

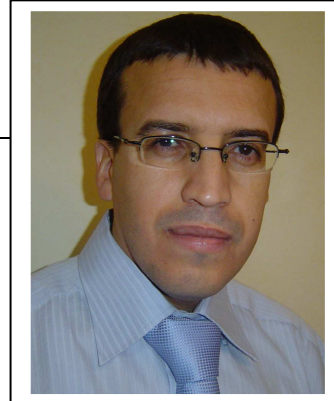
Yakoub Bazi

Curriculum Vitae

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1. PERSONAL INFORMATION

Surname: BAZI
First Name: Yakoub
Date and place of birth: December 22, 1971, Batna, Algeria
Nationality: Algerian
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Languages: Arabic, English, French, Italian



2. EDUCATION

- Doctorate of Philosophy (Ph.D.) degree in *Information and Communication Technologies (ICT)* (with specialization in pattern recognition and signal/image processing for remote sensing), University of Trento, Trento, Italy, 2005.
- Master of Science (M.Sc.) degree in *Electronics* (with specialization in Robotics), University of Batna, Batna, Algeria, 2000.
- State Engineer degree in *Electronics* (with specialization in Industrial Control), University of Batna, Batna, Algeria, 1994.
- Baccalauréat degree in *Mathematics*, Salah Eddine's High School of Batna, Batna, Algeria, 1989.

3. PROFESSIONAL EXPERIENCE

- Assistant Professor, College of Computer and Information Sciences, King Saud University, Saudi Arabia, from 01 October 2009 up to now.
- Assistant Professor, College of Engineering, Al-Jouf University, Saudi Arabia, from 21 August 2006 to 15 September 2009.
- Postdoctoral Researcher at the University of Trento, Italy, from 01 January 2006 to 30 June 2006.

- Lecturer at the University of M'sila, M'sila, Algeria, from 01 September 2000 to 30 September 2002.
- Teacher in the *Abis School of Computer Science*, Batna, Algeria, September 1997 to June 2000.

4. RESEARCH INTERESTS

The research activities of Dr. Yakoub Bazi are within the machine learning, pattern recognition and signal/image processing fields. His main interests consist in developing advanced methodologies for solving challenging problems related to these fields such as change detection in multitemporal images, data classification, data fusion, regression and complex constrained optimization problems. The related application domains are those which require any automatic image/signal processing and/or pattern recognition methodology, in particular: i) remote sensing, ii) biomedical engineering, iii) text classification, iv) speech processing and v) biometric security systems.

4.1 METHODOLOGIES

A. CHANGE DETECTION IN MULTITEMPORAL IMAGES

- Unsupervised change detection in multitemporal images
- Automatic parametric and nonparametric techniques for the selection of the decision threshold in unsupervised change-detection problems
- Contextual techniques (e.g., Markov Random Fields and level-set methods) for unsupervised change detection
- Multisensor data fusion approaches for unsupervised change detection
- Kernel methods for unsupervised change detection

B. SUPERVISED, UNSUPERVISED AND SEMI-SUPERVISED CLASSIFICATION

- Kernel methods, artificial neural network and statistical supervised classification methodologies
- Transductive methods for semi-supervised classification
- Kernel-based clustering methods for unsupervised classification

C. REGRESSION

- Kernel and artificial neural network methods for regression
- Semi-supervised regression with limited training samples
- Bayesian regression methods

D. EVOLUTIONARY COMPUTATION

- Solution of complex constrained optimization problems using genetic algorithms, swarm particles and ant colony optimization methods.

4.2 APPLICATIONS

A. REMOTE SENSING

- Land-cover/Land use maps
- Agriculture (crop mapping, monitoring of shifting cultivation)
- Forest applications
- Desertification monitoring
- Damage assessment (forest fires, floods)
- Water quality analysis
- Content based remote sensing image retrieval

B. BIOMEDICAL ENGINEERING

- Electrocardiogram (ECG) signal processing for cardiac pathology detection
- Electroencephalogram (EEG) signal processing for brain abnormality detection (e.g., Seizures, Epilepsy)
- Microarray image analysis for gene expression

C. BIOMETRICS

- Person identification using ECG signals
- Enhancing the security of biometric systems using life-based signals

5. AWARDS

- Bronze medal Malaysian exhibition., February 2012
- Gold and double Gold medals British invention show, October 2011
- Silver medal Malaysian exhibition., March 2011
- Best Reviewer for the IEEE GRSL on Geoscience and remote sensing letters, 2011
- Senior Member IEEE since April 2010
- Scholarship PhD award from the university of Trento, Italy, 2002-2005

6. REFEREEING AND MEMBERSHIPS

- Reviewer for the IEEE transactions on Geoscience and Remote Sensing
- Reviewer for the IEEE transactions on Neural Networks
- Reviewer for the IEEE Geoscience and Remote Sensing Letters
- Reviewer for the Remote Sensing of Environment journal
- Reviewer for the International journal of Remote Sensing IJRS
- Reviewer for the Pattern Recognition letters
- Reviewer for the journal of applied remote sensing
- Reviewer for pattern recognition letters journal
- Reviewer for electronic letters journal
- Reviewer for the international journal of applied earth observation and geoinformation
- Reviewer for chemometric and intelligent laboratory journal
- Reviewer for signal, image and video computing journal
- Reviewer for optical engineering journal
- Reviewer for the arabian journal for science and engineering
- Reviewer for projects funded by King Abdulaziz city for science and technology KACST
- Reviewer for the annual IEEE International Geoscience and Remote Sensing symposium (IGARSS)
- Member of the Institute of Electrical and Electronic Engineers (IEEE)
- Member of the Italian National Interuniversity Consortium for Telecommunications (CNIT) between 2002 and 2005

7. RESEARCH PROJECTS

- Principal investigator of the research project titled “A smart cardiovascular remote sensing system”, (Undergoing) Project identifier: 11-MED-1832-02, National plan for science and technology (NPST), King Abdul-Aziz city of science and technology, Saudi Arabia, 2012-2014.
- Co-investigator of the research project titled “PalmWatch: Monitoring of palm tree farms with advanced remote sensing techniques”, (Undergoing) Project identifier: 10-SPA-1192-02, National plan for science and technology (NPST), King Abdul-Aziz city of science and technology, Saudi Arabia, 2012-2014.
- Principal investigator of the research project titled “Classification of high spatial remote sensing

images with genetic approaches”, (Finished) Project identifier: AT-27-13, Funded by King Abdul-Aziz city of science and technology, Saudi Arabia, 2007-2009.

8. TEACHING AND SUPERVISION ACTIVITY

8.1 TEACHING

- CEN 343, Introduction to random processes, Computer Engineering department, CCIS, KSU, 2013-2014
- CEN 600, Computer Engineering department, CCIS, KSU, 2011-2012
- Probability and engineering statistics (STAT 324), Al Jouf University, 2008-2009
- Electronics 1 (EE 312), Al Jouf University, Saudi Arabia, 2008-2009
- Laboratory of Electronics 1 (EE 313), Al Jouf University, Saudi Arabia, 2008-2009
- Computer Programming 1 (CSC 102), Al Jouf University, Saudi Arabia, 2007-2009
- Computer programming 2 (CSC 104), Al Jouf University, Saudi Arabia, 2006-2009
- Report Writing (ENGL 126), Al Jouf University, Saudi Arabia, 2007-2008
- Computer Architecture (CSC 101), Al-Jouf University, Saudi Arabia, 2006-2007
- Microprocessor based systems, University of M’sila, Algeria, 2000-2002
- Laboratory of signal/image processing, University of M’sila, Algeria, 2000-2002
- Probability and statistics, Abis school, Batna, Algeria, 1997-2002
- Numerical analysis, Abis school, Batna, Algeria, 1997-2002
- C++ programming language, Abis school, Batna, Algeria, 1997-2002

8.2 THESIS SUPERVISION

- Essam Othman, “Level set methods for remote sensing image segmentation”, MSc Thesis, Department of computer engineering, College of computer and information sciences, King Saud University, 2012.
- Davide Cantarella, “Unsupervised Change Detection in Multitemporal Remote-Sensing Images with One-Class Support Vector Machines”, Bachelor degree in Telecommunication Engineering, University of Trento, 2005.
- Laura Tonelli, “Automatic Classification of Biomedical Microarray Images”, Bachelor degree in Telecommunication Engineering, University of Trento, 2005.
- Stefano Bertamini, “Support Vector Machine Classification of Biomedical ECG Signals”, Bachelor degree in Telecommunication Engineering, University of Trento, 2005.

- Massimo Flaim, “Classification of Very High Spatial Resolution Hyperspectral Remote-Sensing Images with Support Vector Machines”, Bachelor degree in Telecommunication Engineering, University of Trento, 2005.
- Djriou Samir, “Design and Realization of a Microcontroller-based System”, State Engineer degree in Electronics, University of M’sila, 2001.
- Benmansour Nabil, “Fuzzy Control of a Two-Link Robot Arm,” State Engineer degree in Electronics, University of Batna, 2000.

9. PUBLICATIONS: 46

9.1 INTERNATIONAL JOURNALS: 21

- [J1] N. Alajlan, **Y. Bazi**, H. AlHichri, F. Melgani, and R.R. Yager, “Using OWA fusion operators for the classification of hyperspectral images,” *IEEE journal of Selected Topics in Applied Earth Observation and Remote Sensing*, vol. 6, pp. 602-614, 2013.
- [J2] H. Hichri, **Y. Bazi**, N. Alajlan, and S. Malek, “Interactive segmentation for change detection in multispectral remote sensing images”, *IEEE Geoscience and Remote Sensing Letters*, vol. 10, pp. 298-302, 2013.
- [J3] L. Lorenzi, F. Melgani, G. Mercier, and **Y. Bazi**, “Assessing the Reconstructability of shadow areas in VHR images”, *IEEE Transactions on Geoscience and Remote Sensing*, vol. 51, pp. 2863-2873, 2013.
- [J4] N. Alajlan, **Y. Bazi**, F. Melgani and R. R. Yager, “Fusion of supervised and unsupervised learning for improved classification of hyperspectral images”, *Information Sciences*, 2012 (*in press*).
- [J5] N. Alajlan, **Y. Bazi**, F. Melgani, S. Malek, and M. A. Bencherif, "Detection of premature ventricular contraction in electrocardiogram signals with kernel methods ", *Signal, image and Video Processing*, 2012 (*in press*).
- [J6] F. Douak, F. Melgani, N. Alajlan, E. Pasolli, **Y. Bazi**, and N. Benoudjit, “Active learning for spectroscopic data regression,” *Journal of Chemometrics*, vol. 26, pp. 374-383, 2012.
- [J7] S. Islam, N. Alajlan, **Y. Bazi** and H. Hichri, “HBS: A novel biometric feature based on heart morphology,” *IEEE Transactions on Information Technology in Biomedicine*, vol. 16, 445-453, 2012.
- [J8] E. Pasolli, F. Melgani, N. Alajlan, and **Y. Bazi**, “Active learning methods for biophysical parameter estimation,” *IEEE Transactions on Geoscience and Remote Sensing*, vol. 50, pp. 4071-4084, 2012.
- [J9] **Y. Bazi**, N. Alajlan, and F. Melgani, “Improved estimation of water chlorophyll concentration with semisupervised Gaussian process regression,” *IEEE Transactions on Geoscience and Remote* vol. 50, pp. 2733-2743, 2012.

- [J10] E. Pasolli, F. Melgani, and **Y. Bazi**, "Support vector machine active learning through significance space construction", *IEEE Geoscience and Remote Sensing Letters*, vol. 8, pp. 431-435, 2011.
- [J11] **Y. Bazi**, F. Melgani, and H. Al-Sharari, "Unsupervised changed in multispectral remotely sensed imagery with level set methods", *IEEE Transactions on Geoscience and Remote Sensing*, vol. 48, pp. 3178-3187, 2010.
- [J12] **Y. Bazi** and F. Melgani, "Gaussian process approach for remote sensing image classification", *IEEE Transactions on Geoscience and Remote Sensing*, vol.48, pp. 186-197, 2010.
- [J13] **Y. Bazi**, F. Melgani, and L. Bruzzone, "A genetic expectation maximization method for unsupervised change detection in multitemporal SAR imagery", *International Journal of Remote Sensing*, vol. 30, pp. 6591-6610, 2009.
- [J14] N. Ghoggali F. Melgani, and **Y. Bazi**, "A multiobjective genetic SVM approach for classification problems with limited training samples", *IEEE Transactions on Geoscience and Remote Sensing*, vol. 47, pp. 1707-1718, June, 2009.
- [J15] F. Melgani, and **Y. Bazi**, "Classification of electrocardiogram signals with support vector machines and swarm particle optimization", *IEEE Transactions on Information Technology in Biomedicine*, vol. 12, pp. 667-677, September 2008.
- [J16] **Y. Bazi** and F. Melgani, "Semi-supervised PSO-SVM regression for biophysical parameter estimation", *IEEE Transactions on Geoscience and Remote Sensing*, vol. 45, pp. 1887-1895, June, 2007.
- [J17] **Y. Bazi**, L. Bruzzone and F. Melgani, "Image thresholding based on the EM algorithm and generalized Gaussian distribution", *Pattern Recognition Journal*, vol. 40, No. 4, pp. 619-634, February 2007.
- [J18] **Y. Bazi** and F. Melgani, "Towards an optimal SVM classification system for hyperspectral remote sensing images", *IEEE Transactions on Geoscience and Remote Sensing*, vol. 44, No. 4, pp. 3374-3385, November 2006.
- [J19] F. Melgani and **Y. Bazi**, "Markovian fusion approach to robust unsupervised change detection in remotely sensed imagery", *IEEE Geoscience and Remote Sensing Letters*, vol. 3, No. 4, pp. 457-461, October 2006.
- [J20] **Y. Bazi**, L. Bruzzone, and F. Melgani, "Automatic identification of the number and values of decision thresholds in the log-ratio image for change detection in SAR images", *IEEE Geoscience and Remote Sensing Letters*, vol. 3, No. 3, pp. 349-353, July 2006.

- [J21] **Y. Bazi**, L. Bruzzone, and F. Melgani, "An unsupervised approach based on the generalized Gaussian model to automatic change detection in multitemporal SAR images", *IEEE Transactions on Geoscience and Remote Sensing*, vol. 43, No. 4, pp. 874-887, April 2005.

9.2 INTERNATIONAL CONFERENCES: 25

- [C1] **Y. Bazi**, Naïf Alajlan, H. AlHichri, and Salim Malek, "domain adaptation methods for ECG classification ", Proc. of the *IEEE International Conference on Computer medical applications ICCMA-2013*, Tunisia,, January 2013.
- [C2] N. Alajan, **Y. Bazi**, H. Hichri, and E. Othman, "Robust classification of hyperspectral images supervised and unsupervised learning paradigms ", Proc. of the *IEEE International Geoscience and Remote Sensing Symposium IGARSS-2012*, Germany , pp. 1417-1420, July 2012.
- [C3] N. Alajan, **Y. Bazi**, H. Hichri, and E. Othman, "Interactive change detection techniques in multitemporal multispectral remote sensing images", Proc. of the *IEEE International Geoscience and Remote Sensing Symposium IGARSS-2012*, Germany , pp. 6173-6176, July 2012.
- [C4] **N. Alajan**, **N. Amour**, **Y. Bazi**, and H. Hichri, "A cluster ensemble method for robust unsupervised classification of VHR remote sensing images", Proc. of the *IEEE International Geoscience and Remote Sensing Symposium IGARSS-2011*, Canada, July 2011.
- [C5] **Y. Bazi**, and F. Melgani, "Semisupervised Gaussian Process Regression for biophysical Paramter Estimation", Proc. of the *IEEE International Geoscience and Remote Sensing Symposium IGARSS-2010*, Honolulu, Hawaii, USA, July 2010.
- [C6] M. Mansour, **Y. Bazi**, and K. N. Al-tallaq, "Robust classification of power quality signals", Third International Conference on Electrical Engineering Design and Technologies, Sousse, *Tunisia*, November, 2009.
- [C7] **Y. Bazi**, and F. Melgani, "A variational level-set method for change detection in remote sensing images", Proc. of the *IEEE International Geoscience and Remote Sensing Symposium IGARSS-2009*, Cape Town, South Africa, July 2009.
- [C8] **Y. Bazi**, and F. Melgani and H. D. Al-Sharari, "An automatic method for counting olive trees in very high spatial remote sensing images", *Proc. of the IEEE International Geoscience and Remote Sensing Symposium IGARSS-2009*, Cape Town, South Africa, July 2009.
- [C9] K. N. Al-tallaq, **Y. Bazi**, and M. Mansour, "Fast discrimination between transformer inrush and fault current with SVM", *Fifth Saudi technical conference and exhibition, STCEX, Riyadh, Saudi Arabia*, 11-14 January, 2009.

- [C10] F. Abdessamed, and **Y. Bazi**, "Kernel regression for robot arm manipulator control", *Fifth Saudi technical conference and exhibition, STCEX, Riyadh, Saudi Arabia, 11-14 January, 2009*.
- [C11] F. Melgani, and **Y. Bazi**, "A Pattern recognition method for arrhythmia detection in ECG signals", *International Conference of Electrical Engineering Design and Technologies ICEDT08, Hammamet, Tunisia, 8-10 November 2008*.
- [C12] F. Melgani, and **Y. Bazi**, "Detecting Premature Ventricular contractions in ECG Signals with Gaussain Processes", *International Conference of Computers in Cardiology ICCV 2008, Bologna, Italy, 14-17 September 2008*.
- [C13] **Y. Bazi**, and F. Melgani " Gaussian process for classification of hyperspectral remote sensing images", *Proc. of the IEEE International Geoscience and Remote Sensing Symposium IGARSS-2008, Boston, USA, July 2008*.
- [C14] F. Melgani, and **Y. Bazi**, "Evolutionary Computation Approach to ECG Signal Classification", *IEEE International Conference on Biomedical Engineering Systems and Technologies BIOSTEC 2008, Funchal- Madeira, Portugal, 28-31 January 2008*.
- [C15] **Y. Bazi**, and F. Melgani "A Multiobjective PSO Inflation Methodology for SVM Regression with limited Training Samples", *Proc. of the IEEE-International Geoscience and Remote Sensing Symposium IGARSS-2007, Barcelona, Spain, July 2007*.
- [C16] **Y. Bazi** and F. Melgani "A Novel System Based on Particle Swarm Optimization and Support Vector Machine for the Estimation of Biophysical Parameters from Remote Sensing Images", ", *Proc. of the International Conference on ICCCP'07, Muscat, Oman, February 2007*.
- [C17] F. Melgani and **Y. Bazi**, "Robust unsupervised change detection with markov random fields", *Proc. of the IEEE-International Geoscience and Remote Sensing Symposium IGARSS-2006, Denver, Colorado, USA, July 2006*.
- [C18] N. Ghoggali, **Y. Bazi** and F. Melgani, "A Multiobjective genetic data inflation methodology for support vector machine classification", *Proc. of the IEEE-International Geoscience and Remote Sensing Symposium IGARSS-2006, Denver, Colorado, USA, July 2006*.
- [C19] **Y. Bazi**, L. Bruzzone, and F. Melgani, "Automatic analysis of the Log-ratio Image for the Detection of Multiple Changes in Multitemproal SAR Images", *Proc. of the SPIE Conference on Image and Signal Processing for Remote Sensing, Bruges, Belgium, 19-22 September 2005*.
- [C20] **Y. Bazi**, L. Bruzzone, and F. Melgani, "Change Detection in Multitemporal SAR Images Based on the EM-GA Algorithm and Markov Random Fields", *Third International Workshop on the*

Analysis of Multitemporal Remote Sensing Images, Beau Rivage, Mississippi, USA, 16-18 May 2005.

- [C21] **Y. Bazi**, L. Bruzzone, and F. Melgani, "Change Detection in Multitemporal SAR Images Based on Generalized Gaussian Distribution and EM Algorithm", *Proc. of the SPIE Conference on Image and Signal Processing for Remote Sensing X*, Gran Canaria, Spain, 13-15 September 2004, vol. 5573, pp.364-375.
- [C22] **Y. Bazi**, L. Bruzzone, and F. Melgani, "An Approach to Unsupervised Change Detection in Multitemporal SAR Images Based on the Generalized Gaussian Distribution", *Proc. of the IEEE-International Geoscience and Remote Sensing Symposium IGARSS-2004*, Anchorage, USA, 20-24 September 2004, vol. 2, pp. 1402-1405.
- [C23] **Y. Bazi**, L. Bruzzone, and F. Melgani, "A Novel Technique for Unsupervised Change Detection in Multitemporal SAR Images", *Conference on Biological and Physical Processes on Land, 35th COSPAR Scientific Assembly*, Paris, France, 18-25 July, 2004.
- [C24] D. Melaab and **Y. Bazi**, "Centralized and Decentralized Coordination Control of a Multifingered Robot Hand", *International Conference on System Control*, Annaba, Algeria, November 1999, pp. 182-185.
- [C25] Benzid, D. Melaab and **Y. Bazi**, "Mise en Œuvre d'un Système de Communication Multipoints Basé sur les Microcontrôleurs MCS8051", *International Conférence on Computer Science CII'99*, Blida, Alegria, May 1999, pp. 314-322.