Multimedia Processing, Communication and Information Technology (MPCIT)*, pages 48–56, 2013.
- [152] Dubey, S. R., Singh, S. K., and Singh, R. K. Local wavelet pattern: a new feature descriptor for image retrieval in medical ct databases. *IEEE Transactions on Image Processing*, 24(12):5892–5903, 2015.
- [153] Shinde, A. A., Rahulkar, A. D., and Patil, C. Y. Fast discrete curvelet transform-based anisotropic feature extraction for biomedical image indexing and retrieval. *International Journal of Multimedia Information Retrieval*, 6(4):281–288, 2017.
- [154] Srivastava, P. and Khare, A. Content-based image retrieval using local binary curvelet co-occurrence pattern: a multiresolution technique. *The Computer Journal*, 61(3):369–385, 2018.
- [155] Yang, P. and Yang, G. Statistical model and local binary pattern based texture feature extraction in dual-tree complex wavelet transform domain. *Multidimensional Systems and Signal Processing*, 29(3):851–865, 2018.
- [156] Wang, H., Qu, H., Xu, J., Wang, J., Wei, Y., and Zhang, Z. Combining statistical features and local pattern features for texture image retrieval. *IEEE Access*, 8:222611–222624, 2020.
- [157] Shinde, A., Rahulkar, A., and Patil, C. Content based medical image retrieval based on new efficient local neighborhood wavelet feature descriptor. *Biomedical engineering letters*, 9(3):387–394, 2019.

- [158] Kumar, T. and Nagarajan, V. Local contourlet tetra pattern for image retrieval. *Signal, Image and Video Processing*, 12(3):591–598, 2018.
- [159] He, J., Ji, H., and Yang, X. Rotation invariant texture descriptor using local shearlet-based energy histograms. *IEEE Signal Processing Letters*, 20(9):905–908, 2013.
- [160] Purkait, P. S., Roy, H., and Bhattacharjee, D. Local shearlet energy gammodian pattern (lsegp): a scale space binary shape descriptor for texture classification. In *Intelligence enabled research*, pages 123–131. Springer, 2020.
- [161] Alinsaif, S. and Lang, J. Texture features in the shearlet domain for histopathological image classification. *BMC Medical Informatics and Decision Making*, 20(14):1–19, 2020.
- [162] Yang, J., Jiang, Y.-G., Hauptmann, A. G., and Ngo, C.-W. Evaluating bag-of-visual-words representations in scene classification. In *Proceedings of the international workshop on Workshop on multimedia information retrieval*, pages 197–206, 2007.
- [163] Guo, K., Kutyniok, G., and Labate, D. Sparse multidimensional representations using anisotropic dilation and shear operators. *Wavelets and splines*, 14:189–201, 2006.
- [164] Labate, D., Lim, W.-Q., Kutyniok, G., and Weiss, G. Sparse multidimensional representation using shearlets. In *Wavelets XI*, volume 5914, pages 254–262. SPIE, 2005.
- [165] Guo, K. and Labate, D. Optimally sparse multidimensional representation using shearlets. *SIAM journal on mathematical analysis*, 39(1):298–318, 2007.
- [166] Burt, P. J. and Adelson, E. H. The laplacian pyramid as a compact image code. In *Readings in computer vision*, pages 671–679. Elsevier, 1987.
- [167] Da Cunha, A. L., Zhou, J., and Do, M. N. The nonsubsampling contourlet transform: theory, design, and applications. *IEEE transactions on image processing*, 15(10):3089–3101, 2006.
- [168] Hou, B., Zhang, X., Bu, X., and Feng, H. Sar image despeckling based on nonsubsampling shearlet transform. *IEEE Journal of selected topics in applied earth observations and remote sensing*, 5(3):809–823, 2012.

- [169] Zhang, X. and Jing, X. Image denoising in contourlet domain based on a normal inverse gaussian prior. *Digital Signal Processing*, 20(5):1439–1446, 2010.
- [170] Karlis, D. An em type algorithm for maximum likelihood estimation of the normal–inverse gaussian distribution. *Statistics & probability letters*, 57(1):43–52, 2002.
- [171] Hazarika, D. *Despeckling of synthetic aperture radar (SAR) images in the lapped transform domain*. PhD thesis, Tezpur University, India, 2017.
- [172] Hazarika, D., Nath, V. K., and Bhuyan, M. Sar image despeckling based on a mixture of gaussian distributions with local parameters and multiscale edge detection in lapped transform domain. *Sensing and Imaging*, 17(1):15, 2016.
- [173] Nath, V. Statistical modeling of lapped transform coefficients and its applications. *Ph. D. Dissertation, Indian Institute of Technology Guwahati (IITG), Deptt. of Electronics and Electrical Engineering*, 2011.
- [174] Xia, G.-S., Yang, W., Delon, J., Gousseau, Y., Sun, H., and Matre, H. Structural high-resolution satellite image indexing. Vienna, Austria, 2010.
- [175] Dai, D. and Yang, W. Satellite image classification via two-layer sparse coding with biased image representation. *IEEE Transactions on Geoscience and Remote Sensing*, 8(1):173–176, 2011.
- [176] Xia, G.-S., Hu, J., Hu, F., Shi, B., Bai, X., Zhong, Y., Zhang, L., and Lu, X. Aid: A benchmark data set for performance evaluation of aerial scene classification. *IEEE Transactions on Geoscience and Remote Sensing*, 55(7):3965–3981, 2017.
- [177] AID. <http://www.lmars.whu.edu.cn/xia/aid-project.html>. Online, Last accessed on 2018.
- [178] Zhou, W., Newsam, S., Li, C., and Shao, Z. Patternnet: A benchmark dataset for performance evaluation of remote sensing image retrieval. *ISPRS journal of photogrammetry and remote sensing*, 145:197–209, 2018.
- [179] PatternNet. <https://sites.google.com/view/zhouwax/dataset>, Last accessed 2018.
- [180] Napoletano, P. Visual descriptors for content-based retrieval of remote sensing images. *International journal of remote sensing*, 39(5), 2018.

- [181] Baruah, H. G., Nath, V. K., and Hazarika, D. Remote sensing image retrieval via symmetric normal inverse gaussian modeling of nonsampled shearlet transform coefficients. *International Conference on Pattern Recognition and Machine Intelligence*, pages 359–368, Tezpur, India, 2019.
- [182] Ojala, T., Pietikäinen, M., and Harwood, D. A comparative study of texture measures with classification based on featured distributions. *Pattern recognition*, 29(1):51–59, 1996.
- [183] Ojala, T., Pietikäinen, M., and Mäenpää, T. Multiresolution gray-scale and rotation invariant texture classification with local binary patterns. *IEEE Transactions on Pattern Analysis & Machine Intelligence*, (7):971–987, 2002.
- [184] Hanbury, A., Kandaswamy, U., and Adjeroh, D. A. Illumination-invariant morphological texture classification. *Mathematical Morphology: 40 Years On*, pages 377–386, 2005.
- [185] Bianconi, F., Harvey, R. W., Southam, P., and Fernández, A. Theoretical and experimental comparison of different approaches for color texture classification. *Journal of Electronic Imaging*, 20(4):043006, 2011.
- [186] Bianconi, F. and Fernández, A. Evaluation of the effects of gabor filter parameters on texture classification. *Pattern recognition*, 40(12):3325–3335, 2007.
- [187] Liu, Z., Wang, S., and Tian, Q. Fine residual vlad for image retrieval. *Neurocomputing*, 173:1183–1191, 2016.
- [188] Liu, Z. and Zhu, L. A novel retrieval method for remote sensing image based on statistical model. *Multimedia Tools and Applications*, 77:24643–24662, 2018.
- [189] Choy, S. K. and Tong, C. S. Statistical wavelet subband characterization based on generalized gamma density and its application in texture retrieval. *IEEE Transactions on Image Processing*, 19(2):281–289, February 2010.
- [190] Rabbani, H., Vafadust, M., Abolmaesumi, P., and Gazor, S. Speckle noise reduction of medical ultrasound images in complex wavelet domain using mixture priors. *IEEE Transactions on Biomedical Engineering*, 55(9):2152–2160, September 2008.

- [191] Banerji, S., Sinha, A., and Liu, C. New image descriptors based on color, texture, shape, and wavelets for object and scene image classification. *Neurocomputing*, 117:173–185, 2013.
- [192] Ojala, T., Matti, P., and Topi, M. Multiresolution gray-scale and rotation invariant texture classification with local binary patterns. *IEEE Transactions on Pattern Analysis & Machine Intelligence*, 24(7):971–987, 2002.
- [193] Bianconi, F. and Fernández, A. Evaluation of the effects of gabor filter parameters on texture classification. *Pattern recognition*, 40(12):3325–3335, 2007.
- [194] Florent, P., Jorge, S., and Thomas, M. Improving the fisher kernel for large-scale image classification. *European conference on computer vision (ECCV)*, pages 143–156, Heraklion, Crete, Greece, 2010.
- [195] Hervé, J., Matthijs, D., Cordelia, S., and Patrick, P. Aggregating local descriptors into a compact image representation. *IEEE computer society conference on computer vision and pattern recognition*, pages 3304–3311, San Francisco, CA, USA, 2010.
- [196] Selvan, S. and Ramakrishnan, S. Svd-based modeling for image texture classification using wavelet transformation. *IEEE transactions on image processing*, 16(11):2688–2696, 2007.
- [197] Nema-ct image database. Online, Last accessed on 2016.
- [198] The cancer imaging archive. Online, Last accessed on 2021.
- [199] Cardiac mri dataset-york university. Online, Last accessed on 2021.
- [200] Dubey, S. R., Singh, S. K., and Singh, R. K. Local diagonal extrema pattern: a new and efficient feature descriptor for ct image retrieval. *IEEE Signal Processing Letters*, 22(9):1215–1219, 2015.
- [201] Dubey, S. R., Singh, S. K., and Singh, R. K. Local wavelet pattern: a new feature descriptor for image retrieval in medical ct databases. *IEEE Transactions on Image Processing*, 24(12):5892–5903, 2015.
- [202] Kumar, T. G. S. and Nagarajan, V. Local contourlet tetra pattern for image retrieval. *Signal, Image and Video Processing*, 12:591598, 2018.
- [203] Grosky, W. I. and Mehrotra, R. Index-based object recognition in pictorial data management. *Computer vision, Graphics, and Image processing*, 52(3):416–436, 1990.

- [204] Milios, E. and Petrakis, E. G. Shape retrieval based on dynamic programming. *IEEE Transactions on Image Processing*, 9(1):141–147, 2000.
- [205] Belongie, S., Malik, J., and Puzicha, J. Shape matching and object recognition using shape contexts. *IEEE transactions on pattern analysis and machine intelligence*, 24(4):509–522, 2002.
- [206] Hoyneck, M. and Ohm, J.-R. Shape retrieval with robustness against partial occlusion. In *2003 IEEE International Conference on Acoustics, Speech, and Signal Processing, 2003. Proceedings.(ICASSP'03).*, volume 3, pages III–593. IEEE, 2003.
- [207] Kim, H.-K., Kim, J.-D., Sim, D.-G., and Oh, D.-I. A modified zernike moment shape descriptor invariant to translation, rotation and scale for similarity-based image retrieval. In *2000 IEEE International Conference on Multimedia and Expo. ICME2000. Proceedings. Latest Advances in the Fast Changing World of Multimedia (Cat. No. 00TH8532)*, volume 1, pages 307–310. IEEE, 2000.
- [208] Zhang, D. and Lu, G. Content-based shape retrieval using different shape descriptors: A comparative study. In *IEEE International Conference on Multimedia and Expo, 2001. ICME 2001.*, pages 289–289. Citeseer, 2001.
- [209] Rajwade, A., Rangarajan, A., and Banerjee, A. Image denoising using the higher order singular value decomposition. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 35(4):849–862, 2012.
- [210] Manchanda, M. and Gambhir, D. Channel noise reduction for compressed images using singular value decomposition. In *2014 5th International Conference-Confluence The Next Generation Information Technology Summit (Confluence)*, pages 613–618. IEEE, 2014.
- [211] Rawat, S. and Raman, B. Best tree wavelet packet transform based copyright protection scheme for digital images. *Optics Communications*, 285(10-11):2563–2574, 2012.
- [212] Makbol, N. M. and Khoo, B. E. A new robust and secure digital image watermarking scheme based on the integer wavelet transform and singular value decomposition. *Digital Signal Processing*, 33:134–147, 2014.
- [213] Mardanpour, M. and Chahooki, M. A. Z. Robust transparent image watermarking with shearlet transform and bidiagonal singular value decomposition. *AEU-International Journal of Electronics and Communications*, 70(6):790–798, 2016.

- [214] Rufai, A. M., Anbarjafari, G., and Demirel, H. Lossy image compression using singular value decomposition and wavelet difference reduction. *Digital signal processing*, 24:117–123, 2014.
- [215] Jian, M. and Lam, K.-M. Face-image retrieval based on singular values and potential-field representation. *Signal processing*, 100:9–15, 2014.
- [216] Diaw, M., Agnès, Landré, J., Retraint, F., and Morain-Nicolier, F. Modeling a local dissimilarity map with weibull distribution—application to 2-class and multi-class image classification. *IEEE Access*, 10:35750–35767, 2022.
- [217] Yang, H.-y., Liang, L.-l., Zhang, C., Wang, X.-b., Niu, P.-p., and Wang, X.-y. Weibull statistical modeling for textured image retrieval using non-subsampled contourlet transform. *Soft Computing*, 23(13):4749–4764, 2019.

Publications based on thesis work

1. Journal

- **Baruah, H. G.**, Nath, V. K., and Hazarika, D. (2022) A Remote Sensing Image Retrieval Based on 3D-Local Ternary Pattern (LTP) features and Non-subsampled Shearlet Transform (NSST) Domain Statistical Features, **Computer Modeling in Engineering and Sciences**, 131(1), 137-164(SCIE)
- **Baruah, H. G.**, Nath, V. K., Hazarika, D., and Hatibaruah, R. (2022). Local bit-plane neighbour dissimilarity pattern in non-subsampled shearlet transform domain for bio-medical image retrieval. **Mathematical Biosciences and Engineering**, 19(2), 1609-1632(SCIE).
- **Baruah, H.G.**, Nath V.K. and Hazarika, D., CT image retrieval via blend of zernike moment based global shape features and non-subsampled shearlet transform (NSST) domain local texture features. (**Manuscript under preparation**)
- **Baruah, H.G.**, Nath V.K. and Hazarika, D., Biomedical image retrieval using ZM and SVD based statistical modeling in NSST domain. (**Manuscript under preparation**)

2. Book Chapter

- **Baruah, H. G.**, Nath, V. K., and Hazarika, D. (2019). Remote sensing image retrieval via symmetric normal inverse Gaussian modeling of nonsubsampling shearlet transform coefficients. **In International Conference on Pattern Recognition and Machine Intelligence** (pp. 359-368). Springer, Cham.