CURRICULUM VITAE

Amal BEN HAMIDA DERBEL
Assistant Professor
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EDUCATIONAL BACKGROUND

2011 - 2016	Ph. D in Computer Systems Engineering (ISI) and Computer Science Co-tutelle between National School of Engineers of Sfax, Tunisia and University of Bordeaux, France.
2009 – 2011	Research Master Diploma in New Technologies of Dedicated Information Systems (NTSID) National School of Engineers of Sfax University of Sfax, Tunisia.
2008 – 2009	Professional Master Diploma in Information Systems Security (MPSSI) National School of Engineers of Sfax University of Sfax, Tunisia.
2006 - 2009	National Diploma in Computer Science Engineering National School of Engineers of Sfax University of Sfax, Tunisia.
2004 - 2006	Preparatory Cycle in Physics & Chemistry Preparatory Institute for Engineering Studies of Sfax University of Sfax, Tunisia.
2003 - 2004	Baccalaureate Diploma in Mathematics Secondary School 9 Avril 1938, Sfax, Tunisia.

RESEARCH ACTIVITIES

2011 – 2016 **Doctoral Thesis in Computer Systems Engineering**

Research Teams:
- REsearch Groups in Intelligent Machines (**REGIM-Lab**)
  National School of Engineers of Sfax, University of Sfax, Tunisia
- Laboratoire Bordelais de Recherche en Informatique (**LaBRI**)
  University of Bordeaux, France

Subject: Towards a New Video Surveillance Architecture Based on Application-Oriented Scalability

Supervisors: Chokri BEN AMAR, Professor, University of Sfax
Henri NICOLAS, Professor, University of Bordeaux
Mohamed KOUBAA, Assistant professor, University of Sfax

Abstract: The work presented in this thesis aims to develop a new architecture for video surveillance systems. Firstly, a literature review has led to classify the existing systems based on their applications level which dependents directly on the performed analytical functions. We, also, noticed that the usual systems treat all captured data while, actually, a small part of the scenes are useful for analysis. Hence, we extended the common architecture of surveillance systems with a pre-analysis phase that extracts and simplifies the regions of interest with keeping the important characteristics. Two different methods for pre-analysis were proposed : a spatio-temporal filtering and a modeling technique for moving objects. We contributed, too, by introducing the concept of application-oriented scalability through a multi-level application architecture for surveillance systems. The different applications levels can be reached incrementally to meet the progressive needs of the end-user. An example of video surveillance system respecting this architecture and using the pre-analysis methods was proposed.

Keywords: video surveillance, video pre-analysis, application-oriented scalability

2011 **Research internship at the Laboratoire Bordelais de Recherche en Informatique, University of Bordeaux, France**

Subject: Real-time logo detection on moving vehicles for tunnel management

Supervisor: Henri NICOLAS, Professor, University of Bordeaux

Abstract: In order to prevent road accidents and especially trucks containing hazardous products, a possible solution is to control the passage of these vehicles. The aim is to develop a system to verify the entry and exit of the same truck in a tunnel to ensure that no accidents or breakdowns have occurred inside the tunnel. To implement such a system, we began by detecting trucks and extracting distinctive marks to differentiate one from the other. These marks are the logos on the vehicle: plates and pictograms. Instead of trying to solve this problem on video media, we preferred to do it on digital images. Indeed, this amounts to discretizing in time the computer vision of the truck. Finally, a similarity score is calculated for the two input and output images to ensure that the vehicle passed through the tunnel safely.

Keywords: object detection, object identification, video surveillance

2010-2011 **Research Master at the REsearch Groups in Intelligent Machines**

Subject: Adaptive watermarking: Application to Traceability of Multimedia Documents in the Context of Video-on-Demand

Supervisors: Chokri BEN AMAR, Professor, University of Sfax
Mohamed KOUBAA, Assistant professor, University of Sfax

Abstract: Illegal copying of multimedia documents, especially video, has become a very common practice. To cope with this massive phenomenon, it has become necessary to control videos' circulation and especially to ensure their traceability. Thus, if a copy is redistributed as it is illegally, we are able to trace dishonest user who may be prosecuted. In this context fits our master's project, which proposes to develop a method for hierarchical

traceability and extend it with a robust watermarking technique to get a rapid fingerprinting system that guarantees tracing traitors by a fairy and reliable way.

Keywords: multimedia fingerprinting, traitor tracing, hierarchical traceability, video watermarking

ACADEMIC EXPERIENCES

Since 2022-2023 Assistant Professor at the Faculty of Sciences of Sfax, University of Sfax.

2018-2020 Contractual Assistant at National School of Engineers of Sfax, University of Sfax, Tunisia.

Taught Subjects :

- Integrated Course Introduction to Multimedia Systems
- Practical Work Introduction to Multimedia Systems
- Integrated Course Visual Basic for Application
- Integrated Course Computer Vision 1
- Practical Work Computer Vision 1
- Practical Work Development of mobile applications

Since 2017 Co-supervision of doctoral thesis in computer systems engineering, National School of Engineers of Sfax.

Subject: Fire detection and monitoring

Since 2016 Co-supervision of doctoral thesis in computer systems engineering, National School of Engineers of Sfax.

Subject: Video watermarking in the context of video surveillance

2011-2015 Contractual Assistant at Higher Institute of Computer Science and Multimedia of Sfax, University of Sfax, Tunisia.

Taught Subjects :

- Practical Work Multimedia Security (Network Security, Data Security)
- Practical Work Dynamic Web Development (JSP/Servlet)
- Tutorials Dynamic Web Development (JSP/Servlet)

2011-2012 Co-supervision Master Miage project, University of Bordeaux.

Subject: Image recalibration of moving vehicles in the context of video surveillance

INTERNSHIPS AND PROFESSIONAL EXPERIENCES

November 2018 Participation in "IEEE-SECURIDAY-ENIS Workshop", ENIS

November 2017 Participation in training "Elsevier" by Cnudst and Elsevier, FMS

November 2017 Participation in training "Big Data in Research – Impactful papers Vs Impact Factor" by Cnudst and Clarivate Analytics, FMS

October 2017 Participation in training "Soft skills: Accenture according to E-learning methodology" by University of Sfax, FMS

September 2017	Participation in the seminar "Big data and logistics" by RIT, ENIS
June 2017	Reviewer for Journal of Experimental & Theoretical Artificial Intelligence
June 2017	Reviewer for IEEE Access
June 2017	Participation in the cycle of 3 courses «Soft skill trainer» by Regim-Lab, ENIS : orator trainer, efficient trainer, designer trainer
October 2016	Reviewer for International Conference Sciences of Electronics, Technologies of Information and Telecommunications SETIT, 18-20 December 2016, Hammamet
Mai 2016	Participation in training «Training on developing applications using Flicker App Garden» by Regim-Lab, ENIS
January 2016	Participation in training «Training on scientific research indicators» by IEEE Tunisia section, ENIS
April-June 2015	Research internship at LaBRI, University of Bordeaux, France.
August 2014	Participation at IEEE Science and Information Conference SAI 2014, London, UK
June 2013	Reviewer for IEEE Symposium on Industrial Electronics & Applications, 22-25 September 2013, Malaysia
May-July 2013	Research internship at LaBRI, University of Bordeaux 1, France.
April 2013	Participation in the cycle of 4 courses «English for academic purposes», ENIS: Listening in academic settings, Reading research articles, Speaking in academic settings, writing research articles
December 2012	Participation in training LATEX by ReGIM-lab Training Office, ENIS
December 2012	Best Poster Award at 19 th Workshop WIMTA, Monastir, Tunisia «Real-Time Video pre-analyzing for video surveillance applications»
Mars-June 2012	Research internship at LaBRI, University of Bordeaux 1, France.
February 2012	Organization and animation of OpenCV Training, IEEE Signal Processing Society-Student Chapter @ ENIS.
April-August 2011	Research internship at LaBRI, University of Bordeaux 1, France **Subject:** Real-time logo detection on moving vehicles for tunnel management

April 2011	Participation in IEEE Symposium Series on Computational Intelligence (SSCI 2011), Paris, France.
May2010-March 2011	Research Master internship at ReGIM-Lab **Subject:** Adaptive watermarking: Application to Traceability of Multimedia Documents in the Context of Video-on-Demand
January 2011	Participation in training «English for academic purposes : Language used in academic settings», ENIS
January 2011	Participation in training «Pedagogical training cycle», ENIS
Juin 2010	Participation in training «Spring University of Pedagogy», ENIS
Mai 2010	Participation in training LATEX, ENIS
July-September 2009	Professional Master internship at ReGIM-Lab **Subject:** Shadow Detection for video sequences
February-June 2009	PFE internship at ReGIM-Lab **Subject:** Development of video watermarking ToolKit
February 2009	Test Of English as a Foreign Language (TOEFL-PBT) AMIDEST, Tunisia. **Score:** 533
January 2008	PFA internship at Ideryet Services, Sfax Configuration and installation of Netfiler/Iptables firewall
August 2007	First year internship at IGL Industries, Sfax Assembly and maintenance of software/hardware

AFFILIATIONS

Member in Image and Sound team in Laboratoire Bordelais de Recherche en Informatique
Member in REsearch Groups in Intelligent Machines
Graduate Student Member at IEEE
Member IEEE Women In Engineering
Member IEEE Student Branch @ ENIS

PUBLICATIONS

[J7] Daoud, Z., **Ben Hamida, A.**, Ben Amar, C. & Miguet, S. A one stream three-dimensional convolutional neural network for fire recognition based on spatio-temporal fire analysis. Evol. Syst. 15(6): 2355-2381 (2024)
[J6] Hammami, A., **Ben Hamida, A.**, Ben Amar, C. & Nicolas, H. Blind Semi-fragile Hybrid Domain-Based Dual Watermarking System for Video Authentication and Tampering Localization. Circuits Syst. Signal Process. 43(1): 264-301 (2024).

[J5] Daoud, Z., **Ben Hamida, A.** & Ben Amar, C. Fire Object Detection and Tracking Based on Deep Learning Model and Kalman Filter. Arab J Sci Eng (2023).

[J4] Daoud, Z., **Ben Hamida, A.** & Ben Amar, C. FireClassNet: a deep convolutional neural network approach for PJF fire images classification. Neural Comput & Applic 35, 19069–19085 (2023).

[J3] A. B. Hamida, C. B. Amar and Y. Albagory, "A New Color Model for Fire Pixels Detection in PJF Color Space", Intelligent Automation & Soft Computing, vol. 33, no.3, pp. 1607–1621, 2022.

[J2] Hammami, A.; **Ben Hamida, A.**; Ben Amar, C. "Blind semi-fragile watermarking scheme for video authentication in video surveillance context ", Multimed Tools Appl 80, 7479–7513 (2021).

[J1] Ben Hamida, A.; Koubaa, M.; Nicolas, H.; Amar, C. "Video surveillance system based on a scalable application-oriented architecture", Multimedia Tools and Applications, 2016, vol. 75, p. 17187-17213.

[C11] Hammami, A.; **Ben Hamida, A.**; Ben Amar, C.; "Robust Video Watermarking System Using Lifting Wavelet Transform And Singular Value Decomposition ", 12ème édition des ateliers de travail sur le Traitement et l'Analyse de l'Information : Méthodes et Applications (TAIMA) 2023, vol., no., pp., 27 May -01 June 2023, Hammamet, Tunisia.

[C10] Z. Daoud, **A. B. Hamida** and C. B. Amar, "A Fire Detection Model Based on Tiny-YOLOv3 with Hyperparameters Improvement," 2021 17th IEEE International Conference on Advanced Video and Signal Based Surveillance (AVSS), 2021, pp. 1-8, 16-19 November 2021, Washington, DC, USA.

[C9] Hammami, A.; **Ben Hamida, A.**; Ben Amar, C.; Nicolas, H. "Regions Based Semi-fragile Watermarking Scheme for Video Authentication", the 28th International Conference on Computer Graphics, Visualization and Computer Vision 2020, vol., no., pp., 18-22 May 2020, Plzen, Czech Republic.

[C8] Daoud, Z.; **Ben Hamida, A.**; Ben Amar, C. "Automatic video fire detection approach based on PJF color modeling and spatio-temporal analysis", the 27th International Conference on Computer Graphics, Visualization and Computer Vision 2019, vol., no., pp., 27-31 May 2019, Plzen, Czech Republic.

[C7] Hammami, A.; **Ben Hamida, A.**; Ben Amar, C. "A Robust Blind Video Watermarking Scheme based on Discrete Wavelet Transform and Singular Value Decomposition", the 14th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications (VISAPP 2019), vol. 4, no., pp. 597-604, 25-27 February 2019, Prague, Czech Republic.

[C6] Ben Hamida, A.; Koubaa, M.; Nicolas, H. ; Ben Amar, C. "Parallelepipedic Shape Modeling for Moving Objects in Video Surveillance Systems", IEEE Science and Information Conference 2014, vol., no., pp.379-383, 27-29 August, London, UK.

[C5] Ben Hamida, A.; Koubaa, M.; Nicolas, H. ; Ben Amar, C. "Toward Scalable Application-Oriented Video Surveillance Systems", IEEE Science and Information Conference 2014, vol., no., pp.384-388, 27-29 August, London, UK.

[C4] Ben Hamida, A.; Brulin, M.; Nicolas, H. "Logos Detection from moving vehicles", International Conference on Computer Vision Theory and Applications (VISAPP 2014), vol. 2, no., pp.613-618, 5-8 January 2014, Lisbon, Portugal.

[C3] Ben Hamida, A.; Koubaa, M.; Nicolas, H. ; Ben Amar, C. "Video Pre-analyzing and Coding in the Context of Video Surveillance ", Multimedia and Expo (ICME), 2013 IEEE International Conference on , vol., no., pp.1,4, San Jose, USA, 15-19 July 2013.

[C2] Ben Hamida, A.; Koubaa, M.; Nicolas, H. ; Ben Amar, C. "Spatio-Temporal Video Filtering for Video Surveillance Applications ", Multimedia and Expo Workshops (ICMEW), 2013 IEEE International Conference on , vol., no., pp.1,6, San Jose, USA, 19 July 2013.

[C1] Ben Hamida, A.; Koubaa, M.; Ben Amar, C.; Nicolas, H. "Hierarchical traceability of multimedia documents," Computational Intelligence in Cyber Security (CICS), 2011 IEEE Symposium on ,pp.108-113, Paris, France, 11-15 April 2011.

COMPETENCES CLES

Scientific Research	Image and Video Processing, Artificial Intelligence / Deep Learning, video surveillance, Digital Image and Video Watermarking
Programming Languages	C, C++, Qt, Opencv, Java, VB.Net, SQL, Matlab
Web Technologies	HTML, PHP, XML, Java Script, Applet, JSP/Servlet
Database Management Systems	Access, SQL Server, MySQL, Oracle
Operating Systems	Window, Linux

LANGUAGES SKILLS

Arabic	Mother tongue
French	Well (reading, written, spoken)
English	Well (reading, written, spoken)