

Video Surveillance

Overview of the course:

Large-scale video networks are becoming increasingly important for a wide range of critical applications such as video surveillance, monitoring of disaster zones and traffic, elderly care, tracking people and vehicles in crowded environments, and providing more realistic images for consumer electronics and entertainment. In most of these applications, multiple sensors such as video cameras, infrared (IR) or range sensors gather data from various view points, which is then sent to a central processing unit. There is no intelligent processing of the data locally at each camera, and the monitoring stations, staffed with humans, generally store and observe multiple video streams with very limited automatic processing. Many fundamental problems need to be solved before these networks can be used effectively.

The development of automated techniques for aggregating and interpreting information from multiple video streams in large-scale networks in real-life scenarios is very challenging. Research in video sensor networks is highly interdisciplinary and requires expertise from a variety of fields. Examples include sensor networks, video analysis, cooperative control, communications, sensor design, and graphics. However, these disciplines have their own core sets of problems, and it is not easy for researchers to focus on problems that require advanced knowledge from multiple areas. This interdisciplinary workshop will bring together leading researchers from these different areas for an in-depth discussion on the future challenges and research directions in camera networks.

Modules	This course consists of one module only. 30th July to 3rd Aug 2018
You Should Attend If You are	<ul style="list-style-type: none">▪ Students of B.Tech, M.Tech, Ph.D. research scholars and faculty members of academic institutions and technical institutions.▪ Executives, engineers and researchers from utilities, services and government organizations, including R&D laboratories.
Registration Fees	<p>The participation fees for attending the course is as follows: Overseas Participants: US\$ 200 Industry/ Research Organizations: Rs. 3000 Participants from Academic Institutions: Rs. 1000 (Rs. 500 for SC/ST participants) Research Scholars/Students/Alumni: Rs. 500 (Rs. 250 for SC/ST participants)</p> <p>After registration on GIAN portal http://www.gian.iitkgp.ac.in/GREGN/index, the candidates are advised to submit the prescribed fee in the form of DD in favor of “Registrar, DTU” payable at Delhi along with printout of online submitted application form to Dr. Jeebananda Panda, Course Coordinator (GIAN), Department of Electronics and communication Engineering, Delhi Technological University, Bawana Road, Delhi-110042 on or before 16/07/2018. The shortlisted participants will be informed through e-mail.</p> <p>The above fee includes all instructional materials, computer use for tutorials and assignments and laboratory equipment usage charges. The course fee does not include boarding and lodging. The paid hostel/guest house accommodation may be provided on first come first serve basis with prior request.</p>

Teaching Faculty



Dr. Bir Bhanu is the Bourns Presidential Chair, Distinguished Professor of Electrical and Computer Engineering and Cooperative Professor of Computer Science and Engineering, Mechanical Engineering and Bioengineering, Director of the Center for Research in Intelligent Systems (CRIS), and the Visualization and Intelligent Systems Laboratory (VISLab) at the University of California, Riverside (UCR). In addition, Dr. Bhanu serves as the interim Chair of the Bioengineering Department at UCR. Dr. Bhanu also serves as the Director of NSF IGERT program on Video Bioinformatics.

Dr. Bhanu was the first Founding Faculty of the Bourns College of Engineering and the Founding Chair of Electrical Engineering at UCR (1991-94). Prior to joining UCR, Dr. Bhanu was Senior Honeywell Fellow at Honeywell Inc. Dr. Bhanu has been on the faculty of the Department of Computer Science, University of Utah, and has worked with Ford Aerospace & Communications Corporation, INRIA-France and IBM San Jose Research Laboratory. Dr. Bhanu has been the principal investigator of various programs from NSF, DARPA, NASA, AFOSR, ONR, ARO and other agencies and industries in the areas of object/target recognition, learning and vision, image/video understanding, image/video databases with applications in security, defense, intelligence, biological and medical imaging, biometrics, autonomous navigation and industrial machine vision.

Dr. Bhanu is the co-author of eleven books (seven authored and four edited): Video Bioinformatics - From Live Imaging to Knowledge (Springer, 2015), Human Recognition at a Distance in Video (Springer, 2010), Human Ear Recognition by Computer (Springer, 2008), Synthesis of Pattern Recognition Systems (Springer, 2005), Computational Algorithms for Fingerprint Recognition (2003), Genetic Learning for Adaptive Image Segmentation (Kluwer, 1994) and Qualitative Motion Understanding (Kluwer, 1992), Multibiometrics for Human Identification (Edited, Cambridge University Press, 2011), Distributed Video Sensor Networks (Edited, Springer, 2011), Computer Vision Beyond the Visible Spectrum (Edited, Springer, 2004), and Computational Learning for Adaptive Computer Vision (forthcoming, Springer). Dr. Bhanu has published over 500 reviewed papers, including over 145 journal papers and 44 book chapters. Dr. Bhanu has 18 US and International patents (plus 5 pending). Dr. Bhanu has been the associate editor/guest editor of many journals including IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Image Processing, IEEE Transactions on Robotics & Automation, IEEE Transactions on Systems Man & Cybernetics-B, IEEE Transactions on Information Forensics and Security, IEEE Computer, IEEE Sensors Journal, Pattern Recognition, Pattern Analysis and Applications, Journal of Mathematical Imaging and Vision, Autonomous Robots, Computer Vision and Image Understanding, International Journal of Machine Vision and Applications, and others. Dr. Bhanu has received many outstanding journal and conference paper awards with his students; several research excellence and outstanding contributions awards from the university and industries (Honeywell Inc., IBM), including an award from the CEO of Honeywell Inc. Dr. Bhanu received an award for the team efforts in a large research program sponsored by DARPA. Dr. Bhanu received the Research Excellence Award from the Bourns College of Engineering at UCR in 2003. Dr. Bhanu received the 2011 Doctoral Dissertation Advisor/Mentor Award from the University of California at Riverside. Dr. Bhanu received the Pioneer Award of the Bourns College of Engineering at UCR in May 2015. Dr. Bhanu has been a consultant to DARPA, a panelist for the review of AFRL programs and a panelist for the strategic planning of ARO programs. Dr. Bhanu has been an expert witness in the areas of his interest. Dr. Bhanu has given many invited talks at conferences, universities, industries and DoD meetings. Dr. Bhanu is Fellow of the Institute of Electrical and Electronics Engineers (IEEE), the American Association for the Advancement of Science (AAAS), the International Association of Pattern Recognition (IAPR), the International Society for Optics and Photonics (SPIE), and the American Institute for Medical and Biological Engineering (AIMBE). Dr. Bhanu is a member of ACM and AAAI. Dr. Bhanu was the Chair for the DARPA Image Understanding Workshop, IUW (Monterey, CA, 1994), Chair for the IEEE Conference on Computer Vision and Pattern Recognition, CVPR (San Francisco, CA, 1996), Chair for the IEEE International Conference on Advanced Video and Signal-based Surveillance, AVSS (Santa Fe, NM, 2008), ACM/IEEE Conference on Distributed /Smart Cameras, ICSDC (Palm Springs, CA, 2013), and the founding Chair for the IEEE Workshop on Applications of Computer Vision, WACV (Palm Springs, CA, 1992, 2000). Dr. Bhanu is the General Chair of IEEE Conference on Winter Applications of Computer Vision (Hawai'i, HI, 2015). Dr. Bhanu served on the IEEE Fellow Committee (2010-2012). Dr. Bhanu continues to be very active in multiple professional conferences and workshops in the areas of his interest.

Course Coordinator(s)

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For Registration:

<http://www.gian.iitkgp.ac.in/GREGN/index>

Dr. Bhanu received the S.M. and E.E. degrees in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology; the Ph.D. degree in Electrical Engineering from the Image Processing Institute, University of Southern California and the M.B.A. degree from the University of California, Irvine. He also received B.S. (with Honors) in Electronics Engineering from the Indian Institute of Technology, BHU, Varanasi, India and M.E. (with distinction) in Electronics Engineering from Birla Institute of Technology and Science, Pilani, India. Dr. Bhanu supervises Ph.D. students in Electrical Engineering, Computer Science and Engineering, Mechanical Engineering and Bioengineering.

Dr. Bhanu's current research interests are Computer Vision, Pattern Recognition and Data Mining, Machine Learning, Artificial Intelligence, Image Processing, Image and Video Database, Graphics and Visualization, Robotics, Human-Computer Interactions, Biological, Medical, Military and Intelligence applications.

Host Faculty



Prof. S. Indu is currently working as a Professor in Electronics and Communication Engineering Department of Delhi Technological University. She did her graduation and post graduation in Electrical engineering from University of Kerala and PhD in Electronics and Communication Engineering from Delhi University. She has around 20 years of teaching experience. She has successfully completed 3 sponsored projects sponsored by Naval Research Board and DST. She has around 70 publications in Conferences and referred Journals. She has produced one PhD Student under her guidance. Her area of interests are wireless sensor network, computer vision and image processing

Host Faculty



Dr. Jeebananda Panda is currently working as an Associate Professor in Electronics and Communication Engineering, Delhi Technological University. He completed his Doctorate degree in Electronics and Communication Engineering from Delhi University. He has 30 publications in referred journals and conferences. His areas of interest are Image processing and water marking

Date and Timing of the Course: 30th July to 3rd Aug 2018**July 30:** Registration and Inauguration 9.00AM-11.00AM

Monday July 30	11.00 AM – 1.00 PM	Lecture 1:	Introduction to distributed sensing and computation
	2.30 PM – 4.30 PM	Tutorial 1:	Problem solving session on distributed sensing
Tuesday July 31	9.30 AM-11.00AM	Lecture 2:	Distributed Video Sensing and processing
	11.30AM- 1.00PM	Lecture 3:	Sensor Fusion and control
	2.30 PM- 4.30 PM	Tutorial 2:	Hands on experience in sensor fusion and control
Wednesday Aug 1	9.30 AM-11.00AM	Lecture 4:	Distributed Video Communications
	11.30AM- 1.00PM	Lecture 5:	Distributed Wireless sensor Networks
	2.30 PM- 4.30 PM	Tutorial 3:	Problem solving session on Distributed Wireless sensor Networks
Thursday Aug 2	9.30 AM-11.00AM	Lecture 6:	Distributed Video Understanding
	11.30AM- 1.00PM	Lecture 7:	Video Simulation/Graphics
	2.30 PM- 4.30 PM	Laboratory:	Hands on experience Video simulation
Friday Aug 3	9.30 AM-1.00PM	Lecture 8:	Educational Opportunities and Curriculum Development
	2.30 PM- 4.30 PM	Evaluation	Test and Certificate distribution to the participants