Dr. ALOK KUMAR SINGH KUSHWAHA
Associate Professor & HOD
Department of Computer Science & Engineering
Guru Ghasidas Vishwavidyalaya, Bilaspur, India
Contact No.: +91-8090631394
E-Mail Id: alokkushwaha@ggu.ac.in

Academic Qualification

- **Ph.D. in Computer Science and Engineering**
  Course CGPA- 9.5 out of 10 From
  IIT (BHU), Varanasi, India

Teaching Experience: 10+ Years

Research Area:

- Image Processing, Computer Vision, Pattern Classification, Video Surveillance.
- Artificial Intelligence, Machine Learning, Deep Learning, and Related fields.
- Medical Image Processing and Pattern Recognition, Algorithms.

Courses Taught:

Computer Graphics, Image Processing, Computer Vision, Pattern Recognition, Machine Learning, Design and Analysis of Algorithms, Data Structures, Operating System, Computer Organisation and Architecture, Software Engineering, Programming Languages, Simulation and Modeling, Distributed Databases, Robotic Vision, Artificial Intelligence.

Courses Developed:

Computer Graphics, Image Processing, Computer Vision, Operating System, Computer Networks, Software Engineering, Programming Languages.

Labs Developed:

- Research Lab
- Computer Network Lab

Papers Published in SCI Journal

- **Alok Kumar Singh Kushwaha**, Rajeev Srivastava, **"Automatic Moving Object Segmentation Methods Under Varying Illumination Conditions for Video Data: Comparative Study, and an Improved Method"**, Multimedia Tools and Applications, Springer, Volume 75, Issue 23, pp. 16209–16264, 2015, doi: 10.1007/s11042-015-2927-4 (Published). **[SCI Impact Factor – 1.53].**

- **Alok Kumar Singh Kushwaha**, Rajeev Srivastava, "**Multi-View Human Activity Recognition Based on Silhouette and Uniform Rotation Invariant Local Binary Patterns**", Multimedia Systems, Springer, pp. 451-467, 2016, doi: 10.1007/s00530-016-0505-x (Published). **[SCI Impact Factor – 2.01].**

- **Alok Kumar Singh Kushwaha**, Rajeev Srivastava, "**Maritime Object Segmentation using Dynamic Background Modeling and Shadow Suppression**", The Computer Journal, Oxfords, Volume 59, Issue 9, Pages 1303–1329, 2015, doi:10.1093/comjnl/bxv091 (Published). **[SCI Impact Factor – 1.0].**

- **Alok Kumar Singh Kushwaha**, Rajeev Srivastava, "**Framework for Dynamic Background Modeling and Shadow Suppression for Moving Object Segmentation in Complex Wavelet Domain**" , Journal of Electronic Imaging, SPIE, Volume 24(5) pp. 051005, 2015 doi: 10.1117/1.JEI.24.5.051005 (Published) **[SCI Impact Factor - 0.84].**

- **Alok Kumar Singh Kushwaha**, Rajeev Srivastava, "**Multi-View Human Activity Recognition System Based on Spatio-Temporal Template for Video Surveillance System**", Journal of Electronic Imaging, SPIE, Volume 24(5), pp. 051004, 2015. doi: 10.1117/1.JEI.24.5.051004. (Published) **[SCI Impact Factor - 0.84].**

- **Alok Kumar Singh Kushwaha**, Chandra Mani Sharma, Manish Khare, Om Prakash and Ashish Khare, "**Adaptive Real-Time Motion Segmentation Technique Based on Statistical Background Model**", The Imaging Science Journal (ISSN: 1743-131X), Vol. 62, No. 5, pp. 285-302, 2014. (Published) **[SCI Impact Factor - 0.506].**

- **Alok Kumar Singh Kushwaha**, Rajeev Srivastava, "**A Framework for Moving Object Segmentation using Dynamic Background Modeling and Shadow Suppression in Complex Wavelet Domain**", Imaging Science Journal, Volume 64, pp. 267-278, 2017 (ISSN: 1743-131X), http://dx.doi.org/10.1080/13682199.2016.1176725. (Published). **[SCI Impact Factor – 0.506].**

- **Alok Kumar Singh Kushwaha**, Rajeev Srivastava, "**A Framework of Moving Object Segmentation in Maritime Surveillance inside a Dynamic Background**", Transactions on Computational Science XXV Springer, LNCS 9030, pp. 35–54, 2015. (Published) **[SCI Impact Factor – 0.15]**

- **Alok Kumar Singh Kushwaha**, Jagwinder, Roshan Singh, Rajeev Srivastava **"Depth based Enlarged Temporal Dimension of 3D deep Convolutional Network for Activity Recognition"**, Multimedia Tools and Applications, Springer, pp. 30599–30614, 2019. https://link.springer.com/article/10.1007%2Fs11042-018-6425-3 (Published) **[SCI Impact Factor – 1.53]**

- **Alok Kumar Singh Kushwaha**, Roshan Singh, and Rajeev Srivastava, "**Multi-View Human Activity Recognition System Based on Multiple Features for Video Surveillance System**", Multimedia Tools and Applications, Springer, pp. 17165–17196, 2019. https://link.springer.com/article/10.1007%2Fs11042-018-7108-9 (Published) **[SCI Impact Factor – 1.53]**

- **Alok Kumar Singh Kushwaha**, Roshan Singh, and Rajeev Srivastava, **"Combining CNN Streams of Dynamic Image and Depth Data for Action Recognition in Real Time"**, Multimedia System, Springer, pp. 313–322, 2020 https://link.springer.com/article/10.1007/s00530-019-00645-5?shared-article-renderer (Published) **[SCI Impact Factor – 2.01]**

- **Alok Kumar Singh Kushwaha**, Roshan Singh, and Rajeev Srivastava, "**A Dual Stream Model for Activity Recognition: Exploiting Residual- CNN with Transfer Learning**", Computer Methods in Biomechanics and Biomedical Engineering: Imaging, Vol 9, 20 https://doi.org/10.1080/21681163.2020.1805798 (Published) **[SCI Impact Factor – 1.08]**

- **Alok Kumar Singh Kushwaha,** Neeraj Varshney, Brijesh Bakariya, , Manish Khare**,** "Rule-based Multi-view human activity recognition system in Real time using skeleton data from RGB-D Sensor"**,** Soft Computing, 2021 https://doi.org/10.1007/s00500-021-05649-w (Published)**[SCI Impact Factor – 3.050]**

- **Alok Kumar Singh Kushwaha,** Neeraj Varshney, Brijesh Bakariya, , Manish Khare**,** " Human Activity Recognition Using Deep Transfer Learning of Cross Position Sensor Based on Vertical Distribution of Data", Multimedia Tools and Applications, Springer, 2021 (Accepted) **[SCI Impact Factor – 1.53**

Papers Published in Non-SCI and Scopus Journals

- Chandra Mani Sharma**, Alok Kumar Singh Kushwaha,** Rakesh Roshan, Rabins Porwal and Ashish Khare, "**Intelligent Video Object Classification Scheme using Offline Feature Extraction and Machine Learning based Approach**", International Journal of Computer Science Issues , vol. 9, no. 3, pp. 247-256, 2012 [ISSN No. 1694-0814]. (Published)

- Om Prakash**,** Manish Khare, Chandra Mani Sharma, **Alok Kumar Singh Kushwaha,** "**Moving Object Tracking in Video Sequences based on Energy of Daubechies Complex Wavelet Transform**", International Journal of Computer Science Issues , pp. 6-10, 2012 [ISBN: 973-93-80871-12-3]. (Published)

- **Alok Kumar Singh Kushwaha**, Rajeev Srivastava, "**A Framework for Human Activity Recognition Using Pose Feature for Video Surveillance System**", International Journal of Computer Application, pp. 6-10, 2017. (Published)

- **Alok Kumar Singh Kushwaha**, Harpreet Singh, Dinesh Gupta, **"A Recent Survey on Multiclass Object Recognition and Classification based on Machine learning methods"**, International Journal of Engineering Research in Computer Science and Engineering, Vol. 5, Issue 7, July 2018. (Published)

- **Alok Kumar Singh Kushwaha**, Chandani, **"Deep Learning Trends for Video Based Activity Recognition: a Survey"**, International Journal of Sensors, Wireless Communications and Control (SWCC), **Volume 8, Issue 3,** 2018. http://www.eurekaselect.com/164184/article (Published) **(Scopus).**

- **Alok Kumar Singh Kushwaha**, Rajat Khurana, **"Fusing Dynamic Images and Depth Motion Maps for Action Recognition in Surveillance Systems"**, International Journal of Sensors, Wireless Communications and Control (SWCC), 2020 https://www.eurekaselect.com/node/177273/article/fusing-dynamic-images-and-depth-motion-maps-for-action-recognition-in-surveillance-systems (Published) **(Scopus)**.

Papers Presented/Published in International Conferences

- **Alok Kumar Singh Kushwaha**, Rajeev Srivastava, "A Framework for Moving Object Segmentation under Rapidly Changing Illumination Conditions in Complex Wavelet Domain," Futuristic Trends in Computational analysis and Knowledge management, Feb 25-27, 2015 at Amity University, Greater Noida, India, pp. 148–153 (DOI: 10.1109/ABLAZE.2015.7154985).

- Chandramani Sharma, **Alok Kumar Singh Kushwaha**, Ashish Khare and Sanjay Tanwani "**An Automatic Machine Learning And Particle Filtering Based Approach To Real Time Human Tracking In Video**" in Proc. **IEEE** Conference on Signal Processing and Real Time Operating System(SPRTOS 2011), pp. 290-295, HBTI Kanpur, Uttar Pradesh ,March 26-27 , 2011.

- Chandra Mani Sharma, **Alok Kumar Singh Kushwaha**, Swati Nigam, Ashish Khare , "Automatic Human Activity Recognition in Video using Background Modeling and Spatio-temporal Template Matching based Technique", In Proc. ACM International Conference on Advances in Computing and Artificial Intelligence (ACAI 2011), Punjab, pp. 97-101, 21 July,2011.

- Chandra Mani Sharma, **Alok Kumar Singh Kushwaha**, Swati Nigam, Ashish Khare, "On Human Activity Recognition in Video Sequences," in proc. of IEEE 2nd International conference on Computer and Communication Technology, MNNIT Allahabad, India during Sep. 15-17, pp. 152-158, 2011.

- **Alok Kumar Singh Kushwaha**, Anand Singh Jalal, "A Robust Object Classification Approach for Visual Surveillance", in proceeding of International Conference on Signal, Image and Video Processing (ICSIVP 2012), pp. 109-113, January 13-15, 2012 at Indian Institute of Technology, Patna.(ISBN: 978-93-81583-19-7).

- **Alok Kumar Singh Kushwaha**, Chandra Mani Sharma, Manish Khare, Rajneesh Kr Srivastava, Ashish Khare, "Automatic Multiple Human Detection and Tracking for Visual Surveillance System", in proceeding of IEEE International Conference on Informatics, Electronics & Vision (ICIEV12), pp. 326-331, May 18-19, 2012 in Dhaka, Bangladesh.

- **Alok Kumar Singh Kushwaha**, Mahesh kumar Kolekar and Ashish Khare, "Vision based method for object classification and multiple human activity recognition in video surveillance system", in proc. of CUBE International Information Technology Conference, 03-05 September, 2012, pp. 47-52, Pune, India.

- **Alok Kumar Singh Kushwaha**, Om Prakash, Ashish Khare and Mahesh k. kolekar, "Rule based Human Activity Recognition for Surveillance System", published in 4th International Conference on Intelligent Human Computer Interaction 2012 (IHCI 2012), Indian Institute of Technology Kharagpur, India during 27 – 29 December, 2012, pp. 1-6.
- Manish Khare, **Alok Kumar Singh Kushwaha**, Rajneesh Kumar Srivastava, and Ashish Khare, "An Approach towards wavelet transform based multiclass object classification", in proceeding of IEEE 6th International Conference on Contemporary Computing (IC3 2013), pp. 365-368, 8-10 August, 2013, Jaypee Institute of Information Technology, Noida, India.

- **Alok Kumar Singh Kushwaha**, Rajeev Srivastava, "Human Activity Recognition Using Object Silhouettes for Automatic Video Surveillance System," In Proc. International Conference on Recent cognizance in wireless communication & image processing-ICRCWIP-2014.

- **Alok Kumar Singh Kushwaha** and Rajeev Srivastava, "Performance Evaluation of Various Moving Object Segmentation Techniques for Intelligent Video Surveillance System," In Proc: IEEE International Conference on Signal Processing & Integrated Networks (SPIN 2014), 20-21 Feb'2014, Noida, India, pp. 196-201. (DOI: 10.1109/SPIN.2014.6776947).

- **Alok Kumar Singh Kushwaha** and Rajeev Srivastava, "Complex Wavelet Based Moving Object Segmentation using Approximate Median Filter Based Method for Video Surveillance," In Proc: 4th IEEE International Advanced Computing Conference, Gurgaon, India, 21-22 Feb' 2014, pp. 973-978. (DOI: 10.1109/IAdCC.2014. 6779455).

- Ishan Agarwal, **Alok Kumar Singh Kushwaha**, Rajeev Srivastava, "Weighted Fast Dynamic Time Warping Based Multi-View Human Activity Recognition Using a RGB-D Sensor", Published in NCVPRIPG 2015, Patna, India during 16-19 December, pp. 1-4. (DOI: 10.1109/NCVPRIPG.2015.7490046).

- **Alok Kumar Singh Kushwaha**, Jagwinder Dhillon and Chandani "A Recent Survey for Human Activity Recognition based on Deep Learning Approach" presented at Shimla, Fourth International Conference on Image Information Processing (ICIIP), Shimla, pp. 1-5, 2017.

- **Alok Kumar Singh Kushwaha**, Rajat Khurana and Chandani "Delving Deeper with Dual-Stream CNN for Activity Recognition" presented at International Conference on Emerging Trends Communication, Computing and Electronic, University of Allahabad, 2018.

- **Alok Kumar Singh Kushwaha**, Kamaljit Kaur and Rajat Khurana,"Deep Survey on Visual Object Tracking in Surveillance Environment", Accepted in 3rd IEEE International Conference on Research in Intelligent and Computing in Engineering,2018.

- **Alok Kumar Singh Kushwaha**, Harpreet Singh, Dinesh Gupta, "Multiclass Object Recognition and Classification using Boosting Technique" IEEE 9th international conference on computing, communication and networking technologies (ICCCNT), IISC Bengaluru, 10-12 July 2018. **(Published)**

- **Alok K. Singh Kushwaha**, Jagwinder, "Temporal Extension of 3D convolution on Depth Sequences for Activity Recognition", 4th International Conference on Computing, Communication, Control And Automation (ICC3A-2018), Aug 6-18, 2018, PCCOE, Pune, India. **(Published)**

- **Alok Kumar Singh Kushwaha**, Rajat Khurana, "Deep Learning Approaches for Human Activity Recognition in Video Surveillance - A Survey", First International Conference on Secure Cyber Computing and Communications, NIT Jalandhar, December 15-17, 2018. **(Published)**

- **Alok Kumar Singh Kushwaha**, Sandeep Kaur, "A Comparative study of various Video Tampering detection methods" , First International Conference on Secure Cyber Computing and Communications, NIT Jalandhar, December 15-17, 2018. **(Published).**

- **Alok Kumar Singh Kushwaha**, Neeraj Varshney, "Analysis of double compression detection in a video", IEEE- ISCON2019 to be organized by GLA University Mathura, India during November 21-22, 2019. **(Published).**

- **Alok Kumar Singh Kushwaha, Sonika Jindal, Monika Sachdeva, "**Deep Learning for Video based Human Activity Recognition: Review and Recent Developments**"** International Conference on Computational Intelligence and Emerging Power System organized by Engineering College Ajmer during March 09-10, 2021 **(Published).**

- **Alok Kumar Singh Kushwaha, Sonika Jindal, Monika Sachdeva, "**A Systematic Analysis of the Human Activity Recognition Systems for Video Surveillance**",** ICWSNUCA-2021 organized by Gokaraju Rangaraju Institute of Engineering & Technology, Hyderabad, India, during 26-27 February 2021 **(Published).**

Papers Presented/Published in National Conferences

- **Alok Kumar Singh Kushwaha,** Chandra Mani Sharma, and Ashish Khare, **"An Adaptive Real-time Motion Segmentation Technique Based on Average Frame Differencing,"** In the Proceedings of National Conference on Impact of Physics on Biological Science, pp.102-108, ECC Allahabad, 26thAugust, 2010.

Book Chapter Published

- **Alok Kumar Singh Kushwaha**, and Rajeev Srivastava, "Recognition of Humans and Their Activities for video Surveillance," in Research Developments in Computer Vision and Image Processing: Methodologies and Applications, R. Srivastava, S. K. Singh, K. K. Shukla (Indian Institute of Technology, (BHU), India)

National Patent Filed, Published and Granted: -

Indian Patent Published:- Theft Vehicle detection using digital signature based ECU and Image Processing, Patent Number: 202021025200.

International Patent Published and Granted: -

Australian Patent Granted:- An Unmanned Aerial Vehicle For Surveillance, Patent Number 202021045472.

Australian Patent Granted:- SBDA- Secured Bra for women safety, smart and secured bra for women safety based on Deep Learning Algorithms, Patent Number 2020102636.

Australian Patent Granted:- A System And A Method For Automated Irrigation Using Internet Of Things, Patent Number 2020104385

Australian Patent Granted:- Holonomic Drive Conveyor System And Its Method Using IoT, Patent Number 2020104116

Australian Patent Granted:- SELF-CLEANING AND GERM-KILLING REVOLVING PUBLIC TOILET FOR COVID 19, Patent Number 2021100059

Australian Patent Granted:- SMART BATHROOM SYSTEM AND METHOD, Patent Number 2021100780

Australian Patent Granted:- DELICATE VIBRATORY INSTRUMENT FOR NEONATES ORAL MOTOR SIMULATION, Patent Number 2021101385

Australian Patent Filed:- A SYSTEM AND METHOD FOR PREVENTING CORONA VIRUS TRANSMISSION, Patent Number 2021102958

Activities:

Invited Lectures /Session Chairs in international/National conferences and FDP

- Session Chair for the session "Image Analysis and Computer Vision" at International Conference on Emerging Trends in Communication, Computing and Electronics (IC3E-2018), J. K. Institute of Applied Physics and Technology (Department of Electronics and Communication), University of Allahabad, Allahabad, 14th April, 2018.
- Session Chair for the session "10th conference on Information Systems & Computer Networks (ISCON - 2019) at GLA University, Mathura, India. 22/11/2019.
- Invited talk on "Google Stock Market Prediction using LSTM RNN", Deep Learning and Big Data Analytics in Healthcare Applications organized by AICTE-ATAL and Panimalar Engineering College.
- Invited talk on "Digital Education during COVID-19 and e-Content Development" National e-Workshop under TEQIP-III, organized by Government Engineering College, Raipur

FDP/Workshop/Short-term courses/Orientation Courses:

Organized:

- Organize one week ATAL-AICTE FDP Program on Data Sciences during 12th- 16th Oct 2020 in GGV Bilaspur.
- Organize one week FDP Program on Deep Learning and Machine Learning Applications in Computer Vision during 12 August, 2020 to 18 August, 2020 organized by GGV Bilaspur and Electronics and ICT Academy, NIT Patna

Attended:

- **Attended Industrial Training on** CYBER SECURITY MEASURES AND TOOL from 22nd June to 03rd July 2020 in NITTR Chandigarh
- **Attended FDP on** Data Sciences from 04 May to 08 May 2020 in MNNIT Allahabad
- **Attended Orientation Course** in HRDC BHU Varanasi from 05-08-2019 to 24-08-2019.
- **Attend 5 days AICTE FDP** Program from 01-12-2019 to 05-12-2019 in IKGPTU Jalandhar
- **Attended Workshop on Business Analysis and Requirements Gathering**, 27th January-1st February 2010, Devi Ahilya University, Indore.
- **"National workshop on How to write for and Get Published in Scientific Journals and Publish manuscripts"**, this workshop was held at BHU, Varanasi, 24 Jan 2013.
- **"National workshop on Latex"**, this workshop was held at BHU, Varanasi, 03-09 Sep. 2013.
- **"National workshop on Probability and Fractional Calculus"**, this workshop was held at DST-BHU, Varanasi, 25-02 Feb 2013.
- **"Workshop on National Computational Grid (GBC 2013)"**, this workshop was held at IIT (BHU), Varanasi, 06-07 March 2013.
- **"Workshop on Mission Wipro 10X",** this workshop was held at GLA University, Mathura during 1-10 Nov. 2012.

Experience in Educational Administration:

- Head of Department in the Department of CSE, GGV Bilaspur
- NAAC Committee Member in GGV Bilaspur
- Co-ordinator, BOS in the Department of CSE, IKGPTU Jalandhar, Punjab.
- NAAC Committee Member in IKGPTU Jalandhar, Punjab.
- Member of Technical Purchase Committee in the Department of CSE, IKGPTU Jalandhar, Punjab.
- PhD and M.Tech Co-ordinator in the Department of CSE, IKGPTU Jalandhar, Punjab.
- E-Cell Co-ordinator in the Department of CSE, IKGPTU Jalandhar, Punjab.
- Warden, Boys Hostel, IKGPTU Jalandhar, Punjab

Member of Editorial Board

Guest Editor, Special issue on "Visual and Sensory Data Processing for Real Time Intelligent Surveillance System" of Multimedia Tools and Applications.

Reviewing Services

- IEEE Transactions on Image Processing
- IEEE Transactions on Multimedia
- IEEE Transactions on Information Forensics and Security
- IET Image Processing, IET Electronics Letters
- Information Fusion, Elsevier
- Journal of Visual Communication & Image Representation, Elsevier
- Neurocomputing, Elsevier
- Computers in Biology and Medicine, Elsevier
- The Visual Computer, Springer
- Signal, Image & Video Processing, Springer
- JEI, SPIE
- Imaging Science Journal, Many Publisher.
- International Journal of Computational Vision and Robotics (IJCVR), Inderscience
- International Journal of Biomedical Engineering and Technology, Inderscience

Technical Program Committee Member/ Advisory Board member

- International Advisory Board member in International Journal of Knowledge Discovery in Bioinformatics (IJKDB), IGI Global
- Program Committee Member & Reviewer in ICISA-2016 Conference.
- International Conference on Information Science and Security 2015, UPCON-2015 Conference

Membership of Professional Bodies

- Member of Institution of Communication Engineers and Information Technologists (ICEIT), Membership No. A1000034A
- Member of the Institution of Engineers (India), Membership No. AM1626550
- Member of Computer Society of India.

Projects Experience

- Successfully completed one year UGC Sponsored Project "Development of an Intelligent Video Surveillance System for Human Behaviour Analysis" under Grant No. F.No.36-246/2008 (SR) From Central University of Allahabad.