Hazem Hiary

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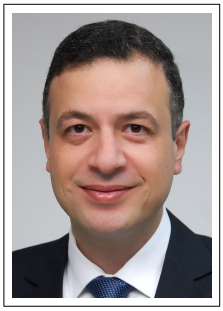

Personal Details

Date of Birth	January 3^{rd} 1979
Nationality	Jordanian
Marital Status	Married

Education

2004–2008	**PhD**, *University of Leeds*, Leeds, UK
2001–2004	**MSc**, *The University of Jordan*, Amman, Jordan
1997–2001	**BSc**, *The University of Jordan*, Amman, Jordan
1996–1997	**High School**, *Al-Salt Secondary School - Scientific Branch*, Al-Salt, Jordan

Academic positions held at Computer Science Dept., King Abdullah II School of Information Technology – The University of Jordan

2018–present	**Full Professor**
2013–2018	**Associate Professor**
2008–2013	**Assistant Professor**
2002–2004	**Teaching Assistant**

Administrative positions held at King Abdullah II School of Information Technology – The University of Jordan

2021–2022	**Dean**
2018–2020	**Deputy Dean**
2010–2012, & 2016–2017	**Chairperson of Computer Science Dept.**
2009–2010	**Dean Assistant for Computer Labs**

Doctorate thesis

Title	*Paper-Based Watermark Extraction with Image Processing*
Supervisors	Kia Ng, Roger Boyle
Subject	Document analysis & recognition, Image processing
University	University of Leeds

Master thesis

Title	*Using Fractal Coding Techniques in Data Hiding*
Supervisor	Jubair J. al-Ja'afer
Subject	Information hiding, Image processing
University	The University of Jordan

Fields of Teaching, Specialization, and Research Interests

Medical Imaging
Computer Vision
Image Processing
Information Hiding
Paper Watermarks
Computer Graphics
Multimedia Applications
Document Analysis & Recognition

Membership of Committees

2011–present **The Intel International Science and Engineering Fair – Jordan (ISEF)**
https://student.societyforscience.org/intel-isef

2017–present **Organizing committee of New Trends in Information Technology (NTIT) conference**
http://ntit-conf.com

2008–present **Academic committees membership at The University of Jordan**

PhD Program	Appointment & Promotion
Strategic Plan	MSc Comprehensive Exam
Curriculum Plan	Graduation Projects
Graduate Studies	Computer Efficiency Exam
Students Training	Quality Assurance & ABET Accreditation
Students Affairs	Faculty Exams

Languages

Arabic Excellent
English Excellent

Supervision of PhD students at The University of Jordan

2020–present **Bara Hammad**, *Deep Residual Neural Networks in Digital Pathology Workflow for Breast Cancer Prognosis*

2020–2022 **Shatha Awawdeh**, *Missing data handling using evolutionary algorithms in the context of supervised learning*

2019–2021 **Ahmad Bany Doumi**, *A New Hybrid Approach for Recognizing Faces Under Occlusions and Common Variations*

2016–2018 **Rawan Zaghloul**, *Multilevel Fractal Color Image Edge Detection Based on Quaternions*

Supervision of MSc students at The University of Jordan

2021–2022 **Mahmoud Abu Obaid**, *Document image binarization using deep learning*

2020–2021 **Yasmin Mashagbeh**, *Offline signature identification using image processing and robust features selection*

2020–2021 **Ghadeer Abu Galben**, *Facial Emotion Recognition using Image Processing Techniques and Machine Learning Classification*

2020 **Razan Debsi**, *An Enhanced Segmentation Algorithm For Arabic Handwriting Recognition*

2019–2020 **Munis Qasaymeh**, *Histopathological breast cancer grading for unlabeled data using crowdsourcing and deep learning*

2019–2020 **Raneem Abu Zayed**, *A Deep learning approach for recognition of handwritten Arabic mathematical expressions*

2019 **Abdallah Al-Hamedyeen**, *Goal Oriented Testing For A Pointer Data Type*

2019 **Ahmad Al Mughrabi**, *Hand-drawn Electric Circuit Diagrams Recognition Using Deep Learning*

2017–2018 **Reem Saadeh**, *Vehicles Classification using Image Processing and Convolutional Neural Network*

2017–2018 **Khaled Oudat**, *A Deep Learning Approach for Plants Leaves Classification*

2016–2018 **Omar Sawaeer**, *Removal of fog in digital images using filtering, restoration and reconstruction*

2015–2017 **Lubna Al-Tarawneh**, *A Recognition System for Printed Mathematical Expressions*

2015–2017 **Ahmad Yahia**, *Paper Watermarks Detection and Extraction Based on Digital Image Segmentation Techniques*

2014–2015 **Abeer Belbaisi**, *Data Balancing Impact on the Reliability of Individual Record Prediction*

2014–2015 **Mohammad Al-Laimon**, *Face Recognition using Image and Geometric Features, and Neural Networks*

2014–2015 **Huthaifa Al-Mekdadi**, *A Flower Recognition System based on image Processing and Neural Networks*

2014–2015 **Huthaifa Al-Adaileh**, *Off-line Cursive Signature Verification based on Image Processing and Geometric Features*

2014–2015 **Sawsan Al khdair**, *Off-line Arabic Handwriting Recognition Using Genetic Algorithm*

2013–2014 **Farah Al-Odwan**, *A Data Hiding System in Medical Images*

2012–2014 **Tareq Al-Zubaidi**, *Arabic Handwriting Recognition using Character Segmentation*

2012–2013 **Aisha Al-Fitouri**, *Character Recognition based on Braille Technique*

2011–2013 **Rawan Herzallah**, *A Bottom-up Approach for Extraction of Paper Watermarks*

2011–2012 **Dina Abd Al-Jawad**, *Classification of Cultures for Jordan Tourists using Intelligent Image Analysis*

2011–2012 **Radi Al-Khateeb**, *Vehicle License Plate Detection and Recognition using Digital Image Processing*

2011–2012 **Heba Al-Lahham**, *Measuring Proliferation Rate of Breast Cancer Using Medical Image Analysis*

2010–2011 **Jamal Said**, *Retrieval of Paper-Watermarks in Manuscripts Using Back-lighting and Digital Image Processing*

2010–2011 **Ola Karajeh**, *Securing Wireless Sensor Networks against Denial of Service Attacks*

Examination of PhD & MSc Theses at The University of Jordan

2022 **Mohammad Al-Qawasmi**, *Detecting Face Tampering in Videos using Deepfake Forensics*

2022 **Abdullah Ikhmais**, *A Physarum-Energy Optimization Algorithm for Solving the Capacitated Vehicle Routing Problem*

2021 **Ayah Karajah**, *COVID-19 Detection from X-ray Images and CT-Scan Images using Deep Learning*

2021 **Mohammad Mbaideen**, *Enhanced Completed Local Ternary Count using Wavelet Transform for Texture Classification*

2021 **Rawan Shahin**, *Blockchain-based security model for internet-of-things through detection of malicious devices*

2021 **Sajeda Al-Zaben**, *Measuring the academic students' performance at the University of Jordan using Netnography methodology*

2020 **Adam Quran**, *Blockchain Technology to Reduce the Risk in Jordanian Financial Institutions*

2020 **Ghadeer Tamimi**, *Electricity Theft Detection Using One-Class Support Vector Machine*

2020 **Raya Alyazjeen**, *Verification of Access Control Policies using Model Checking*

2020 **Tareq Alkhader**, *Detecting Compromised IoT Devices using Machine Learning*

2019 **Amenah Al-Bataineh**, *The Automation of Java Smart Card using Negative Testing*

2019 **Hani Younis**, *Banking Customer Churn Prediction System using Artificial Neural Network*

2018 **(PhD) Esam Al-Nsour**, *Enhancing Information Retrieval for Spatial Data Using R-Tree and its Variations*

2018 **Suhad Abu Reesh**, *An Intrusion Detection System based on a Dendrite Morphological Neural Network*

2017 **Ghofran Alqaraleh**, *Best Choice to Instance Selection for Active Learning in Network Intrusion Detection*

2017 **Mohammad Saadeh**, *Empirical Evaluation of Homogeneous and Heterogeneous Ensembles of Evolutionary Neural Networks*

2017 **Hanoof Al Khawaldeh**, *Toward a Better Understanding of Classification Learning: A Visual Approach*

2017 **Ayat Al Momani**, *Region-of-Interest Layers Download Scheduling of Video Streaming Over Dynamic Mobile Computing Environment*

2017 **Nafe' Al Sawa'er**, *Formal Modeling of Role Hierarchy and Delegation Constraints in Role Based Access Control Policies*

2017 **Arwa Al Dabobi**, *Visual Analysis of Graph Community Structures*

2016 **Randa Abu Saleh**, *Invariant Moments based Noise Classification using Feedforward Backpropagation Neural Network*

2016 **Ayman Al-refo'a**, *The Relation Between Thieves Fingerprint Minutiae and the Criminal Attributes*

2016 **Yousef Khdairat**, *Role-based Access Control Policy Testing based on Cause-effect Graph*

2016 **Isra Zaitoun**, *Satellite image Clouds Classification using Artificial Neural Network and Fuzzy Logic*

2015 **Baraa Al-Bashaireh**, *Performance Evaluation of Modern Copy-Move Forgery Detection Algorithms in Digital Images based on Block Matching*

2015 **Abdelrahman Tantawi**, *Automation of Thalassemia Microscopic Films Diagnosis based on Digital Image Processing*

2015 **Mohammad Arafah**, *Efficient Image Recognition Technique using Invariant Moments and Principle Component Analysis*

2015 **Zelal Al-Qatawneh**, *A Clinical Decision Support System to Predict Venous Thromboembolism*

2015 **Enas Jaara**, *Improving the Efficiency of Prediction-based Reversible Data Hiding Algorithms*

2014 **Nada Misk**, *Automatic Detection of Unusual Crowd Behaviour in Real-Time Video Surveillance Systems*

2014 **Ebtehal Abu-Obaid**, *A Clinical Decision Support System for Kidney Disease Diagnosis*

2014 **Ahmad Al-shamaileh**, *Data Encryption Techniques based on Combined Chaotic Maps and Biometric Keys*

2013 **Maisa Daoud**, *Dynamic Color Lookup Table Generation Using Kohonen Neural Network*

2013 **Eshraq Salameh**, *A Clustering Approach for Reconstructing Cross-cut Shredded Images*

2013 **Mohammad Ibaisi**, *Guided Handwritten Arabic Text Writer Identification Using DNA Sequences Algorithm*

2012 **Saleh Al-Ardi**, *A Common Document Exchange Model for Matrix Organizations*

2012 **Nidaa Aldeek**, *Quantification of Liver Tumors from CT Volumes of Abdominal Area*

2011 **Alia Madain**, *Audio Scrambling Technique Based on Cellular Automata*

2011 **Esraa Al-Dreabi**, *Automatic Detection of Breast Cancer*

2011 **Heba Al-Harahsheh**, *SQL Exception Coverage Using Genetic Algorithms*

2011 **Esam Al-Nsour**, *An Enhanced Node Splitting Algorithm in R-tree*

2010 **Ibrahim Al-Thamari**, *fMRI Time Series Analysis: The Cellular Automata Approach*

2009 **Hasan Suleiman**, *Efficient Node-Energy Utilization in Wireless Sensor Networks*

2009 **Abdullah Al-Soos**, *A Parallel Algorithm for Finding Best Number of Clusters Using Message Passing Interface (MPI)*

Selected Undergraduate Graduation Projects Supervision

e-Store System	e-Student Mobile Services at The University of Jordan
Car Rental System	Computer Graphics: 3D Driving Learning System
Vehicle Traffic System	Computer Graphics: 3D Learning Game for Kids
Business Card Creator	Mobile Application for Kids Interactive Learning

I-Bot System (Robotics)
Tourism Guide in Jordan
Hotel Reservation System
Students Internship Program
Smart Home Security System
Smart GPS Navigation System
Homomorphic Encryption in E-Voting Systems
Braillizer Program (Optical Braille Recognition)
University Instructor-Student Learning System
Student Course Registration System
Student Grade Prediction System
Vehicle Plate Recognition System
Computer Graphics: 3D Movie

Taught Courses

2008–present **Undergraduate level**
Computer Graphics
Pattern Recognition
Programming in C++
Digital Image Processing
2010–present **MSc level**
Digital Image Processing
2014–present **PhD level**
Digital Image Processing

Computer Skills

Programming Languages
- C++
- Java
- C#
- Visual Basic

Applications & Tools
- MATLAB
- LaTeX

Operating Systems
- Mac OSX
- Windows
- Linux

Hobbies and Interests

Reading
Traveling

Publications

Rawan Zaghloul and **Hazem Hiary**. A pair-mode model for underwater single image enhancement. *Multimedia Tools and Applications*, 2022. Springer. DOI: 10.1007/s11042-022-12135-4.

Shatha Awawdeh, Hossam Faris, and **Hazem Hiary**. EvoImputer: An evolutionary approach for missing data imputation and feature selection in the context of supervised learning. *Knowledge-Based Systems*, 236:107734, 2022. Elsevier. DOI: 10.1016/j.knosys.2021.107734.

Abdallah Alhameedyeen, Mohammad Alshraideh, and **Hazem Hiary**. Goal-oriented testing for pointer data type. *International Journal of Computers*, 6:60–67, 2021. International Association of Research and Science.

Ahmad Bany Doumi, Basel Mahafzah, and **Hazem Hiary**. Solving traveling salesman problem

using genetic algorithm based on efficient mutation operator. *Journal of Theoretical and Applied Information Technology (JATIT)*, 99(15):3768–3781, 2021. Little Lion Scientific.

Rawan Zaghloul and **Hazem Hiary**. A fast single image fog removal method using geometric mean histogram equalization. *International Journal of Image and Graphics*, 21(1):2150001, 2021. World Scientific. DOI: 10.1142/S0219467821500017.

Rawan Zaghloul and **Hazem Hiary**. Image colour edge detection using hypercomplex convolution. *International Journal of Signal and Imaging Systems Engineering*, 12(1/2):54–61, 2020. Inderscience. DOI: 10.1504/IJSISE.2020.113569.

Rawan Zaghloul, **Hazem Hiary**, and Moh'd Belal Al-Zoubi. A multifractal edge detector. *Multimedia Tools and Applications*, 79(9):5807–5828, 2020. Springer US. DOI: 10.1007/s11042-019-08420-4.

Bassam Qarallah, Bashar Al-Shboul, **Hazem Hiary**, Hamad Alsawalqah, Monther Tahat, Mohammad Al-Bsoul, and Yahia Othman. Remote sensing of cucumber powdery mildew using advanced unmanned vehicle and image processing techniques. *Fresenius Environmental Bulletin*, 28(12):9181–9185, 2019.

Huthaifa Almogdady, Saher Manaseer, and **Hazem Hiary**. A flower recognition system based on image processing and neural networks. *International Journal of Scientific & Technology Research*, 7(11):166–173, 2018.

Hazem Hiary, Rawan Zaghloul, and Moh'd Belal Al-Zoubi. Single-image shadow detection using quaternion cues. *The Computer Journal*, 61(3):459–468, 2018. Oxford University Press. DOI: 10.1093/comjnl/bxy004.

Hazem Hiary, Heba Saadeh, Maha Saadeh, and Mohammad Yaqub. Flower classification using deep convolutional neural networks. *IET Computer Vision*, 12(6):855–862, 2018. The Institution of Engineering and Technology. DOI: 10.1049/iet-cvi.2017.0155.

Rawan Zaghloul, **Hazem Hiary**, and Moh'd Belal Al-Zoubi. Fast multifractal edge detection using anisotropic diffusion. *Journal of Theoretical and Applied Information Technology (JATIT)*, 96(7):1787–1798, 2018. Little Lion Scientific.

Hazem Hiary, Rawan Zaghloul, Aryaf Al-Adwan, and Moh'd B. Al-Zoubi. Image contrast enhancement using geometric mean filter. *Signal, Image and Video Processing (SIViP)*, 11(5):833–840, 2017. Springer-Verlag London. DOI: 10.1007/s11760-016-1029-8.

Sawsan Hiary, Iyad Jafar, and **Hazem Hiary**. An efficient multi-predictor reversible data hiding algorithm based on performance evaluation of different prediction schemes. *Multimedia Tools and Applications*, 76(2):2131–2157, 2017. Springer US. DOI: 10.1007/s11042-015-3161-9.

Mohammed Arabiat, Nael Al-Basheer, Khair Eddin Sabri, and **Hazem Hiary**. Homomorphic encryption in e-voting systems: The university of jordan case study. In *Proc. NTIT: New Trends in Information Technology*, pages 169–175, The University of Jordan, Amman, Jordan, 2017.

Bassam AL-Qarallah, Bashar Al-Shboul, **Hazem Hiary**, Asmaa Aljawawdeh, Hamad Alsawalqah, and Monther Tahat. An image processing approach for cucumber powdery mildew infection detection. In *Proc. NTIT: New Trends in Information Technology*, pages 144–148, The University of Jordan, Amman, Jordan, 2017.

Hazem Hiary, Khair Eddin Sabri, Mohammed S. Mohammed, and Ahlam Al-Dhamari. A hybrid steganography system based on LSB matching and replacement. *International Journal of Advanced Computer Science and Applications (IJACSA)*, 7(9):374–380, 2016. The Science and Information Organization (SAI). DOI: 10.14569/IJACSA.2016.070951.

Hazem Hiary, Abdel Latif Abu Dalhoum, Alia Madain, Alfonso Ortega, and Manuel Alfonseca. Blind audio watermarking technique based on two dimensional cellular automata. *International Journal of Security and Its Applications (IJSIA)*, 10(9):175–184, 2016. Science & Engineering Research Support Society (SERSC). DOI: 10.14257/ijsia.2016.10.9.18.

Khair Eddin Sabri and **Hazem Hiary**. Algebraic model for handling access control policies. *Procedia Computer Science*, 83:653–657, 2016. Elsevier. DOI: 10.1016/j.procs.2016.04.146.

Abdel Latif Abu Dalhoum, Alia Madain, and **Hazem Hiary**. Digital image scrambling based on elementary cellular automata. *Multimedia Tools and Applications*, 75(24):17019–17034, 2016. Springer US. DOI: 10.1007/s11042-015-2972-z.

Jamal Said and **Hazem Hiary**. Watermark location via back-lighting modelling and verso registration. *Multimedia Tools and Applications*, 75(10):5673–5688, 2016. Springer US. DOI: 10.1007/s11042-015-2532-6.

Alia Madain, Abdel Latif Abu Dalhoum, **Hazem Hiary**, Alfonso Ortega, and Manuel Alfonseca. Audio scrambling technique based on cellular automata. *Multimedia Tools and Applications*, 71(3):1803–1822, 2014. Springer US. DOI: 10.1007/s11042-012-1306-7.

Nidaa Aldeek, Raja S. Alomari, M B Al-Zoubi, and **Hazem Hiary**. Liver segmentation from abdomen CT images with bayesian model. *Journal of Theoretical and Applied Information Technology (JATIT)*, 60(3):483–490, 2014. Little Lion Scientific.

Aisha Mousa, **Hazem Hiary**, Raja Alomari, and Loai Alnemer. Smart braille system recognizer. *International Journal of Computer Science Issues (IJCSI)*, 10(6):52–60, 2013.

Hazem Hiary, Raja S. Alomari, and Vipin Chaudhary. Segmentation and localisation of whole slide images using unsupervised learning. *IET Image Processing*, 7(5):464–471, 2013. The Institution of Engineering and Technology. DOI: 10.1049/iet-ipr.2013.0008.

Hazem Hiary, Raja S. Alomari, Maha Saadah, and Vipin Chaudhary. Automated segmentation of stromal tissue in histology images using a voting bayesian model. *Signal, Image and Video Processing (SIViP)*, 7(6):1229–1237, 2013. Springer-Verlag. DOI: 10.1007/s11760-012-0393-2.

Samah Al-Helo, Raja S. Alomari, Subarna Ghosh, Vipin Chaudhary, Gurmeet Dhillon, Moh'd B. Al-Zoubi, **Hazem Hiary**, and Thair M. Hamtini. Compression fracture diagnosis in lumbar: a clinical CAD system. *International Journal of Computer Assisted Radiology and Surgery (IJCARS)*, 8(3):461–469, 2013. Springer-Verlag. DOI: 10.1007/s11548-012-0796-0.

Hazem Hiary, Raja Alomari, Thaeer Kobbaey, Radi Z. Al-Khatib, (Mohammad Aiham) Al-Zu'bi, and Hashem Hasan. Off-line signature verification system based on DWT and common features extraction. *Journal of Theoretical and Applied Information Technology (JATIT)*, 51(2):165–174, 2013. Little Lion Scientific.

Heba Al-Lahham, Raja S Alomari, **Hazem Hiary**, and Vipin Chaudhary. Automating proliferation rate estimation from Ki-67 histology images. In *Proc. SPIE Medical Imaging 2012: Computer-Aided Diagnosis*, volume 8315, page 83152A, San Diego, CA, USA, 2012. DOI: 10.1117/12.911009.

Roger Boyle and **Hazem Hiary**. Seeing the invisible: Computer science for codicology. In WT. van Peursen, E. Thoutenhoofd, and A. van der Weel, editors, *Text Comparison and Digital Creativity, The Production of Presence and Meaning in Digital Text Scholarship*, pages 129–148. Brill, 2010. DOI: 10.1163/ej.9789004188655.i-328.52.

Kia Ng and **Hazem Hiary**. Digital acquisition and extraction of paper-based watermark designs with image processing. In Anne Regourd, editor, *Chroniques du manuscrit au Yémen*, volume 10. Centre Français d'Archéologie et de Sciences Sociales de Sanaa, 2010.

Hazem Hiary and Bayan Abu-Shawar. The impact of JU computerized systems on e-learning process. *European Journal of Scientific Research (EJSR)*, 38(2):328–336, 2009.

Hazem Hiary, Qadri Mishael, and Saleh Al-Sharaeh. Investigating cache technique for location of dependent information services in mobile environments. *European Journal of Scientific Research (EJSR)*, 38(2):172–179, 2009.

Roger D. Boyle and **Hazem Hiary**. Watermark location via back-lighting and recto removal. *International Journal of Document Analysis and Recognition (IJDAR)*, 12(1):33–46, 2009. Springer-Verlag. DOI: 10.1007/s10032-009-0080-1.

Hazem Hiary. *Paper-based watermark extraction with image processing*. PhD thesis, University of Leeds, 2008.

Hazem Hiary and Kia Ng. A system for segmenting and extracting paper-based watermark designs. *International Journal on Digital Libraries (IJDL)*, 6(4):351–361, 2007. Springer-Verlag. DOI: 10.1007/s00799-007-0008-7.

Hazem Hiary and Kia Ng. Automated paper-based watermark extraction and processing. In *Proc. Int. Conf. Automating Production of Cross Media Content for Multi-channel Distribution conference (AXMEDIS)*, pages 291–298, Leeds, UK, 2006. IEEE Computer Society Press. DOI: 10.1109/AXMEDIS.2006.14.

Hazem Hiary and Kia Ng. Segmentation approach for paper-based watermark extraction. *IADAT Journal of Advanced Technology on Imaging and Graphics (IJATig)*, 1(2):62–65, 2005.

Hazem Hiary and Kia Ng. Watermark: From paper texture to digital media. In *Proc. Int. Conf. Automating Production of Cross Media Content for Multi-channel Distribution conference (AXMEDIS)*, pages 261–264, Florence, Italy, 2005. IEEE Computer Society Press. DOI: 10.1109/AXMEDIS.2005.50.

Hazem Hiary and Kia Ng. Optical imaging for watermark: digitisation, segmentation, and vectorisation. In *Proc. Int. Conf. Multimedia, Image Processing, and Computer Vision (IADAT-micv2005)*, pages 178–182, Madrid, Spain, 2005. International Association for the Development of Advances in Technology (IADAT).

Hazem Hiary. Using fractal coding techniques in data hiding. Master's thesis, The University of Jordan, 2003.