Multimodal and Advanced Biometrics Authentication
2nd – 11th January 2017

Malaviya National Institute of Technology Jaipur
Department of Computer Science and Engineering
Under
Global Initiative of Academic Networks (GIAN)
Ministry of Human Resource Development
Govt. of India

सत्यमेव जयते

About the Course

Automated human recognition in real environments is one of the most critical and stringent security. Biometrics authentication of individuals establishes identity of an unknown individual using their physiological or behavioral features. Unlike password or PIN, biometrics cannot be forgotten or lost and requires physical presence of the person to be authenticated. Unimodal biometric systems have to contend with a variety of problems such as noisy data, intra-class variations, restricted degrees of freedom, non-universality, spoof attacks, and unacceptable error rates. Several of these problems can be addressed by deploying multimodal biometric systems that combine two or more biometric modalities in order to cope up with the stringent performance requirements imposed for high security access. Recent advancements in the design of multimodal biometrics system concerns with information fusion, i.e. how the individual modalities should be combined to minimize errors and achieve high accuracy.

Systems based on fingerprints and eye features have, so far at least, achieved the best matching performance, the human hand also contains a wide variety of features that can be used by biometric systems. These features of the human hand are relatively stable and the hand image from which they are extracted can be acquired relatively easily. Furthermore, identification systems based on hand features are the most acceptable to users. The approaches to development of unimodal and multimodal biometric authentication system based on fingerprints and iris will be described in the proposed course.Govt. of India approved a new program titled

GIAN (An Initiative of Government of India)

Global Initiative of Academic Networks (GIAN) in Higher Education aimed at tapping the talent pool of scientists and entrepreneurs, internationally to encourage their engagement with the institutes of Higher Education in India so as to augment the country's existing academic resources, accelerate the pace of quality reform, and elevate India's scientific and technological capacity to global excellence.

GIAN is envisaged to achieve the following objectives:

a) Provide opportunity to our faculty to learn and share knowledge and teaching skills in cutting edge areas.
b) To provide opportunity to our students to seek knowledge and experience from reputed International faculty.
c) To create avenue for possible collaborative research with the international faculty
d) To increase participation and presence of international students in the academic Institutes.
e) Opportunity for the students of different Institutes/Universities to interact and learn subjects in niche areas through collaborative learning process.
f) Provide opportunity for the technical persons from Indian Industry to improve understandings and update their knowledge in relevant areas.

Dates	**2nd to 11th January 2017**
Location	Malaviya National Institute of Technology Jaipur, Rajasthan, India
Objective	The course is residential, spanning 10 days, and consists of lectures and hands-on experiences relating to diverse topics on Biometrics authentication. It is intended that the course will complement and extend the materials in existing technical courses that many students will encounter in their first year of postgraduate training. It will also provide an opportunity to broaden awareness of knowledge and techniques in Biometrics, Security, Pattern Recognition, Vision, and Image Computing, and to develop appropriate research skills.
Who should attend	Faculty, professionals and research scholars working in research areas like security, authentication and in promoting multimodal and advanced biometric authentication.
Format for the Course	**Logistics:** Number of days: 10 Number of Sessions: 30 Lectures and 10 Labs Format of Sessions: 20 hours Lectures, 10 hours Tutorials, 20 hours Labs

Contents	**Module 1: Introduction to Biometrics** • Existing Biometrics Technologies • Performance Evaluation and Comparison of Biometrics • Multimodal Biometric Authentication • Biometric Security **Module 2: Contact less and Contact-based Fingerprint Identification** • Fingerprint Sensors and Imaging, Feature Extraction, Template Generation • Matching Algorithms, Performance, Individuality of Fingerprints **Module 3: Iris Recognition** • NIR/Visible Iris Imaging, Segmentation, Enhancement • Feature Encoding Algorithms • Periocular Recognition, Matching and Classification **Module 4: Lab Sessions** • Lab Practice and Tutorials • Assignments (Questions and Discussion on Answers) • Mini project (Multimodal Biometric problem and its implementation) **Module 5: Markov chain Monte Carlo** • Uncertainty • Bayesian Networks • Approximate Inference in Bayes Nets Sampling Based Methods • Learning in Bayes Nets
Important Dates	**Registration opens:** August 17, 2016 **Registration closes:** December 31, 2016 **Accommodation Requests:** Before December 31, 2016
Registration Fee	**GIAN Portal registration** (Rs 500 fee is mandatory for all participants) Create login and password at http://www.gian.iitkgp.ac.in/GREGN/index Login and complete the Registration Form and select Course(s) Confirm application and pay Rs. 500/- (non-refundable) through online payment gateway. Download "pdf file" of the application form and email it to nnain.cse@mnit.ac.in. **MNIT Course Registration Fee (**exclusive of GIAN Portal Registration Fee) Rs. 5000.00 per delegate for participants from academic Institutes. Rs. 2500.00 for SC/ST delegate for participants from academic Institutes. Rs. 2000.00 for Research students. Rs. 1000.00 for SC/ST Research students. Rs. 10000.00 for Industry participants The registration fees for the foreign nationals is USD $250. The above fee includes all instructional materials, computer use for tutorials and lab, free Internet facility and Lunch and Tea. The participants will be provided with single bedded accommodation on payment basis.

Mode of payment	Participants are requested to send a Demand Draft in favor of **"REGISTRAR (SPONSORED RESEARCH) MNIT Jaipur"** payable at Jaipur with a print out of the filled in Registration form, by Courier/ Speed Post/ Registered Post before 20 July 2016 to: **Dr. Neeta Nain** Department of Computer Science and Engineering JLN Marg, MNIT Jaipur-302017 Rajasthan India Please label the envelop, `GIAN: Multimodal and Advanced Biometrics Authentication'. You may email a scanned copy of the DD and the signed registration form by the deadline to Dr. Neeta Nain at **nnain.cse[at]mnit.ac.in**
How to Reach Jaipur	Jaipur is well connected by Air, Road and Rail with all the major cities and railway stations in India. It is about 280 kms from New Delhi. It has direct flights from New Delhi (45 min), Mumbai (1.5 hrs) and Kolkata (2.2 hrs). The Institute is prominently located on JLN Marg and is 15 minutes from the Airport. It is 10 kms from the main Railway Station and Bus Stand. You easily find taxis and autos 24 hrs.
Local Accommodation	Accommodation at the Institute Guest houses will be available on payment on first come first served basis. The details regarding boarding and lodging are as follows: Rates: ***Guest House 1 (Limited capacity):*** Single occupancy, double-bedded a/c room): Rs. 750/- per day ***Guest House 2:*** (Single occupancy, double-bedded a/c room): Rs. 550/- per day ***Aurobindo Boys Hostel:*** (Single occupancy, double-bedded non a/c room): Rs. 100/- per day ***Gargi Girls Hostel:*** (Dormitory): Rs. 100/- per day There are many good fair price lodging facilities available nearby the campus.
Places to Visit	Jaipur is famous for its hospitality, culture, gems and jewelry, blue pottery, hand printed organic textiles and magnificent forts and palaces. Most prominent places to visit are Hawa Mahal, Jantar Mantar, City Palace, Albert Hall Museum, Amber Fort – Heritage Palace, Nahargarh fort, Jaigarh fort, Jal Mahal, Kanak Varindavan garden, Govind Dev Ji temple and many more. You may also visit Agra for a day on Sunday to visit one of the wonders Taj Mahal and Fetehpur Sikari. Agra is very well connected to Jaipur via Train, you may leave in the morning at 6:00 AM and can come back by 9:00 PM in the evening.

Brief Profile of Resource Person

Ajay Kumar is currently working in the Department of Computing, The Hong Kong Polytechnic University, Hong Kong, as an Associate Professor. He has been earlier working in the Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi, India, as an Assistant Professor (2005-08). He earned his Ph.D. Degree from The University of Hong Kong, in 2001. He holds several U.S. patents, and has authored extensively on biometrics and computer vision-based industrial inspection He was the program chair of the Third International Conference on Ethics and Policy of Biometrics and International Data Sharing in 2010 and CVPR 2016 Biometrics Workshop, the Program Co-Chair of the International Joint Conference on Biometrics held in Washington, DC, in 2011, the International Conference on Biometrics held in Madrid, in 2013, CVPR 2013-2015 Biometrics Workshops, He has been Member, Departmental Research Committee, IIT Delhi (2006-07). M. Tech Coordinator, IIT Delhi (2006-07). He was the Founder and Lab-in-Charge, Biometrics Research Laboratory, IIT Delhi.

Memberships and Positions Held:

- Vice President (Publications), IEEE Biometrics Council (2011-2012) (2013-2014)
- Editorial Board Member, IEEE Transactions on Information Forensics and Security (2010-2013)
- Editorial Board Member, Pattern Recognition Letters (since 2012)
- General Co-Chair for the Second International Joint Conference on Biometrics in 2014
- General Co-Chair for First International Conference on Identity, Security and Behavior Analysis in 2015
- Area Editor (Hand Biometrics), Encyclopedia of Biometrics, Springer, 2008
- Senior Member IEEE (2007-)

Mausam is an Associate Professor at the Dept. of Computer Science in IIT-Delhi and an affiliate faculty at the University of Washington. He got his undergraduate degree from IIT-Delhi in Computer Science in 2001 and completed his PhD. work titled Stochastic Planning with Concurrent, Durative Actions from the University of Washington in 2007.

Mausam's work focuses on large-scale information extraction and text summarization, AI & ML applications to crowdsourcing and education, automated planning under uncertainty, machine learning, and probabilistic reasoning.

Mausam will be talking about Markov chain Monte Carlo, which happens within the context of Bayesian Networks. The talks will be on the lines of Uncertainty, Bayesian Networks, Approximate Inference in Bayes Nets Sampling based methods and Learning in Bayes Nets.

Coordinators

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REGISTRATION FORM

Name (In Block Letters): _____

Designation: _____

Qualification: _____

Institution: _____

Address: _____

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Email address: _____

Mobile No: _____

Payment by DD in favor of "Registrar, MNIT Jaipur" payable at Jaipur.

Details of Demand Draft:

DD No: _____

Bank: _____

Amount Rs: _____

Date: _____ **Place:** _____

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Signature of the Candidate