"Changes call for innovation, and innovation leads to progress"

Er. Pankaj Bagga

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Objectives

Seeking an Opportunity to utilize my skills and abilities in the Research and Development that offers Security and Professional growth while being resourceful, Innovative and flexible.

Education

Sept 2015 – June 2016 | Specialization in Computer Vision and Robotics

Majors in: Computer Aided Design, Robotics Engineering , Electronics Engineering , Signal Processing , Image Processing , Pythan , OpenCV , Robot Operating System (ROS)
CGPA: 14/20

Institution: Univrsité de Bourgogne, Le Creusot, France.

Sept 2008 – June 2012 | Bachelor in Electronics and Communication

Majors in: Calculus , Electronics Devices and Circuit, Digital Electronics, Signal System and Transform , Function of Complex Variable and Transform , Electromagnetics, Microelectronics Circuit analysis and Design , Communication Systems , Antenna and Radar Engineering, Microwave Engineering, Analog and Digital VLSI Design , Microprocessor and Its Applications , Microcontroller based Design, Control Engineering , Computer Networks.

CGPA: 8.34/10

Institution: Lovely Professional University, Jalandhar, India.

May 2006 – April 2008 | 10+2 Non-Medical

Majors in: Physics, Chemistry and Mathematics

Institution: Border Security Force School, Jalandhar Cantt, India.

Work Experience

17 May 2016 – Till Now | Managing Director

Panoramea | www.panoramea.fr

- Manage business tie-ups for Virtual tour
- Manage International team for virtual tour marketing.

April 2013 – Till Now | Member

Botkidz | www.botkidz.org

- Conduct Robotics classes for kids
- Provide Realtime demonstration of robots to kids
- Teach programming to kids through latest tools.

7 April 2013 – 30 August 2015 | Research Engineer cum CEO

E2MATRIX Research Lab | www.e2matrix.com

- Developing New Algorithms for Research and Development
- Handle Technical Queries of Research Scholars
- Test Efficiency of Softwares
- Working on Latest technologies
    - Conduct Seminar and Faculty Development Programs
    - Provide Training on MATLAB Tool

1 Febuary 2015 – 30 June 2015 | Managing Team

CADD Centre Frz | www.caddcentre.com

- Finalise all term and condition of Ferozepur branch.
- Decide final budget of franchise.
- Interaction with other technical staff of Cadd Centre

June 2014 – July 2015 | Research Expert (Freelancer)

TCP Research Solution | www.linkedin.com/in/harvinder-verma-6627444b

- Work as a Freelancer
- Developing New Algorithms for Research and Development
- Handle Technical Queries of Research Scholars through TeamViewer

6 November 2012 – 6 April 2013 | Manager Cum MATLAB Expert

Cetpa Infotech Pvt Ltd | www.cetpainfotech.com

- Mange all In-house trainings
- Kept record of all commercials
- Interact with University Higher Authorities (HODs , DODs)
- Handle Student General and Technical Queries
- Conduct Seminar and Faculty Development Programs
- Make Strategies to extract business from Market
- Provide MATLAB Training and Research Guidance to Masters and PhD Students.
- Handle other Staff Members Query

Sept 2012 – Nov 2014 | Freelancer

CS Technology | www.easiya.com/Amritsar/CS-Technologies-Amritsar-Ho-91479

- Work as a Freelancer
- Developing New Algorithms for Research and Development
- Handle Technical Queries of Research Scholars through TeamViewer

1 May 2012 – 5 November 2012 | Project Manager (RnD Domain)

Innovation rnds Pvt Ltd | www.innovationrnd.in

- Interact with Other Companies
- Create Project Design and Execute It
- Handle Technical counselling
- Make Plans for the growth of the company
- Market Research in finding new Innovative Products
- Provide MATLAB Training and Research Guidance to Masters and PhD Students.

1 June 2012 – 31 July 2012 | MATLAB Technical Expert

Cetpa Infotech Pvt Ltd | www.cetpainfotech.com

- Handle 4 Weeks MATLAB Training Classes
- Handle different Toolboxes and Tech them like- MATLAB Basics , Image Processing , Image Acquisition, Control System, Speech Processing and Simulink Basics.
- Tech Interfacing of MATLAB with other Softwares and Hardwares.

27 Jamuary 2012 – 21 April 2012 | Teaching Experience

Lovely Professional University | www.lpu.in

- Conduct TechnoHobby Classes for Students
- Handle different Toolboxes and Tech them like- MATLAB Basics , Image Processing , Image Acquisition, Control System, Speech Processing and Simulink Basics.
- Tech Interfacing of MATLAB with other Softwares and Hardwares.

June 2012 – October 2014 | MATLAB Expert (Guest Lecture) **Advetech** | http://advetech.in/

- Give Sessional Seminar and Workshop to Students in tie-up with Advetech.
- Work as Guest Lecture for different Colleges and Universities in tie-up with Advetech.

Internship and Training

1 July 2011 – 20 December 2011 | IN/VAS Engineer **IDEA**

Telecom | www.ideacellular.com

- Worked under Intelligent Networking and Value Added Service Department.
- Worked On Online Charging System.
- Create New Recharge Coupons from Server for Customers.
- Activate Mobile Number from Server for New Customers
- Handle Technical Complaints against GPRS System and Solve it
- Handle Inoamer and Outroamer System
- Control Customer Traffic on Congestion or Festival days

10 June 2011 – 20 December 2011 | Trainee **RAD**

Robotics | www.radrobotics.com

- Learn Image Processing using MATLAB under 4 weeks Training.
- Worked On New Technology Called Gesture Recognition using Image Processing
  - Interface MATLAB with 8051 Controller and other Hardware Devices
  - Work on Graphical User Interface using MATLAB.

• Worked on different Projects related to Image Processing Worked on Indian Railway System with my Mentor.
• Learned Interfacing of different software for developing final result.

4 June 2009 – 28 October 2009 | Trainee

SRS Infotech | http://punjabbest.com/view/1762/SRS-INFOTECH.html

• Study Computer Hardware and Software.
• Learn Basics of Operating System .
• Learn about Networking Basics – LAN , Printer or Router

1 April 2008 – 15 June 2008 | Trainee **NIDS** |
http://www.nidsadampur.elisting.in/

• Learn Basics of Computer System.
• Learn Basics of C Programming.

Guest Lecture and Seminar Delivered

7 Nov 2012 – 9 Nov 2012 | 2 Days Seminar on Image Processing
IICPT (Indian Institute of Crop Processing Technology) | www.iicpt.edu.in

• Teaching Basic of MATLAB and Algorithm development to Researchers.
• Illustrate the Use of MATLAB in Research Field.
• Teaching Basics of Image Processing.
• Teaching Basics of Signal Processing and Pattern Matching
• Teaching Real-time Interfacing of Hardware Camera with MATLAB for Crop Processing
• Discuss the use of Statistical Analysis in Research Work

11 Sept 2012 – 14 Sept 2012 | 3 Days on Bio-Medical Image Processing **Sri Ramakrishna Engineering College**| http://srec.ac.in/

• Teaching Basic of MATLAB.
• Teaching Basics of Image Processing.
• Teaching Basics of Bio-Medical Image Processing
• Illustrate the Real-time Applications of X-Ray, MRI, ECG, EMG Signal on MATLAB

15 Sept 2012 | Guest Lecture on Image and Video Processing

Shaheed Bhagat Singh State Technical Campus | http://www.sbsstc.ac.in/

- Discuss about Image Processing System
- Discuss Researchers doubts on Image and Video Processing
- Show Running Applications of Image and Video Processing

15 Sept 2012 | Guest Lecture on Computer Vision Applications

CT University | http://www.ctgroup.in/

- Discuss use of different tools for Computer Vision.
- Give Brief detail about MATLAB and Image Processing.
- Illustrate the some sample code for Computer Networks and Camera Acquisition and use it with standard Algorithms using MATLAB

Language Skills

Punjabi	: Mother Tongue	**English**	: Proficient
Hindi	: Proficient	**French**	:Beginner
Italian	: Beginner		

Honors and Achievement

- Obtain Btech. Electronics and Communication degree in 2012 with Honors
- Having highest TGP record of 9.61/10 During 4th Semester
- Having A grade in General Presentation Skills
- Start Research Company with less than 2 Employees and take it into more than 10 Employee (Part time and Full time Both)
- Worked on Indian Railway Project for Load Cell Testing Project.

Skills and Interests

TECHNOLOGY KNOWN : Image Processing ,Signal Processing , Communication System , Electrical System , Wireless Sensor Networks, Mobile Ad-hoc Network , Cloud Computing, Parallel Computing, Data Mining , VLSI, Neural Network , Software Testing , Robotics

TOOLS KNOWN : MATLAB , NS2 , TANNER , OPNET , ROS , ROBOREALM

LANGUAGES KNOWN : C , EMBEDDED C, OPENCV , OPENCL , CUDA , VERILOG, MATLAB , PYTHAN

NEW TECHNOLOGIES : VTS 3rd Generation, DI GUY human simulation tool, Virtual Reality, Gesture Technology.

READING SKILLS : Biographies, Autobiographies and Inspirational novels

UNIQUE SKILLS : Searching about Facts of Technology .

- History Behind C (Speed of Light) . I Perform experiment Practically with Mirrors and Laser for my personal study .
- Effect of Electronics on future Vehicles , I study a complete system which tell that how cars will communicate with each other in coming future with the help of Electronics.

Research Projects Completed

Kindly refer the below link for more detail regarding projects -

Site - www.pankajbagga.com/portfolio

Medical Imaging and Biometric Projects –

1. **3-Level Medical Image watermarking system using DWT:**

In this Project I am use different techniques to Enhance the quality of Medical Images. For Eg – Stretched Image Histogram , Image Interpolation , Contrast and Intensity Adjustment , Histogram Equalization based upon Mean and Standard Deviation, Inverse Transformation , Logarithmic Transformation , Power Transformation and Gray Level Slicing . In each Case I am get different type of Results.

2. **MASS DETECTION OF BREAST CANCER USING MAMMOGRAMS**

In this project, an algorithm is proposed for mass segmentation and Classifying the malignant and benign mass on the basis of shapes of mass.

3. **An information fusion based method for liver classification using texture analysis of ultrasound images**

In this Project, I am develop a system for Ultrasound Images using Fuzzy Logic and

Neural Network. First I was apply LBP for Extract feature of the Ultrasound Image. After that apply Fuzzy logic to Categories the features and Finally I Apply Neural Network for Classification.

4. EARLY BRAIN CANCER DETECTION IN MRI

Cancer is a genetic and vital disease. In last decade, many important genes responsible for the genesis of various cancers have been discovered, their mutations precisely identified, and the pathways through which they act are been characterized. Mammography is the most common technique used by radiologists in the screening and diagnosis of the cancer cells. This project work presents an extension in computer aided diagnosis for early prediction of cancer cells in brain using Texture features and neuro classification logic. The project extracts the texture from the given brain MRI sample using discrete wavelet transform and morphological operation followed by neuro classification for prediction of Cancer for a given sample. The task works on the extraction of five distinct features with calculation of minimum distance for the prediction of brain cancer. This project work is to be implemented on matlab environment with biological toolbox support for the implementation and verification of proposed system.

5. Fingerprint Authentication and Classification Using Sparse Representation and Neural Networks

Fingerprint authentication and classification are introduced after compressed images. Sparse representation is used for compression process. In this algorithm, construct a dictionary for predefined fingerprint image patches. For a new given fingerprint images, represent its patches according to the dictionary by computing l0minimization and then quantize and encode the representation. It provide high Peak Signal to Noise Ratio and high compression ratio. Experiments also illustrates that the algorithm is robust to extract minutiae. Before compression, preprocessing steps are done for future work. The proposed method is fingerprint compressed images are authenticated and classified using neural networks. After that compressed images two finger combination based new finger print create for high secure privacy protection. A novel system for protecting fingerprint privacy by combining two different fingerprints into a new identity for authentication. And also to classify the training samples should include fingerprints with different quality (“good”, “bad”, “ugly”).

6. Sclera vein recognition System for Authentication Check

Sclera vein recognition is shown to be a promising method for human identification. However, its matching speed is slow, which could impact its application for real-time applications. To improve the matching efficiency, we proposed a new parallel sclera vein recognition method using a two-stage parallel approach for registration

and matching. First, we designed a rotation- and scale-invariant Y shape descriptor based feature extraction method to efficiently eliminate most unlikely matches. Second, we developed a weighted polar line sclera descriptor Third, we designed a coarse-to-fine two-stage matching method. Finally, we developed an efficient approach for sclera vein recognition with high accuracy. The experimental results show that our proposed method can achieve dramatic processing speed improvement without compromising the recognition accuracy.

7. A New Chaotic Algorithm for Image Encryption and Decryption of Digital Color Images

In this project, a new image encryption scheme which employs one of the three dynamic chaotic systems (Lorenz or Chen or LU chaotic system selected based on 16byte key) to shuffle the position of the image pixels (pixel position permutation) and uses another one of the same three chaotic maps to confuse the relationship between the cipher image and the plain-image (pixel value diffusion), thereby significantly increasing the resistance to attacks.

8. Wavelet-based Feature Extraction Algorithm for an Iris Recognition

The proposed algorithm aims to find out the most efficient wavelet family and its coefficients for encoding the iris template of the experiment samples. The algorithm implemented in software performs segmentation, normalization, feature encoding, data storage, and matching. By using the Haar and Biorthogonal wavelet families at various levels feature encoding is performed by decomposing the normalized iris image. The vertical coefficient is encoded into the iris template and is stored in the database. The performance of the system is evaluated by using the number of degrees of freedom, False Reject Rate (FRR), False Accept Rate (FAR), and Equal Error Rate (EER) and the metrics show that the proposed algorithm can be employed for an iris recognition system.

Image Processing Projects –

1. Lie Detection using facial expression by using neural networks

Lie Detection using Facial recognition systems usually consist of four steps, as shown in Figure; facial detection (localization), facial preprocessing (facial alignment/normalization, light correction and etc), feature extraction and feature matching.

2. Hindi characters and numerals recognition using neural network

In this project, design and implementation of character recognition techniques based on neural network. Designing a Hybrid System for both Hindi character and modifier for detection.

3. **Handwritten text recognition using fuzzy** In this Project I am try to Recognize Handwritten Text using Fuzzy Logic Technique and show result in Notepad

4. **Face Recognition using ACO (Ant Colony Optimisation)**

In this Project, I am design a technique to perform face matching by comparing min Eigen distance but before matching feature should be Optimized using ACO Algorithm.

5. **Face Recognition using SURF, SIFT and PCA techniques**

In this Project , I am develop a technique for face recognition using a hybrid system of SURF , SIFT and PCA techniques.

6. **Digital Image Watermarking in DCT Domain Using Fuzzy Inference**

In this project, three essential characteristics of the HVS model namely – luminance sensitivity, edge sensitivity computed using block threshold and contrast sensitivity computed using block variance are employed to obtain the output (weighting factor) of Fuzzy Inference System (FIS). The weighting factor is used to robustly embed a randomly generated watermark normalized as per N(0, 1) with mean 0 and variance 1 in the low frequency DCT coefficients of a given host image according to a prespecified formula. The watermarked image has good perceptible quality and the computed values of MSE and PSNR indicate a robust embedding process.

7. **An Efficient Optimization Technique for Hiding Information in Image**

In this project, I have designed and implemented AES (Advanced Encryption Standard) that is hybridized with genetic algorithm to get higher PSNR and data hiding capacity

8. **Real-Time Single and Multiple Object Tracking using Laptop Camera**

In this Project, I am trying to develop a software that Track the mark Object. For this I am Calculate Surf Features and Estimate Geometric Transform to match Features of Mark and Camera Image

9. **A High Payload Video Steganography Algorithm in DWT Domain based on BCH codes**

Video Steganography is a technique to hide any kind of files into a carrying Video file. The use of the video based Steganography can be more eligible than other multimedia files, because of its size and memory requirements. The least significant bit (LSB) insertion is an important approach for embedding information in a carrier file. Least significant bit (LSB)insertion technique operates on LSB bit of the media file to hide the information bit. Although Bitmap files are perfect for steganography

use, they are able to carry only small files. So there is a problem, how to get much enough files to hide our message, and what to do to read them in a correct order? Good way out is to hide information in a video file, because as we know, AVI files are created out of bitmaps, combined into one piece, which are played in correct order and with appropriate time gap. If we'll use algorithm for hiding data in digital pictures, we can hide our message in bitmap obtained in this way, and then save it into new AVI file.

10. **Watermarking encryption using DCT**

In this project, I am create a GUI(Graphical User Interface) to Perform Watermarking Using DCT . First of All I am Input Cover Image and Message . Apply Discrete Cosine Transform to Embedded Message in the Image and Calculate the PSNR and MSE Value After this Perform Inverse Approach to Extract the Message that we Hide in Image. Finally Studies the After of Watermarking according to different Size of Images using
PSNR and MSE.

Signal Processing Projects –

1. Develop a System to Analyze ECG using Empirical mode decomposition:

In this Project, I am proposed a System a Detect Beat Rate In ECG Signal using Hybrid Approach that contain High Pass Filter, Empirical Mode Decomposition Method and Convolution Filters.

2. Punjabi speech recognition using wavelet transform

In this project, Punjabi speech recognition is done using wavelet transform 1- HAAR 2- COIFLET 3- DAUBECHIES

3. Speech Recognition Using Mel Frequency Cepstrum Coefficients of a System (MFCC)

In this Project I am write a code in Matlab to perform Speech Recognition. Firstly I record all Speech files in Wave Format and its Training, In Training I am assign Codebook for each Speaker and Computer MFCC function. After that I am perform test with New Sample of wave file and perform same steps like , Assigning codebook to new Speaker and compute MFCC function again. Finally at the end for matching I am calculate the Distortion between the Training Dataset and Testing Wave file of Speaker.

4. PERFORMANCE COMPARISON OF DENOISING MEHODS OF ELECTROENCEPHALOGRAPH

In this Study of function and characteristics of IIR, FIR and DWT algorithms is

done.Then by Applying FIR filter, IIR filter, wavelet Transform on EEG signal in MATLAB using DSP tool to remove the artifacts. Comparing the results of applied algorithms by calculating SNR values and find the best from these applied algorithms for denoise the raw EEG signal.

Projects Topics Based Optimization and Fuzzy Logic –

1. Optimisation of Dejong function using Mendel and Genetic Algorithm

In this Project , I am proposed a system to Optimised the Dejong Function using Mendel and Genetic Algorithm .

2. Wireless Sensor Network using GA(Genetic Algorithm) and GSA (Gravitional Search Algorithm) for Energy Optimization

In this Project , I am design a protocol using GA-GSA hybrid technique so that the Energy Consumption by the Wireless sensor Network should be Optimized.

3. Design a Beenish Protocol for Wireless Sensor Network

In this Project , I am design a Protocol name Beenish. This protocol is used in Wireless Sensor Network and Manet Network to control the Energy efficiency of a Network .

4. Energy Diminishing with Clustering Scheme using Fuzzy Abiding Cluster Formation Protocol in Wireless Sensor Network

In this project, cluster head in the network is chosen by fuzzy inference system and network lifetime is increased.

5. Performance Analysis of multihop transmission systems employing amplify-and-forward relays over different fading environments

In this project, I have analyzed the performance of multihop transmission systems that employ amplify-and-forward relays over five different fading environments in the presence of a Poisson field of interferers.

6. Fuzzy Logic Based Control of Variable Speed Induction Machine Wind Generation System

In this project, I have develop and analyze a Simulink model of wind farm for multiple generator without any optimization technique And then implemented Fuzzy logic control system in the multiple wind generator system.

References

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Rajiv Sobti Professor Dean of Department Computer Science LPU (Lovely Professional University), Jalandhar-Delhi, G.T. Road (NH-1), Phagwara, Punjab (INDIA) -144411. Tél : +91 18 24 40 44 04 Fax : +91-1824-506111 (General) Email : rajiv.sobti@lpu.co.in Web : http://www.lpu.co.in	**Bhupinder Verma** Professor Dean of Department Electronics and communication LPU (Lovely Professional University), Jalandhar-Delhi, G.T. Road (NH-1), Phagwara, Punjab (INDIA) -144411. Tél : +91 98 76 01 51 10 Fax : +91 18 24 50 61 11 (General) Email : vikasdeep.11200@lpu.co.in Web : http://www.lpu.co.in
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