

Part A. PERSONAL INFORMATION

CV date 25/10/2021

First and Family name	Humberto Bustince Sola		
Social Security, Passport, ID number	15829354H	Age	61
Researcher codes	WoS Researcher ID (*)	H-4868-2011	
	SCOPUS Author ID(*)	55034746100	
	Open Researcher and Contributor ID (ORCID) **	0000-0002-1279-6195	

(*) At least one of these is mandatory

(**) Mandatory

A.1. Current position

Name of University/Institution	Universidad Pública de Navarra		
Department	Statistics, Computer Science and Mathematics		
Address and Country	Campus Arrosadía s/n, 31006 Pamplona, Spain		
Phone number	+34948169254	E-mail	bustince@unavarra.es
Current position	Full professor	From	01/09/2011
Key words	Aggregation functions; Fuzzy logic; Extensions of fuzzy sets; Deep Learning; Image processing; Classification; Machine learning; Big Data; Computational brain.		

A.2. Education

PhD	University	Year
Mathematical Sciences	Universidad Pública de Navarra	1994

A.3. JCR articles, h Index, thesis supervised...

Number of recognized research terms	4 (last: 2011-2016)
Advised Ph.D thesis	13
Citations (Web of Science)	10354
H index (Web of Science)	54
Highly Cited Researcher	Yes, in 2018
Citations in Scopus	12069
H index	57
Citations in Google Scholar	17854
H index	67
Number of publication in JCR	339
Book chapters	71
Edited books	4
Written books	1
Organized international conferences	7
Contributions to international conferences	231
Contributions to national conferences	63
Editor in chief of international journals	2
Membership to Editorial Boards (JCR)	7 (3 in Q1, 3 in Q3, 1 in Q4)
Edited special issues in Q1 journals	4
Government-funded national research projects	15
Main researcher in	13
Privately-funded research projects	21

Part B. CV SUMMARY (max. 3500 characters, including spaces)

Humberto Bustince Sola is a full professor of Computer Science and Artificial Intelligence at the Public University of Navarra and honorary professor at the University of Nottingham since 2017. He is the main researcher of the Research Group on Artificial Intelligence and Approximate Reasoning, whose research lines are both theoretical (data fusion functions, information and comparison measures, fuzzy sets and their extensions) and applied (Deep learning, image processing, classification, machine learning, data mining, big data or the computational brain). He has led 13 research projects funded by national and regional governments, and two excellence networks on soft computing. He has been the main researcher in projects with companies and entities such as Caja de Ahorros de Navarra, INCITA, Gamesa Tracasa or the Servicio Navarro de Salud. He has taken part in two international projects. He has authored or coauthored more than 300 works, according to Web of Science, including around 160 in Q1 journals. He was a highly cited researcher among the top 1% most relevant scientists in the world in 2018, according to Clarivate Analytics. He collaborates with first line research groups from countries such as United Kingdom, Belgium, Australia, the Czech Republic, Slovakia, Canada or Brasil. He is editor in chief of the Mathware&Soft Computing online magazine of the European Society of Fuzzy Logic and technologies and of the Axioms journal. Associated editor of the IEEE Transactions on Fuzzy Systems journal and member of the editorial boards of the journals Fuzzy Sets and Systems, Information Fusion, International Journal of Computational Intelligence Systems and Journal of Intelligent & Fuzzy Systems. Moreover, he is a coauthor of a book about averaging functions, and has been the co-editor of several books. He has been in charge of organizing several first level international conferences such as EUROFUSE 2009 and AGOP 2013. He is Senior Member of IEEE y Fellow of the International Fuzzy Systems Association (IFSA). Member of the Basque Academy of Sciences, Arts and Literature, Jakiunde, since 2018. He has advised 11 Ph.D thesis.

He was awarded the Cross of Carlos III the Noble by The Government of Navarra in 2017. He got the National Computer Science Prize José García Santesmases in 2019 and the Scientific Excellence Award of EUSFLAT the same year.

Part C. RELEVANT MERITS

C.1. Publications (including books)

- 1- Li-Wei Ko, Yi-Chen Lu, H. Bustince, Yu-Cheng Chang, Y. Chang, J. Fernandez, Yu-Kai Wang, J. A. Sanz, G. P. Dimuro, C.-T. Lin, Multimodal Fuzzy Fusion for Enhancing the Motor-Imagery-Based Brain Computer Interface, IEEE COMPUTATIONAL INTELLIGENCE MAGAZINE, 14, 2019, 96-106, 10/3
- 2- M. Elcano, M. Galar, J. Sanz, H. Bustince, CHI-BD: A Fuzzy Rule-Based Classification System for Big Data classification problems, FUZZY SETS AND SYSTEMS, 348, 2018, 75-101, 4/4
- 3- H. Bustince, J. Fernandez, A. Kolesárová, R. Mesiar, Generation of linear orders for intervals by means of aggregation functions, FUZZY SETS AND SYSTEMS, 220, pp. 69-77, 2013, 4/1.
- 4.- G. Lucca, J. Sanz, G. Dimuro, B. Bedregal, M.J. Asiain, M. Elcano, H. Bustince; CC-integrals: Choquet-like Copula-based aggregation functions and its application in fuzzy rule-based classification systems, KNOWLEDGE-BASED SYSTEMS 119 pp. 32-43, 2017, 7/7
- 5-H. Bustince, M. Galar, B. Bedregal, A. Kolesárová, R. Mesiar, A new approach to interval-valued Choquet integrals and the problem of ordering in interval-valued fuzzy sets applications, IEEE TRANSACTIONS ON FUZZY SYSTEMS, 21, pp. 1150-1162, 2013, 5/1.
- 6- C. Lopez.-Molina, B. De Baets, H. Bustince, J. Sanz, E. Barrenechea, Multiscale edge detection based on Gaussian smoothing and edge tracking, KNOWLEDGE-BASED SYSTEMS, 44, pp. 101-111, 2013, 5/3.
- 7- H. Bustince, M. Pagola, R. Mesiar, E. Hullermeier, F. Herrera, Grouping, Overlap, and Generalized Bientropic Functions for Fuzzy Modeling of Pairwise Comparisons, IEEE TRANSACTIONS ON FUZZY SYSTEMS, 20, pp. 405-415, 2012, 5/2.
- 8- M. Galar; A. Fernandez; E. Barrenechea; H. Bustince; F. Herrera; A Review on Ensembles for the Class Imbalance Problem: Bagging-, Boosting-, and Hybrid-Based Approaches. IEEE

TRANSACTIONS ON SYSTEMS MAN AND CYBERNETICS PART C-APPLICATIONS AND REVIEWS 42 (4) pp. 463-484, 2012, 5/4
9- G. Beliakov, H. Bustince, D.P. Goswami, U.K. Mukherjee, N.R.Pal, On averaging operators for Atanassov's intuitionistic fuzzy sets,, INFORMATION SCIENCES 181, pp. 1116-1124, 2011,5/2
10- J. Sanz, A. Fernandez, H. Bustince, F. Herrera, A genetic tuning to improve the performance of Fuzzy Rule-Based Classification Systems with Interval-Valued Fuzzy Sets: Degree of ignorance and lateral position,INTERNATIONAL JOURNAL OF APPROXIMATE REASONING,52, pp. 751-766, 2011, 4/3

C.2. Research projects and grants

1.-Title: PID2019-108392GB-I00– DATA FUSION TAKING INTO ACCOUNT DISSIMILARITIES AND OTHER RELATIONS BETWEEN THEM, WITH ARTIFICIAL INTELLIGENCE APPLICATION
Funding institution: SPANISH MINISTRY OF ECONOMY AND COMPETITIVITY
Participants: Public University of Navarra
Since: 01/07/2020 until: 30/06/2023
Main researcher: Bustince Sola, Humberto and Fernandez, Javier
Number of researchers: 10
BUDGET: 165.000 €
2.-Title: PRECISION MEDICINE FOR COLORRECTAL CÁNCER: CREATION OF A MULTIVARIABLE REGISTER IN THE COMPUTERIZED CLINICAL HISTORY. HYPOTHESIS FOR THE CREATION OF PROGNOSTIC AND PREDICTIVE ALGORITHMS.
Funding institution: GOVERNMENT OF NAVARRA
Participants: Navarra Biomed,Public University of Navarra
Since: 01/01/2019 until: 31/12/2020
Main researcher: Vera, Ruth
BUDGET: 58.075 €
3.-Title: TIN2016-77356-P – INFORMATION FUSION BASED ON THE OVERLAPPING BETWEEN DATA AND GENERALIZED MONOTONICITIES FOR DESIGNING AND IMPROVING ALGORITHMS IN SOFT COMPUTING PROBLEMS
Funding institution: MINECO
Since: 01/01/2017 until: 31/12/2019
Main researcher: Bustince Sola, Humberto (UPNA)
Budget: 123.500 €
4.-Title: PI-0084/14–DEVELOPMENT OF AN INTELLIGENT SYSTEM TO PREDICT NEGATIVE EVENTS RELATED TO POLIMEDICATION IN PRIMARY MEDICAL CARE IN NAVARRA
Funding institution: GOBIERNO DE NAVARRA
Since: 14/10/2014 until: 14/10/2017
Main researcher: Bustince Sola, Humberto (UPNA)
Budget: 25.531,35 €
5-TIN2013-40765-P: A NEW TOOL FOR INTELLIGENT COMPUTING: AUTOADAPTED AGGREGATION FUNCTIONS IN CLASSIFICATION AND DECISION MAKING PROBLEMS
Funding institution: MICINN
Main researcher: Bustince Sola, Humberto (UPNA)
Since: 01/01/2013 until: 31/12/2015
Budget: 35.025 €
6-Jerónimo de Ayanz program: USE OF FUZZY LOGIC IN DIGITAL IMAGE PROCESSING
Funding institution: Gobierno de Navarra
Since: 01/01/2011 until: 31/12/2011
Main researcher: Bustince Sola, Humberto (UPNA)
Budget: 17.644 €
7-TIN2010-15055 - A NEW MODEL OF INFORMATION REPRESENTATION AND AGGREGATION USING EXTENSIONS OF FUZZY SETS. APPLICATIONS
Funding institution: MICINN
Since: 01/01/2011 until: 31/12/2013
Main researcher: Bustince Sola, Humberto (UPNA)

Budget: 30.492 €

8- TIN2007-65981 - UNIFICATION, GENERATION AND APPLICATION OF INFORMATION MEASURES IN INTERVAL TYPE 2 FUZZY SETS

Funding institution: MEC

Since: 01/10/2007 to: 03/08/2010

Main researcher: Bustince Sola, Humberto (UPNA)

Budget: 56.870,00 €

9.-Title: MTM2005-08982-C04-04 -Application of interval-valued fuzzy sets to the treatment of skin spot images to diagnose melanomes

Funding institution: SPANISH MINISTRY OF EDUCATION AND SCIENCE

Participants: PUBLIC UNIVERSITY OF NAVARRA

Since: 31/12/2005 until: 30/12/2006

Main researcher: Bustince Sola, Humberto

Number of researchers: 4

BUDGET: 4.760,00 €

C.3. Contracts

1- Title: 0011-1365-2017-000096. Design and development of an intelligent system for analyzing, managing, standarizing and improving cleaning services. Gobierno de Navarra- Funding Company: Departamento de Desarrollo Económico- Gobierno de Navarra .

Main researcher: Bustince Sola, Humberto.

Since 01/07/2017 until 30/04/2019.

2-Title: Technical works for improving the image quality

Funding company: Gobierno de Navarra

Main researcher: Humberto Bustince Sola (UPNA);

Since: 30/12/2013, until 29/01/2014

3- Title: HMS-DAMICI-PDR: Health Monitoring System for a Wind Turbine based on Data Mning and Computational Intelligence: Phase PDR

Funding company: GAMESA INNOVATION AND TECHNOLOGY, S.L., UNIPERSONAL

Main researchers: Humberto Bustince Sola (UPNA); Miguel Pagola Barrio (UPNA)

Since: 15/11/2012 , until 06/04/2013

4- Title: Biometrical autentification center

Funding company: INCITA (financiadoCDTI)

Since: 01/10/2011 until: 01/10/2013

Main researcher: H. Bustince (UPNA)

5- Title: Formalization, validation and optimization of the methodology used for controlling economic groups

Funding company: CAJA DE AHORROS Y MONTE DE PIEDAD DE NAVARRA (CAN)

Since: 28/07/2009 until: 28/07/2010

Main researcher: H. Bustince (UPNA)

6- Title: Data mining and soft computing techniques for improving the quality of data included in scoring.

Funding company: CAJA DE AHORROS Y MONTE DE PIEDAD DE NAVARRA (CAN)

Since: 18/03/2009 until: 30/01/2010

Main researcher: H. Bustince (UPNA)

C.4. Awards

1- National Computer Science Prize José García Santesmases in 2019

2- Scientific Excellence Award of the European Society of Fuzzy Logic and technologies, EUSFLAT, in 2019 the same year,

3- The work "A new approach to interval-valued Choquet integrals and the problem of ordering in interval-valued fuzzy sets applications" was chosen as the paper published in the journal IEEE Transactions on Fuzzy Systems in 2013. At that time, this journal had the highest impact factor among engineering journals.

4- The work "Convolution on bounded lattices" was awarded as the best student paper in the EUSFLAT Conference held at Warsaw in September, 2017.

5- Research award of the Public University of Navarra in the areas of Exact, Biological, Medical and Technological Sciences in 2015, recognizing the full research record of the awardee.

6.- Fellow de IFSA (International Fuzzy Systems Association) desde 2015.



7.-The Ph. D. thesis La tesis A new class of fuzzy subsethood measures, by the student Héliida Salles was awarded with the 3rd prize in the XI Contest of Thesis and Dissertations about Artificial Intelligence, CTDIAC 2018, held at Sao Paulo in 2018.

C.6. Others

- 1- Member of Jakiunde (Basque Academy of Sciences, Arts and Literature) since april 20, 2018.
- 2.-Carlos III the Noble Cross awarded by the Government of Navarra in 2017. This is the highest civil recognition in Navarra.
- 3.- Honorary profesor in Computer Science at the University of Nottingham since 2017.
- 4- Highly Cited Researcher according to Clarivate Analytics classification of December 2018..