MIRZA WAQAR BAIG

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OBJECTIVE

Become a good researcher in my field.

EDUCATION

Electronics Engineering, Doctor of Philosophy (PhD)
March 2012 – To date

University of Genoa, Genoa, Italy (http://www.unige.it/)
Eindhoven University of Technology, Netherlands (http://www.tue.nl/en/)
Erasmus Mundus Joint Doctorate (EMJD) Fellow

Learning and recognition of emotion patterns from automatic analysis of cognitive entities interactions.

Electronics Engineering, Master of Science
September 2009 – August 2011

Hanyang University, Ansan, South Korea (www.hanyang.ac.kr/english)
CGPA 3.63/4.0

Studies focused in computer vision, image processing, machine learning and 3D image processing. Created working models for real time detection, matching and recognition applications.

Electrical Engineering, Bachelor of Science
January 2003 – June 2007

Bahauddin Zakariya University, Multan, Pakistan (www.bzu.edu.pk)
Obtained Percentage 78.5 %

Specialized in communication and electronics. Actively participated in team projects to create real-world applications. Served as Teaching Assistant for introductory logic design, responsible for assignment grading, class review sessions, and one-on-one student meetings.

Pre- Engineering , Higher Secondary School
September 2000 – August 2002

Government College, Multan, Pakistan
Obtained Percentage 78.0 %

Studies focused in engineering subjects such as Mathematics, Algebra, Physics and Chemistry. Learned basic concepts and applied these concepts to practical issues.

PROJECTS

Vehicle Detection using Gabor Features

My Master degree thesis is on Vehicle detection by using Gabor features in real time video. The possible locations of vehicles in the image sequence are hypothesized using the cross correlation with template images. The hypothesized vehicle locations in image sequence are verified by using Gabor features and using SVM (Support Vector Machine) as classifier. The detection accuracy is

Skills

C/C++
Assembly Language (x86 architecture)
Verilog Hdl
Ladder Language (PLC)

Matlab R2010a
Multisim
OpenCV
OpenGL

more than 90 percent for day light image sequences and it is robust to illumination and noise in the video. The research paper of this work has been accepted in ICHIT' 2011 (Int'l Conference on Convergence and Hybrid Information Technology). The proceedings have been published by LNCS as SCI-E.

Optimization of SIFT algorithm

During my master degree, I worked on SIFT (Scale Invariant Feature Transform) algorithm optimization for better matching in real time. Using adaptive threshold method for keypoint selection to increase the number of valid keypoints and this improves the matching and removes the keypoints selected due to bad illumination. The work of this project has been presented in IEEE MWSCAS'2011 conference (Midwest Symposium on Circuits and Systems).

Real time lane and vehicle detection using a single camera

During my Master degree, I worked on the detection of lane and vehicles using a single camera. Lane was detected using a generalized Hough transform and vehicles were detected using adaptive thresholding in edges and using SVM (Support Vector Machine) to verify them. Lane detection has success rate more than 90 percent and vehicle detection results are better than related state of art techniques. This was a company project named as ETRI (Electronics and Telecommunications Research Institute), Korea. The lane detection paper was published in KIEE ICS'2010 (Information & Control Symposium).

3D depth map denoising

During my Master degree, I worked on 3D depth map denoising in depth maps obtained by TOF (Time Of Flight) SR3000 camera. Using intensity map from a high resolution 2D camera and noise aware bilateral filter and adaptive thresholding, reduced noise in the depth maps by enhancing its depth edges and suppressing texture in depth maps. The depth map was up- sampled and results showed a clear reduction in noise. This was a project from Samsung Electronics, Korea. This work was published in IEEE ISOCC '2010 (International System on Chip Design Conference).

HDR Imaging

During my Master degree, I worked on LDR (Low Dynamic Range) images to make them HDR (High Dynamic Range) images. Using a block based tone-mapping approach and bilateral filter to improve the HDR quality. The results are better than benchmark methods and have computation time less than any of these methods. The transaction regarding this work is under review in IEEE Image Processing transactions.

Implementation of PLC on UREA Bag Filling Machine

During my undergraduate degree, I got implemented PLC (Programmable Logic Controllers) on a conventional relay based UREA Bag Filling Machine operative in Fauji Fertilizers Company (F.F.C.) Pvt. Ltd., Pakistan.

OFDM Modem for WLANs and Wimax on FPGAs

I studied the IEEE 802.11a & 802.16 PHY standards for WLANs, WIMAX and OFDM technique for its implementation. I simulated the complete Baseband Model of this Modem on MATLAB and also implemented the transmitter side for Xilinx FPGA. It was my BE final year project. (Worked as Team Leader).

Publications

1. New Single Camera Vehicle Detection Based on Gabor Features for Real Time Operation (SCI-E), Mirza Waqar Baig, Jahanzeb Hussain Pirzada, EhsanulHaq and Hyunchul Shin,

Proceedings of International Conference on Convergence and Hybrid Technology, September 23-25, Daejon, South Korea. http://www.springerlink.com/content/9186k846745322x6/

2. A New Adaptive Threshold Technique for Improved Matching in SIFT, Jahanzeb Hussian Pirzada, Mirza Waqar Baig, EhsanulHaq and Hyunchul Shin, IEEE International Midwest Symposium on Circuits and Systems, August 07-10, 2011, Seoul, Korea. http://dx.doi.org/10.1109/MWSCAS.2011.6026528
3. New Hand Gesture Recognition Method for Mouse Operations, EhsanulHaq, Jahanzeb Hussian Pirzada, Mirza Waqar Baig, and Hyunchul Shin, IEEE International Midwest Symposium on Circuits and Systems, August 07-10, 2011, Seoul, Korea. http://dx.doi.org/10.1109/MWSCAS.2011.6026330
4. Adaptive Bilateral Filtering for Noise Removal in Depth Upsampling, Donghoon Yeo, EhsanulHaq, Jongdae Kim, Mirza Waqar Baig and Hyunchul Kim, IEEE İnternational SoC Design Conference Incheon, South Korea, November 22-23, 2010. http://dx.doi.org/10.1109/SOCDC.2010.5682980
5. Lane Detection and Detection-Error Correction by using Hough Transform, JaegwonSeo, Sungchul Jung, Mirza Waqar Baig and Hyunchul Shin, Proceedings of 2010 Information and Control Symposium, Yongin, South Korea, April 23-24,2010.

PROFESSIONAL EXPERIENCE

Graduate Research Assistant
September 2009 – June 2011

Digital Systems Lab, Hanyang University, South Korea

Worked in Image Processing and Computer Vision research group. Worked on several image processing and computer vision projects mainly on algorithms for detection and recognition. Worked on optimization of SIFT algorithm, Gabor features for texture classification, Bag of features approach for part based vehicles detection and haar like features for gesture recognition.

Automation Engineer, Summer Internship
June 2007 – August 2007

Fauji Fertilizers Company (F.F.C.) Limited, Pakistan.

Worked on Power Plant of FFC, Understood the generation, transmission and distribution of electrical energy. Understood the systems of motor control centers, auxiliary control panels and protection relays. Worked on installation of Siprotec Relays in Motor Control Centers. Understood the PLC installed in UREA Handling Plant and DCS.

ASIC Design Engineer, Summer Internship
June 2006 – August 2006

PalmChip Pakistan (Pvt.) Ltd, Islamabad, Pakistan

Worked as ASIC Design Engineer, worked on logic design, ASIC design flow & verification, FPGA designing, also worked on GCC & GTK to develop GUI in Linux environment.www.palmchip.com

HONORS & ACHIEVEMENTS

Awarded merit scholarship for study in M.Sc. Electronics Engineering in Hanyang University, South Korea.
Awarded Fauji Fertilizer Co. Ltd., Pakistan Merit Scholarship in B.Sc. Electrical Engineering.