Rania Hassen

Curriculum Vitae

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Education

2007 – 2013 **PhD – Electrical and Computer Engineering**,
University of Waterloo, Waterloo, Canada.
Supervisors: Zhou Wang, Magdy Salama

Thesis Title *Local Phase Coherence Measurment for Image Analysis and Processing*

2000 – 2006 **MASc – Electrical and Computer Engineering**,
Assiut University, Assiut, Egypt.
Supervisors: Youssf Mahdy, Khaled Shabaan

Thesis Title *Written Arabic Text to 3D Arabic Sign Language based on Animation Techniques for Web Application*

1995 – 2000 **BASc – Electrical Engineering**,
Assiut University, Assiut, Egypt.
Supervisor: Khaled Shabaan

Thesis Title *Communication Network on Power Line*

Research Experience

May'07 – Present **Research Student Assistant**, *PAIM research group*,
Department of Electrical and Computer Engineering, University of Waterloo.

Description Investigate theoretical extensions of local phase coherence theory.
Design a new no-reference sharpness index for assisting the quality of blurred images.
Develop a fusion algorithm to enhance the perception of images taken under limited depth-of-focus and poor lighting conditions.
Introduce a new technique to register medical images with few common structure.

Jan'07 – May'07 **Research Project Manager**, *MIAMI research group*,
Department of Electrical and Computer Engineering, University of Waterloo, *in corporation with Medtrode Inc., London, Canada..*

Description *Title: Deep Brain Stimulator*
The project aims to develop telemedicine tool for Narcolepsy patients treated by implanted brain electrodes. I have developed a web service for transmitting electrical pulses to remotly correct electrodes settings through a friendly designed user interface program in both physician abd patient sides. ASP.Net and C++ Client-Server platform have been used for implementation task.

Spt'00 – Mar'06 **Research Student Assistant**, *Department of Computer Science*,
Faculty of Computers and Information, Assiut University, Assiut, Egypt.

Description *Title: Arabic Speech to Signs (ASS)*
Worked in cooperation with Elementary Public School for Deaf - AlAmal to develop an easy graphical avatar which convert Arabic text to animated ASL (Arabic Sign Language) for deaf and dump school age students. The project is a part of national funded project to develop a full animated speech-to-sign tool. Most of the work have been done using Java and VRML graphics tool.

Feb'00 – Jul'00 **Research Student Assistant**, *Department of Computer Engineering*,
Faculty of Engineering, Assiut University, Assiut, Egypt.

Description *Title: Network on power-line*
The idea was to develop hardware electronic circuit connected to PC serial port in both sender and receiver sides. The electronic circuit should be able to encode the serial port signal and send it over the power cable to the receiver side which decodes received signal. Multithreaded software has been designed to continuously check for received and sent messages. Encryption using Morse Code has been uemployed to ensure messages secuity. A chat program has been used as a simple application to evaluate hardware and software performance. Implemented using C++.

Industry Experience

May'13 – Now **Technical Lead Software Developer**, *R&D Clinical Specialty Department*,
Merge Healthcare, Toronto, Canada.

Description Design and development of the most commonly used CAD system in North America CADstream^{TM}used by GE and many other MR vendors. CADstream^{TM}is proven CAD for MRI, improving quality, standardization and efficiency of study analysis and reporting. Research into finding most effecit and optimized image analysis methodoligies for early detection of prostate cancer and assessment of cancer aggressiveness.

Sept'11 – August'12 **Software Developer**, *R&D Clinical Specialty Department*,
Merge Healthcare, Toronto, Canada.

Description Designed and implemented solution for X-Ray image enhancement.
Was part of the developing team for CADstream^{TM}used by GE breast, liver and abdominal MRI scanners.
Designed and implemented the groundwork of two research projects, the first project aims for measuring cumulative exposure dose of patients in routine clinical examination. The second project targeted the implementation of new breast bio-marker as an early measure of breast cancer for high risk cohort, the bio-marker measure the ratio of breast parenchyma with respect to breast fat.
Trained in using document control and issue tracking web-based tool.

Teaching Experience

Jan'09– Dec'10 **Lab Instructor**, *Dept. of Electrical and Computer Engineering*,
University of Waterloo (UW), Waterloo, Canada.

Courses Taught Digital Computers - Assembly Language Programming, Fall Term 2010.

Jan'08– Dec'08 **Teaching Assistant**, *Dept. of Electrical and Computer Engineering*,
University of Waterloo (UW), Waterloo, Canada.

Courses Taught Fundamentals in Electrical Circuits - Winter 2008 , Digital Computers - Spring 2008 and Fall 2008

Feb'02 – Apr'06 **Assistant Lecturer**, *Department of Computer Science*,
Faculty of Computers and Information, Assiut University, Assiut, Egypt.

Courses Taught — Digital Design, Data Structure [C++], Electronic circuits, File Structure [C++], Electronic laboratory, Introduction to computers, Programming using C/C++, Algorithm Theory, Operating System, Assembly Language, Object Oriented Programming using Java.

Spt'00 – Jan'02 — **Assistant Lecturer**, *Department of Electrical Engineering*,
Faculty of Engineering, Assiut University, Assiut, Egypt.

Courses Taught — Electronic circuits I and II, Electronic laboratory, Digital design, Windows Programming using API, Microprocessor, Automatic Control.

Publications

Image Quality Assessment — *R.Hassen, Z.Wang, M.Salama, "Objective Quality Assessment for Multi-exposure Multi-focus Image Fusion"*, IEEE Transactions on Image Processing, 2015. (Accepted in press).

Image Quality Assessment — *R.Hassen, Z.Wang, M.Salama, "Image Sharpness Assessment Based on Local Phase Coherence"*, IEEE Transactions on Image Processing, vol.22, no.7, pp.2798-2810, July 2013.

Image Processing — *R.Hassen, Z.Wang, M.Salama, "A Flexible Framework for Local Phase Coherence Computation"*, International Conference of Image Analysis and Recognition, Burnaby, BC, Canada, June 22-24, 2011.

Image Quality Assessment — *R.Hassen,Z.Wang,M.Salama, "No-Reference Image Sharpness Assessment Based On Local Phase Coherence Measurement"*, IEEE International Conference on Acoustics, Speech, and Signal Processing, Dallas, Texas, U.S.A, March 15-19, 2010.

Medical Image Registartion — *R.Hassen, Z.Wang, M.Salama, "Multisensor Image Registration Based-on Local Phase Coherence"*, IEEE International Conference of Image Processing, Cairo, Egypt, November 7-11, 2009.

Image Fusion — *R.Hassen, Z.Wang, M.Salama, "Multifocus Image Fusion Using Local Phase Coherence Measurement"*, International Conference of Image Analysis and Recognition, Halifax, Canada, July 6-8, 2009.

Image Processing — *R.Hassen, F.Karray, S.Samir, M.Salama, "Impulse Noise Detection and Reduction in MRI Images using FIDRM Fuzzy Filter"*, IEEE KW-Section Joint Workshop on Multimedia Mining and Knowledge Discovery, University of Waterloo, Canada, 17-18 October, 2007.

Computer Animation — *R.Hassen, Y.Mahdy, K.Shaaban, "Web Tool for Synthesizing 3D Animation of Arabic Sign Language based on VRML-Java-EAI"*, Journal of Engineering Sciences, Vol. 33, No. 4, pp. 1581-1594, July 2005.

Technical Skills

Programming Languages

Object-Oriented — C/C++, C#, Java (J2SE and J2EE), Python(in my learning queue)

Low-Level — Assembley for both Intel™ and Motorola™ Processors

Script — VRML 2.0, Javescript, HTML, CSS

Design Tools

Scientific — MatLab™

IDE — Visual Studio (2005, 2008, 2010), Eclipse Java

Miscellaneous

Office Automation	LaTeX, Microsoft Office™
Operating Systems	All Microsoft™ operating systems, Linux Ubuntu
Framework	.NET (3.5, 4.0), Client-Server Architeture
Test Driven Development	NUnit

Technical Reports and Projects

- *Remote Programming Interface for the Neuromodulation System*, April 2007, Submitted to Medtrode Inc., London, Canada. (Technical Report).
- UWO Research Ethics Board submission based on the Clinical Protocol. VASCPROG 603: Research Ethics and Biostatistics. Course Project.
- *Texture Analysis for Tissue Characterization in Intravascular Ultrasound Images: A Review.* Image Processing and Visual Communication. Course Project
- *Unsupervised Texture Segmentation using Gabor-bank and Wavelet Transform Combined Features.* Image Processing and Visual Communication, Course Project.
- *Texture classification and segmentation using wavelet frames.* Analysis and Estimation of Signals and Images. Course Project.
- *Text Categorization Using SVM.* Data and Knowledge Modeling and Analysis. Course Project.
- *Support Vector Machines (SVMs): An Overview.* Intelligent Systems Design. Course Project.
- *Impulse Noise Detection and Reduction in Ultrasound Images using FIDRM Fuzzy Filter Intelligent Systems Design.* Artifical Intelligent Systems. Course Project.
- *Texture Segmentation using Gabor Filter.* Image Processing. Course Project.

Research Interests

- Medical Image Analysis
- Signal and Image Processing
- Information Theory
- Multimedia Communications
- Machine Learning

Awards/Distinctions

Graduate	Ontario Graduate Student Science and Technology (OGSST) (Fall 2010, Winter 2010
Graduate	Provost Doctoral Entrance Award for Women Engineering, (Fall 2008)
Graduate	Faculty of Engineering (FoE) Award for Excellence in Research and Course work, University of Waterloo, Canada (Fall 2008, Winter 2008, Fall 2009, Winter 2009)
Undergraduate	*Distinction* – Bachelor of Engineering – Egyptian Engineering Syndicate.
Undergraduate	Excellent Honor Award for Academic for outstanding marks (Sept 1995 – July 200).
Undergraduate	National Excellent Honor Award for top 20 ranked students in Sciences & Technology (1995), Egypt.

Professional Activities

Reviewer	IEEE Transactions on Image Processing
Reviewer	IEEE Journal of Selected Topics in Signal Processing
Reviewer	IEEE Signal Processing Letters
Reviewer	Pattern Recognition Letters
Reviewer	Journal of Signal, Image and Video Processing
Reviewer	Journal of Computers

Languages

Arabic	Fluent	(mother tongue)
English	Fluent	
German	Basic	

References

Available upon request