

Mohamed Maher Ben Ismail, Ph.D

Computer Science department, College of Computer and Information Sciences,
King Saud University

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Research Interest	Artificial Intelligence, Machine Learning, Pattern Recognition, Image Processing, Spatial/Temporal Data Mining, Information Fusion, Statistical modeling.
Teaching Interest	Programming Languages Data Structures Algorithm Analysis and Design Artificial Intelligence Image Processing and Pattern recognition Applied machine learning Database design Data Mining Fundamentals of Engineering Signal Processing
Honors and Awards	Graduate Dean's citation award 2011. IEEE outstanding CECS student award 2011. Invited member – Golden Key International Honor Society. Graduate Research Assistantship – University of Louisville. Promoted to job grade 12 using the HAY evaluation method within STMicroelectronics on March 2004.
Education	Doctor of Philosophy in Computer Engineering and Computer Science University of Louisville, Ky, USA. May 2011. Dissertation: "Image annotation and Retrieval based on Multi-modal Feature Clustering and Similarity Propagation". Advisor: Prof. Hichem Frigui 1 year of Master of Automatic and Signal Processing National School of Engineering of Tunis, Tunisia, June 2005. advised by: Dr. Safiya Belghith Electrical Engineer Diploma National School of Engineering of Tunis, Tunisia, June 2002. Graduation with honors. Additional advanced math courses covering the areas of topology, measure theory, numerical analysis, convex optimization, theory of probability and operational research. Additional courses in electronics, telecommunication, Artificial intelligence and game theory. National Exam for admission to national engineering schools in Tunisia , ranked 250/3000, June 1999.

Associate degree in Mathematics and Physics

College of Fundamentals of Engineering, June 1999. Graduation with honors.

Professional appointments**Associate Professor at King Saud University**

College of Computer and Information Sciences. Computer Science department.
From March 2017 – present.

Assistant Professor at King Saud University

College of Computer and Information Sciences. Computer Science department. From September 2011 – March 2017.

Graduate Research Assistant

Multimedia Research Lab, CECS, UofL. From August 2006 – May 2011.

Graduate Research Assistant: Extensive experience with image processing and machine learning techniques. More specifically, I worked on the development and the implementation of Content-based Image Retrieval (CBIR) and annotation prototype that takes advantage of the developed algorithms for efficient web image annotation and retrieval. Also, I developed machine learning algorithms that integrate visual features with textual keywords, summarize, and organize data repositories.

Design and Development Engineer

STMicroelectronics, Ariana, Tunisia. From June 2002 - June 2006.

Design and Development engineer involved in the validation of 8-bits ST microcontroller tools. I was leading the design/development team of 8-bits ST microcontroller tools.

Design and Development Engineer Intern

STMicroelectronics, Ariana, Tunisia. From February 2002 - June 2002.

Graduation Project: Design and Development of validation platform for MDT50 emulator.

Electrical Engineer Intern

Poulina Group, Tunis, Tunisia. From July-August 2001.

Study and empirical comparison of several pressure sensors.

**Refereed
Conference/
Journal Papers**

Mohamed Maher Ben Ismail and Ouiem Bchir, "Automatic Fall Detection using Membership based Histogram Descriptors". Journal of Computer Science and Technology, Vol. 32, No. 2, pp. 356-367, 2017.

Mohamed Maher Ben Ismail and Ouiem Bchir, "Endoscopy Video Summarization using Novel Relational Motion Histogram Descriptor and Semi-supervised Clustering". Journal of Experimental & Theoretical Artificial Intelligence, Vol. 28, No. 4, pp. 629-653, 2016.

Mohamed Maher Ben Ismail and Ouiem Bchir, "Content based Video Categorization using Relational Clustering with Local Scale Parameter", International Journal of Computer Science and Information Technology, Vol. 8, No. 1, pp. 27-46, 2016.

Ouiem Bchir, Hichem Frigui and **Mohamed Maher Ben Ismail**, "Fuzzy clustering with learnable cluster dependent kernels", Pattern Application and Analysis Journal: Vol. 19, No. 4, pp. 919-937, 2016.

Ouiem Bchir and **Mohamed Maher Ben Ismail**, "Generic Evaluation Metrics for Hyperspectral Data Unmixing", The Soft Computing and Automation Journal, Vol. 22, No. 1, pp. 1-16, 2016.

Mohamed Maher Ben Ismail, Ouiem Bchir and Abdelmonim Artoli, "Optical Flow based

Analysis of Leukocyte Dynamics in Microcirculation", International Journal of Artificial Intelligence & Applications (IJAIA) Vol. 6, No. 3, pp. 25-34, 2015.

Mohamed Maher Ben Ismail and Ouïem Bchir, "*Semi-supervised Local Fusion Approach for Mine Detection in Sonar Data*", International Journal OF Intelligent Systems, Vol. 30, No. 11, pp. 1161–1183 (DOI 10.1002/int.21739), 2015.

Mohamed Maher Ben Ismail and Ouïem Bchir, "*CE Video Summarization using Relational Motion Histogram Descriptor*", International Conference on Optoelectronics and Image Processing (ICOIP 2015), July 2015, Chicago.

Ahmed Z. Emam, Yasser Ali and **Mohamed Maher Ben Ismail**, "*Adaptive Features Extraction for Capsule Endoscopy (CE) Video Summarization*", International Conference on Computer Vision and Image Analysis applications (ICCVIA'15), January 2015, Sousse, Tunisia.

Ouïem Bchir and **Mohamed Maher Ben Ismail**, "*Verbal Offense Detection in Social Network Comments using Novel Fusion Approach*", AI Communications, Vol. 28, No. 4, pp. 765-780, 2015.

Ouïem Bchir and **Mohamed Maher Ben Ismail**, "*Generalized Relative Spectral Unmixing Evaluation Measure*", IEEE-International Conference on Audio, Language and Image Processing (ICALIP), Shanghai, July 2014.

Mohamed Maher Ben Ismail and Ouïem Bchir, "*Survey on number of endmembers estimation approaches for unmixing hyperspectral data*", IEEE-International Conference on Audio, Language and Image Processing (ICALIP), Shanghai, July 2014.

Mohamed Alkaoud, Ibrahim AshShohail, and **Mohamed Maher Ben Ismail**, "*Automatic Image Annotation Using Fuzzy Cross-Media Relevance Models*", Journal of Image and Graphics, Vol. 2, No. 1, pp. 59-63, doi: 10.12720/joig.2.1.59-63, June 2014.

Mohamed Maher Ben Ismail and Ouïem Bchir, "*Insult Detection in Social Network Comments Using Possibilistic Based Fusion Approach*", Computer and Information Science, Springer Studies in Computational Intelligence, Vol. 566, pp 15-25, DOI: 10.1007/978-3-319-10509-3_2, , 2014.

Heelah Alraqibah, **Mohamed Maher Ben Ismail** and Ouïem Bchir, "*Empirical Comparison of Visual Descriptors for Content based X-ray Image Retrieval*", International Conference on Image and Signal Processing (ICISP'14), Cherbourg, June 2014.

Heelah Alraqibah, Ouïem Bchir and **Mohamed Maher Ben Ismail**, "*X-Ray Image Retrieval System Based on Visual Feature Discrimination*", Proceeding SPIE, vol. 9159, International Conference on Digital Image Processing (ICDIP), Athens, April 2014.

Mohamed M. Ben Ismail, Ouïem Bchir, and Ahmed Z. Emam, "*Endoscopy Video Summarization based on Multi-modal Descriptors and Possibilistic Unsupervised Learning and Feature Subset Weighting*". The Soft Computing and Automation Journal, vol. 20, no. 3, pp. 381-402, 2014. (DOI:10.1080/10798587.2014.890320).

M. Maher Ben Ismail and Hichem Frigui, "*Unsupervised Clustering and Feature Weighting based on Generalized Dirichlet Mixture Modeling*". Information Sciences. vol. 274, pp. 35-54, DOI: 10.1016/j.ins.2014.02.146, 2014.

Mohamed M. Ben Ismail, Ouïem Bchir, and Ahmed Z. Emam, "*Endoscopy Video Summarization based on Unsupervised Learning and Feature Discrimination*", IEEE Visual Communications and Image Processing. VCIP 2013. Malaysia 2013.

Ouïem Bchir, Hichem Frigui, and **Mohamed Maher Ben Ismail**. "*Semi-supervised fuzzy clustering with learnable cluster dependent kernels*". International Journal on Artificial Intelligence. Vol. 22, No. 3, pp. 13500. 2013.

Sarah Alotaibi, Sahar Kasim, Ouïem Bchir and **Mohamed Ben Ismail**. "*Empirical*

comparison of visual descriptors for multiple bleeding spots recognition in wireless capsule endoscopy video". 15th International Conference on Computer Analysis of Images and Patterns. CAIP 2013, pp. 402-407 UK. 2013.

Ouiem Bchir, **Mohamed Maher Ben Ismail** and Hichem Frigui. "*Mixture Analysis based on Spectral Summarization*", 5th IEEE workshop on Hyperspectral Image and Signal Processing: Evolution in remote Sensing. WHISPERS 2013. Florida, USA. 2013.

Ouiem Bchir, Hichem Frigui and **Mohamed Maher Ben Ismail**. "*Semi-Supervised clustering and Local Scale Learning algorithm*". International Conference on Artificial Intelligence. ICAI 2013. Tunisia. 2013.

Ouiem Bchir, Hichem Frigui and **Mohamed Maher Ben Ismail**. "*Semi-Supervised Relational Fuzzy clustering with Local Distance Measure Learning*". International Conference on Artificial Intelligence. ICAI 2013. Tunisia. 2013.

Mohamed Maher Ben Ismail and Ouiem Bchir, "*Automatic Image Annotation based on Semi-supervised Clustering and Membership based Cross Media Relevance Model*". International Journal of Pattern Recognition and Artificial Intelligence Vol. 26, No. 6, Dec 2012.

Ben Ismail, M. Maher; Frigui, H. "*Image Database Categorization using Robust Modeling of Finite Generalized Dirichlet Mixture*". International Journal of Signal and Imaging Systems Engineering, Vol. 5, No. 2, pp. 143-153, July 2012.

Mohamed Maher Ben Ismail, "*Image Database Categorization based on a Novel Possibilistic Clustering and Feature Weighting Algorithm*". International Proceedings of Computer Science & Information Technology, vol. 46, pp. 122-127, Singapore, 2012.

Mohamed Maher Ben Ismail, "*Possibilistic Clustering and Feature Weighting based on Robust Modeling of Finite Generalized Dirichlet Mixture*". 8th International Conference on Machine Learning and Data Mining (MLDM). Germany, 2012

Mohamed Maher Ben Ismail, "*Image Annotation and Retrieval Based on Multi-Modal Feature Clustering and Similarity Propagation*". PhD thesis packaged, produced and published by BiblioLabs under license by ProQuest UMI (available online for sale). 2011.

Mohamed Maher Ben Ismail and Hichem Frigui, "*Image Database Categorization using Robust Unsupervised Learning Of Finite Generalized Dirichlet Mixture Models*". International Conference on Image Processing (ICIP), pp. 2457 - 2460, 2011.

Mohamed Maher Ben Ismail, Hichem Frigui: "*Possibilistic Clustering based on Robust Modeling of Finite Generalized Dirichlet Mixture*". Twentieth conference of the International Association for Pattern Recognition (IAPR). pp. 573 - 576, ICPR 2010.

M. Maher Ben Ismail, Hichem Frigui: "*Image Database Categorization using Robust Modeling of Finite Generalized Dirichlet Mixture*" International Workshop on Image Processing Theory, Tools and Application (IPTA). pp. 334-339, 2010

M. Maher Ben Ismail, Hichem Frigui: "*Image Annotation based on Constrained Clustering and Semi-naive Bayesian Model*". IEEE symposium on Computers and Communications (ISCC). pp. 431-436, 2009.

M. Maher Ben Ismail, Hichem Frigui, Caudill Joshua: "*Empirical Comparison of automatic Image Annotation Systems*". International Workshop on Image Processing Theory, Tools and Application (IPTA), pp. 1-8, 2008.

Graduate and
undergraduate
teaching
experience

King Saud University, CCIS, Computer Science Department (ABET accredited program):

- **Fall 2011:** Computer programming 2 (CSC 113), Selected topics in CS (CSC

489), Bsc. Graduation project 1 (CSC 496).

- **Spring 2012:** Computer programming 2 (CSC 113), Selected topics in CS (CSC 489), Bsc. Graduation project 2 (CSC 497), Algorithm and analysis design (CSC 512).
- **Fall 2012:** Computer programming 2 (CSC 113), Selected topics in CS (CSC 489), Algorithm and analysis design (CSC 512).
- **Spring 2013:** Algorithm and analysis (CSC 311), Computer programming 2 (CSC 113), Bsc. Graduation project 1 (CSC 496), Advanced applications in pattern recognition and machine learning (CSC 566), Msc. Graduation project (CSC 597).
- **Fall 2013:** Algorithm and analysis (CSC 311), Computer programming 2 (CSC 113), Bsc. Graduation project 1 (CSC 496), Bsc. Graduation project 2 (CSC 497), Msc. Graduation project 1 (CSC 597), Msc. Graduation project 2 (CSC 598).
- **Spring 2014:** Algorithm and analysis (CSC 311), Bsc. Graduation project 2 (CSC 497), Image processing and pattern recognition (CSC 558), Msc. Graduation project 2 (CSC 598).
- **Fall 2014:** Computer programming 2 (CSC 113), Digital image processing (CSC 478), Bsc. Graduation project 1 (CSC 496), Advanced applications in pattern recognition and machine learning (CSC 566),
- **Spring 2015:** Computer programming 2 (CSC 113), Digital image processing (CSC 478), Bsc. Graduation project 1 (CSC 496), Bsc. Graduation project 2 (CSC 497), Msc. Graduation project 1 (CSC 597).
- **Fall 2015:** Computer programming 2 (CSC 113), Digital image processing (CSC 478), Bsc. Graduation project 1 (CSC 496), Advanced applications in pattern recognition and machine learning (CSC 566),
- **Spring 2016:** Database Design (CT1313), Computer programming 2 (CSC 113), Human Computer Interaction (CSC 440), Data warehouse & data mining (588), Msc. Graduation project 1 (CSC 597).
- **Fall 2016:** Database Design (CT1313), Computer programming 2 (CSC 113), Human Computer Interaction (CSC 440), Data warehouse & data mining (588), Msc. Graduation project 2 (CSC 598).

University of Louisville, Speed School of Engineering, CECS Department:

- **Fall 2005 to Fall 2007:** Lab and class instructor of C/C++ and Fundamentals of Engineering.

University of Louisville, Speed School of Engineering, Multimedia Research Lab:

- **Fall 2006:** Content Based Image Retrieval: lecturing weekly on a technical paper.
- **Spring 2008:** Multimedia Research Lab Seminar: lecturing on constrained semi-supervised clustering.
- **Fall 2009:** Multimedia Research Lab Seminar: lecturing on Automatic Image Annotation.

Student supervision

Supervisor of the following Bsc. Graduation projects:

- **Fall 2011 - Spring 2012:** *“Image Database Categorization based on Low-level Features Clustering”*.
- **Spring 2013 – Fall 2013:** *“Automatic Image Annotation Using Fuzzy Learning Approach”*.

- **Fall 2013 – Spring 2014:** *“Automatic Insult Detection in Social Networks Comments”*
- **Fall 2014 – Spring 2015:** *“Verbal Offense Detection in Social Networks Comments using Global Fusion Approach”*.
- **Spring 2015 - Fall 2015:** *“Video Database Categorization based on Low-level Feature Clustering”*.

Co-Supervisor of the following Msc. Graduation projects:

- **Spring 2013 – Fall 2013: Msc:** *“X-Ray Image Retrieval System Based on Visual Feature Discrimination and Multiple Instance Learning”*.
- **Fall 2013 – Spring 2014:** *“Hyperspectral mixture analysis with self-Estimation of the Number of Endmembers”*.
- **Spring 2015 – Fall 2015:** *“Multiple Bleeding Detection in Wireless Capsule Endoscopy”*.
- **Spring 2015 – Fall 2015:** *“Empirical comparison of visual descriptors for ulcer recognition in wireless capsule endoscopy video”*.
- **Spring 2016 - Fall 2016:** *“Region based Image Retrieval using Relevance Feature Weights”*.

Grants	Content based Endoscopy Video Summarization (RC121258), Principal Investigator, Budget: 40,000 Saudi Riyals, Agency: King Saud University, 2012-2013. Adaptive Capsule Endoscopy (CE) Image Classification (RC121256), Co-Principal Investigator, Budget: 40,000 Saudi Riyals, Agency: King Saud University, 2012-2013. Verbal Offense Detection in Social Network Comments (RC131013), Principal Investigator, Budget: 40,000 Saudi Riyals, Agency: King Saud University, 2013-2015. Generalized Relative Spectral Unmixing Evaluation Measure (RC131014), Principal Investigator, Budget: 40,000 Saudi Riyals, Agency: King Saud University, 2013-2015.
Committees	Fall 2016 – present: Head of the department EEC-HES accreditation committee. Fall 2014 –present: Head of QMS (Quality Management System of King Saud University) department committee. Fall 2015 –present: Head of the college website committee. Spring 2013 – present: Member of the department committee for ABET accreditation. Spring 2013 – Spring 2016: Member of the department EEC-HES accreditation committee Spring 2012 – present: Member of the department curriculum committee. Spring 2012 – Fall 2015: Member of the department field experience committee. Spring 2013 – present: Member of the college manpower committee. Spring 2013 – Spring 2016: Member of the college recruitment committee. Fall 2011 – Fall 2014: Member of the department capstone committee.
Activities and services	Reviewer for CCIS Research Center. Reviewer for Taif University Research Center. Reviewer for IEEE transactions on Fuzzy Systems.. Reviewer for Recent Patents on Computer Science. Reviewer for King Saud University journal. Reviewer for Computers in Human Behavior. Reviewer for IJAIA Journal. Reviewer for the journal Advances in Data Analysis and Classification. Reviewer for the several IEEE Conferences.
Affiliations	Member of the “Engage 2010” organized by the Office of the Civic Engagement, Leadership

and Service. University of Louisville, Spring 2010.
Member of the Institute of Electrical and Electronics Engineers (IEEE).
Member of the Society of Photographic Instrumentation Engineers (SPIE).

**Personal
Information**

Languages: Arabic: native
French: fluent in reading/writing/speaking
English: fluent in reading/writing/speaking
Italian: basic

**Doctoral
Coursework**

Combinatorial Optimization
Image Processing and Pattern Recognition
Content Based Image Retrieval
Pattern Recognition and Machine Intelligence
Data Mining
Artificial Intelligence
Multimedia and Hypertext
Content Based Video Retrieval
Computer Algorithms
Fuzzy theory

References

Dr. Hichem Frigui

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Director of Multimedia Research Lab
Computer Engineering & Computer Science, JB School of Engineering, University of
Louisville, KY, USA.
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Dr. Adel Elmaghraby

Professor and CECS Department Chair
Director of Innovative and Emerging Technologies Lab
Computer Engineering & Computer Science, JB School of Engineering, University of
Louisville, KY, USA.
Duthie Center for Engineering, 211
(502) 852 0470
adel@louisville.edu

Dr. Olfa Nasraoui

Associate professor
Chair of e-commerce and the founding director of the Knowledge Discovery and Web Mining
Lab
Computer Engineering & Computer Science, JB School of Engineering, University of
Louisville, KY, USA.
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