



Miguel Pagola Barrio

Curriculum Vitae

I. Professional data

Affiliation: Public University of Navarra

Official address: Dept. Computer Science and Artificial Intelligence, Public University of Navarra, Navarra, Spain

Current position(s): Assistant Lecturer

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II. Education

BS (2001) - Public University of Navarra (Spain) – Industrial Engineering (Electronics and Control)

MS (2005) - Public University of Navarra (Spain) – Instrumentation and Control

PhD (2008) - Public University of Navarra (Spain) - Computer Science

III. Publications

Summary:

No. of SCI journals papers: 12

No. of Book chapters: 4

No. of LNCS (or similar series): 2

Ph D theses advising: 0

Published journals papers:

- E. Barrenechea, H. Bustince, M. Pagola, J. Fernandez, “Construction of interval-valued fuzzy entropy invariant by translations and scalings”, *Soft Computing*, DOI 10.1007/s00500-009-0480-7 in press.

- H. Bustince, M. Pagola, E. Barrenechea, J. Fernandez, P. Melo-Pinto, P. Couto, H.R. Tizhoosh, J. Montero, "Ignorance functions. An application to the calculation of the threshold in prostate ultrasound images", *Fuzzy sets and systems*, 161, 20-36, (2009).
- H. Bustince, E. Barrenechea, M. Pagola, J. Fernandez, "Interval-valued fuzzy sets constructed from matrices: Application to edge detection", *Fuzzy sets and systems*, 160, 1819-1840, (2009).
- M. Pagola, R. Ortiz, I. Irigoyen, H. Bustince, E. Barrenechea, P. Aparicio-Tejo, C. Lamsfus, B. Lasa, "New Method to Assess Barley Nitrogen Nutrition Status Based on Image Colour Analysis. Comparison with SPAD-502", *Computers and Electronics in Agriculture*, 65, 213-218, (2009).
- Bustince, H., Barrenechea, E., Pagola, M., "Generation of interval-valued fuzzy and Atanassov's intuitionistic fuzzy connectives from fuzzy connectives and from K-alpha operators: Laws for conjunctions and disjunctions, amplitude", *International Journal of Intelligent Systems*, 23(6), 680-714 (2008).
- H. Bustince, E. Barrenechea and M. Pagola, "Relationship between Restricted Dissimilarity Functions, Restricted Equivalence Functions and Normal EN-Functions: Image Thresholding Invariant". *Pattern Recognition Letters*, 29 (4), 525-536, (2008).
- H. Bustince, J. Montero, E. Barrenechea, M. Pagola, "Semiautoduality in a restricted family of aggregation operators", *Fuzzy Sets and Systems*, 158 (12), 1360-1377 (2007).
- H. Bustince, E. Barrenechea, M. Pagola, "Image thresholding using restricted equivalence functions and maximizing the measures of similarity", *Fuzzy Sets and Systems*, 158 (5), 496-516 (2007).
- H. Bustince, M. Pagola, E. Barrenechea "Construction of fuzzy indices from fuzzy DI-subsethood measures: application to the global comparison of images", *Information Sciences*, 177, 906- 929 (2007).
- H. Bustince, E. Barrenechea, M. Pagola, F. Soria, "Weak fuzzy S-subsethood measures. Overlap index", *International Journal of Uncertainty Fuzziness and Knowledge-based Systems* 14 (5), 537-560 (2006).
- H. Bustince, E. Barrenechea, M. Pagola, "Restricted Equivalence Functions", *Fuzzy Sets and Systems*, 157 (17), 2333-2346 (2006).
- H. Bustince, V. Mohedano, E. Barrenechea, M. Pagola, "Definition and Construction of Fuzzy DI-subsethood Measures", *Information Sciences*, 176 (21), 3190-3231 (2005).

Book chapters:

- H. Bustince, M. Pagola, P. Melo-Pinto, E. Barrenechea and P. Couto, "Use of Atanassov's Intuitionistic Fuzzy Sets for modelling the uncertainty of the thresholds associated to an image" Chapter of the book, *Fuzzy Sets and Their Extensions: Representation, Aggregation and Models. Intelligent Systems from Decision Making to Data Mining, Web Intelligence and Computer Vision*, Springer-Verlag.
- H. Bustince, J. Montero, M. Pagola, E. Barrenechea and D. Gomez, "A survey of Interval valued fuzzy sets", Chapter of the book, *Handbook of Granular computing*, Eds.: W. Pedrycz, A. Skowron, V. Kreinovich, John Wiley & Sons, (2008).
- H. Bustince, V. Mohedano, E. Barrenechea, M. Pagola, "Aggregation Operations With Special Properties. Construction From Other Aggregation Operators And Proximity Functions. Generalized Distances" Chapter of the book *Proceso de Toma de Decisiones, Modelado y Agregación de Preferencias*, 125-140 (2005).
- H. Bustince, V. Mohedano, E. Barrenechea, M. Pagola, "A Study of the Intuitionistic Fuzzy S-Implications. First Properties" Chapter of the book *Proceso de Toma de Decisiones, Modelado y Agregación de Preferencias*, 141-150 (2005).

International Conferences:

- P. Couto, M. Pagola, H. Bustince, E. Barrenechea, P. Melo-Pinto. Image segmentation using A-IFSs. IPMU 2008, Malaga Spain.
- H. Bustince, J. Montero, E. Barrenechea, M. Pagola, "Laws for conjunctions and disjunctions in Interval type 2 fuzzy sets", WCCI 2008, Hong Kong, China.
- P. Couto, M. Pagola, H. Bustince, E. Barrenechea, P. Melo-Pinto, "Uncertainty in multilevel image thresholding, using Atanassov's Intuitionistic fuzzy sets, WCCI 2008, Hong Kong, China.
- H. Bustince, E. Barrenechea, M. Pagola, R. Orduna, J. Montero, "Special construction of Atanassov's intuitionistic fuzzy S-implications that maintain the Atanassov's intuitionistic index". IWIFSGN 2007. Warsaw, Poland.
- P. Couto, H. Bustince, V. Filipe, E. Barrenechea, M. Pagola, P. Melo-Pinto, "Image Threshold Using A-IFSs Based On Bounded Histograms". IFSA 2007, Cancun, Mexico.
- H. Bustince, M. Pagola, P. Melo-Pinto, E. Barrenechea, P. Couto, R.Orduna, "Representation Of Uncertainty Associated With The Fuzzification Of An Image By Means Of Interval Type 2 Fuzzy Sets. Application To Threshold Computing", Eurofuse 2007. Jaen, Spain
- H. Bustince, E. Barrenechea, M. Pagola, R. Orduna, "Construction Of Interval Type 2 Fuzzy Images To Represent Images In Grayscale. False Edges". Fuzzy IEEE 2007, London, U.K.
- H. Bustince, V. Mohedano , E. Barrenechea & M. Pagola, "An Algorithm For Calculating The Threshold Of An Image Representing Uncertainty Through A-IFSs". IPMU 2006, Paris, France.

- H. Bustince, V. Mohedano , E. Barrenechea & M. Pagola, “A Method For Constructing V. Young’s Fuzzy Subsethood Measures And Fuzzy Entropies” IEEE IS 2006 . Londres, UK.
- H. Bustince, V. Mohedano , E. Barrenechea & M. Pagola, “Proximity Functions. Application to Fuzzy Thresholding”. EUSFLAT 2005, Barcelona, Spain.
- H. Bustince, V. Mohedano , E. Barrenechea & M. Pagola. “Image Thresholding Using Intuitionistic Fuzzy Sets”. IWIFSGN 2005. Warsaw, Poland.

IV. Research experience

National projects in which has participated:

- Project: “Unification, generation, and application of information measures in Interval type 2 fuzzy sets” (spanish: Unificación, generación y aplicación de medidas de información en conjuntos intervalares Tipo 2), TIN2007-65981, October 2007 - October 2010, Grant value: 47.000 €, Principal investigator: H. Bustince.
- Project: “Aplication of interval-valued fuzzy sets to image processing in melanoma diagnosis” (spanish: Aplicación de los conjuntos Intervalo-valorados fuzzy al tratamiento de imágenes de manchas en la piel para diagnosticar melanomas), MTM2005-08982-C04-04, December 2005 - December 2006, Grant value: 4.000 €, Principal investigator: H. Bustince.
- Project: “Intelligent control strategies development applied to trajectory planning and control of autonomous mobile robots” (spanish: Desarrollo de estrategias de control inteligente aplicadas a la generación y control de trayectorias de robots móviles autónomos), DPI2002-03451, 2002 - 2005, Grant value: 18.000 €, Principal investigator: Iñaki Arocena.
- Project: “Property appraisal Valoración de bienes e inmuebles mediante técnicas basadas en inteligencia artificial, Company: Trabajos Catastrales S.A, December 2005 - December 2007, Grant value: 150.000€, Principal investigator: H. Bustince.

International projects:

- Title: Use of fuzzy logic in digital image segmentation models.
Project: HP2006-0128
Period, January 2007-March 2009

VI. International rankings

- h-index (ISI Web of Knowledge): 4

V. Experience in scientific-academic management positions

- Representative of non-PhD staff at the Department “Automatics and Computer Science” of the Public University of Navarra from 2004-Present.
- Representative of non-PhD staff in the works committee at the Public University of Navarra from 2005-Present.

VI. Other scientific activities

- Visiting researcher at Centre for Computational Intelligence, De Monfort University, Leicester, UK. June 2006-September 2006.
- Spanish member of “Integrated research Hispanic-Portuguese actions” between Public University of Navarra and Universidade Trás os Montes e Alto Douro. Grant no. HP2006-0128 Period: January 2007- December 2008
- Member of the organizing committee. Second International Workshop of Artificial Intelligence. Computer Vision, November 30- December 1,2, 2005, Pamplona, Spain.
- Member of the organizing committee. First International Workshop of Artificial Intelligence, April 1,2, 2004, Pamplona, Spain.
- Member of EUSFLAT.
- Referee of different International conferences: EUROFUSE, WCCI, FUZZ IEEE, EUSFLAT.

VII. Teaching experience

- Assistant Lecturer (since 2003-present). Dept. of Automatics and Computer Science, E.T.S. Industriales y de Telecomunicación, Public University of Navarra, Spain.
- He has taught many different subjects in the Computer Science short and long degrees:
 - Algorithmic
 - Artificial Intelligence
 - Computer Vision
 - Introduction to Computer Sciences
 - Management Systems Laboratory

VIII. Areas of interest

Basic concepts of fuzzy sets: Implication operators, aggregation operators, fuzzy measures, fuzzy relations. etc. Extensions of fuzzy sets: Interval-valued fuzzy sets, Atanassov's intuitionistic fuzzy sets, rough fuzzy sets. Approximate reasoning. Fuzzy Image Processing. Applications of soft computing techniques.