Himanshu Mittal

Ph.D. in Computer Vision
Jaypee Institute of Information Technology, India

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Research & Development Project

- **Design and Development of a Cognitive System for Leukocytes Identification in Hematoxylin and Eosin Stained Images.** ***(Ongoing)***
  Co-Principal Investigator, SERB-DST, New Delhi

Ph.D. Thesis

- **Design and Development of Efficient Clustering Methods for Image Segmentation.** ***(Submitted)***
  Supervisor: Dr. Mukesh Saraswat, Jaypee Institute of Information Technology, Noida
  - A novel cluster validity index has been proposed to identify the optimal cluster number.
  - A meta-heuristic based superpixel clustering method has been developed to perform segmentation.
  - A new non-local means 2D histogram has been proposed for multi-level image segmentation.

Publications

- **Himanshu Mittal** and Mukesh Saraswat, *"An automatic nuclei segmentation method using intelligent gravitational search algorithm based superpixel clustering"*, Swarm and Evolutionary Computation, vol. 45, pp. 15-32, 2019. (SCI Indexed. Impact Factor: 6.3)

- **Himanshu Mittal** and Mukesh Saraswat, *"An optimum multi-level image thresholding segmentation using non-local means 2D histogram and exponential Kbest gravitational search algorithm"*, Engineering Applications of Artificial Intelligence, vol. 71, pp. 226-235, 2018. (SCI Indexed. Impact Factor: 3.6)

- **Himanshu Mittal** and Mukesh Saraswat, *"An image segmentation method using logarithmic kbest gravitational search algorithm based superpixel clustering"*, Evolutionary Intelligence, vol. 12, pp. 1-13, 2018. (Scopus Indexed.)

- **Himanshu Mittal**, Raju Pal and Mukesh Saraswat, *"Histopathological Image Classification by Optimized Neural Network using IGSA"*, in Lecture Notes of Springer International Conference on Distributed Computing and Internet Technology, 2020. *(Accepted)*

- **Himanshu Mittal** and Mukesh Saraswat, *"Classification of histopathological images through bag-of-visual-words and gravitational search algorithm"*, in Lecture Notes of Springer International Conference on Soft Computing for Problem Solving, India, pp. 231-241, 2018.

- **Himanshu Mittal** and Mukesh Saraswat, *"cKGSA based fuzzy clustering method for image segmentation of RGB-D images"*, in Proc. of IEEE International Conference on Contemporary Computing, India, pp. 1-6, 2018.

- **Himanshu Mittal**, Raju Pal, Ankur Kulhari, and Mukesh Saraswat, *"Chaotic Kbest gravitational search algorithm (CKGSA)"*, in Proc. of IEEE International Conference on Contemporary Computing, India, pp. 11-13, 2016.

- **Mittal, Himanshu**, *"Diffie-Hellman Based Smart-Card Multi-server Authentication Scheme"*, in Proc. of IEEE International Conference on Computational Intelligence and Communication Networks, India, pp. 14-16, 2014.

- **Himanshu Mittal** and Mukesh Saraswat, "A new fuzzy cluster validity index for hyper-ellipsoid or hyper-spherical shape close clusters with distant centroids", IEEE Transactions on Fuzzy Systems. *(Communicated)*

Professional Experience

- **Jaypee Institute of Information Technology** — Noida, India
  Assistant Professor (Grade II) — *Feb. 2013 - Present*
- **Galgotias University** — Gr. Noida, India
  Assistant Professor — *Aug. 2012 - Feb. 2013*

Education

- **M. Tech. in Computer Science** — Aug. 2010 – July. 2012
  Delhi Technological University (Formerly Delhi College of Engineering) — *New Delhi, India*
- **B.Tech. in Information Technology** — Aug. 2006 – July. 2010
  Gautam Budha Technical University — *Gr. Noida, India*

Projects

- **Neuroevolution using Evolutionary Algorithm:** The program evolves the neural network using a evolutionary algorithm to obtain the optimal parameters of the considered network on a particular application.
- **Unsupervised learning using Evolutionary Algorithm:** The program generates optimal clusters using a evolutionary algorithm to perform unsupervised learning.
- **2D histogram multi-level threshold image segmentation using Non-local means and Evolutionary Algorithm:** The program generates a 2D histogram of a color image using Non-local means which is partitioned according to optimal thresholds which identified through exponential kbest gravitational search algorithm and Renyi Entropy.
- **Classification and feature selection using Evolutionary Algorithm:** To eliminate redundant features in a data, the program selects optimal features using gravitational search algorithm. The optimal feature set is used to train a machine learning model like support vector machine to perform the classification.
- **QR code Generator for Opened Tabs:** This program generates the QR code for all the tabs opened in a browser.
- **Road Detection using Superpixel and Neural Network:** This program uses Superpixel to identify uniform regions in an image which are further analysed for the detection of road using neural network.
- **GUI for BibTex Key Extractor:** This GUI extracts the BibTex key for all the list of research papers saved in a file from Google scholar.
- **Object Classification and Image Segmentation using Evolutionary Algorithm:** Segmenting ROI in an image using differential evolution which are further classified as objects of various shapes using Support Vector Machine.

Research Interests

- Computer Vision, Machine Learning, Deep Learning, Evolutionary Algorithms, Pattern Recognition

Programming Skills

- Python, MATLAB, Tensorflow, Keras, Javascript, HTML, node.js, Java, C

References

- **Dr. Mukesh Saraswat** — mukesh.saraswat@jiit.ac.in
  Associate Professor, Jaypee Institute of Information Technology, Noida
- **Dr. Daya Gupta** — d.gupta@dce.ac.in
  Professor, Department of Computer Science, DTU, New Delhi