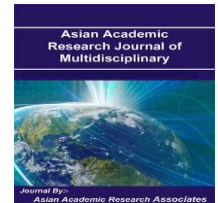




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## IMAGE PROCESSING A NEW ERA IN THE STUDY OF NATURAL POLYMER COMPOSITES

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### Abstract

Image processing is one of the fundamentals of various intelligence systems based on data analysis. It is caused by that the significant part of information about outward things can be received on the basis of the video data analysis about images of the real world. As an example, we reviewed the methodology of image processing in the study of polymer composites. Such analysis uses various methods, approaches and theories where the special place is occupied by the procedures connected with recognition of scenes or separate objects, presented on incoming images. In general, this allows to us to improve the properties of fiber as a reinforcing agent in polymer composites.

**Keywords:** analysis of image objects, image processing, filtration, histogram equalization, polymer compositions, segmentation, structure.

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## References

- [1] Sreekumar, P. A., Thomas, S. P., Marc Saiter, J., Joseph, K., Unnikrishnan, G., and Thomas, S., "Effect of fiber surface modification on the mechanical and water absorption characteristics of sisal/polyester composites fabricated by resin transfer molding", *Composites Part A: Applied Science and Manufacturing*, 40(11), (2009), pp. 1777-1784.
- [2] Alveera Khan, M. Ayaz Ahmad, Shrish J., Abd. El-Khalek A. M., "Study of Mechanical and Electrical Behavior of Chemically Treated Coir Fibre Reinforced Epoxy Composites", *Int. J. of Multidisciplinary Research & Advcs. in Engg. (IJMRAE)*, Vol. 5 (II), (2013), pp. 171-180.
- [3] Alveera Khan, M. Ayaz Ahmad, Shirish Joshi, Said A. F. Al Said, "Abrasive Wear Behavior of Chemically Treated Coir Fibre Filled Epoxy Polymer Composites", *American Journal of Mechanical Engineering and Automation*. Vol. 1, No. 1, (2014), pp. 1-5.
- [4] Alveera Khan, M. Ayaz Ahmad, S. Joshi and Vyacheslav V. Lyashenko, "Dielectric and Electrical Characterization Study of Synthesized Alumina Fibre Reinforced Epoxy Composites", *Elixir Crystal*, 87, (2015), pp. 35801-35805.
- [5] Sanadi, A. R., Prasad, S. V., and Rohatgi, P. K., "SEM observations on the origins of toughness of natural fibre - polyester composites", *Journal of Materials Science Letters*, 5(4), (1986), pp. 395-396.
- [6] Mishra, S., Mohanty, A. K., Drzal, L. T., Misra, M., Parija, S., Nayak, S. K., and Tripathy, S. S., "Studies on mechanical performance of biofibre/glass reinforced polyester hybrid composites", *Composites Science and Technology*, 63(10), (2003), pp.1377-1385.
- [7] Ray, D., Sarkar, B. K., Rana, A. K., and Bose, N. R., "Effect of alkali treated jute fibres on composite properties", *Bulletin of Materials Science*, 24(2), (2001), pp.129-135.
- [8] Chand, N., and Dwivedi, U. K., "Effect of coupling agent on abrasive wear behaviour of chopped jute fibre-reinforced polypropylene composites", *Wear*, 261(10), (2006), pp. 1057-1063.
- [9] Alveera Khan, A., S. Joshi, M. Ayaz Ahmad, and Vyacheslav V. Lyashenko, "Some Effect of Chemical Treatment by Ferric Nitrate Salts on the Structure and Morphology of Coir Fibre Composites", *Advances in Materials Physics and Chemistry*, 5(01), (2015), pp. 39-45.
- [10] Z Zeng, W Ren, C Xu, W Lu, Y Zhang, "Maleated Natural Rubber Prepared through Mechanochemistry and Its Coupling Effects on Natural Rubber/Cotton Fiber Composites", *Journal of Polymer Research*, 17, (2010), pp.213-219. doi.org/10.1007/s10965-009-9307-6
- [11] M. M. Thwe, K. Liao, "Effects of environmental aging on the mechanical properties of polymer matrix hybrid composites", *Composites Part A* 33 (2002) 43-52.
- [12] Hashmi, S. A. R., Dwivedi, U. K., and Chand, N., "Graphite modified cotton fibre reinforced polyester composites under sliding wear conditions", *Wear*, 262(11), (2007), pp.1426-1432.
- [13] Vyacheslav Lyashenko, Oleg Kobylin, and M. Ayaz Ahmad, "General Methodology for Implementation of Image Normalization Procedure Using its Wavelet Transform", *International Journal of Science and Research (IJSR)*, 3(11), (2014), pp. 2870-2877.
- [14] Van De Ville, D., Nachttegael, M., Van der Weken, D., Kerre, E. E., Philips, W., and Lemahieu, I., "Noise reduction by fuzzy image filtering", *Fuzzy Systems, IEEE Transactions on*, 11(4), (2003), pp. 429-436.

- [15] Ji, L., and Yi, Z., "A mixed noise image filtering method using weighted-linking PCNNs", *Neurocomputing*, 71(13), (2008), pp. 2986-3000.
- [16] Felzenszwalb, P. F., and Huttenlocher, D. P., "Efficient graph-based image segmentation", *International Journal of Computer Vision*, 59(2), (2004), pp.167-181.
- [17] L. Grady, "Random walks for image segmentation", *Pattern Analysis and Machine Intelligence, IEEE Transactions on*, 28(11), (2006), pp. 1768-1783.
- [18] Ramos, C., Augusto, J. C., and Shapiro, D. "Ambient intelligence - The next step for artificial intelligence", *Intelligent Systems, IEEE*, 23(2), (2008), pp. 15-18.
- [19] He, L., Peng, Z., Everding, B., Wang, X., Han, C. Y., Weiss, K. L., and Wee, W. G., "A comparative study of deformable contour methods on medical image segmentation", *Image and Vision Computing*, 26(2), (2008), pp. 141-163.
- [20] S. Ganapathy, (1984, March). "Decomposition of transformation matrices for robot vision", In *Robotics and Automation. Proceedings. 1984 IEEE International Conference on* (Vol. 1, pp. 130-139). IEEE.
- [21] Vyacheslav V. Lyashenko, Mohammad Ayaz Ahmad, Valentin A. Lyubchenko, Alveera Khan and Oleg A. Kobylin, "The Methodology of Image Processing in the Study of the Properties of Fiber as a Reinforcing Agent in Polymer Compositions", *International Journal of Advanced Research in Computer Science (IJCSR)*, Vol. 7(1), (2016), pp. 16-18.
- [22] Alveera Khan, Shirish Joshi and M. Ayaz, "A systematic study for electrical properties of chemically treated coir fiber reinforced epoxy composites with ANN model", *International Journal of Science and Research (IJSR)*, Vol. 4(1), 2015, pp. 410-414.
- [23] Alveera K. S. Joshi, Vyacheslav L. , Nicolina P. and M. Ayaz Ahmad, "Artificial Neural Networking (ANN) Treatment on Electrical Properties of Coir Fiber Reinforced Epoxy Composites", paper accepted in the "Saudi International Meeting on Frontiers of Physics" (SIMFP), 2015, at February 17-19, 2015 Jazan University, Saudi Arabia.
- [24] Alveera Khan, A. M. Quraishi, S. Joshi, and M. Ayaz Ahmad, "Synthesis and Characterization of Chemically Treated Fibre and its Reinforced Epoxy Polymer Composites", *Mathematical Sciences International Research Journal*, Vol. 2(2), (2013), pp. 673-676.
- [25] Anghel Drugarin Cornelia Victoria, M. Ayaz Ahmad, N. Ameer Ahmad, Draghici Silviu. (2015). The Mathematical Study of Data Transmission in Digital Electronics. *International Journal of Advanced Research (IJAR)*. 3(3): 697- 702.
- [26] Anghel Drugarin Cornelia Victoria, M. Ayaz Ahmad, N. Ameer Ahmad, Vyacheslav V. Lyashenko. (2015). Algorithmic Research and Application Using the Rayleigh Method", *International Journal of Science & Research (IJSR)*. 4(4): 1669-1671.
- [27] Dragos Pasculescu, Remus Dobra and M. Ayaz Ahmad (2016). Dosimetric Quantity System for Electromagnetic Fields Bio-effects", *International Journal of Scientific Research*, Vol. 5(2), (2016), 26-32.