



Francisco José Fumero Batista

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**Francisco José Fumero Batista**

Surname(s): **Fumero Batista**
 Name: **Francisco José**
 DNI: **45731321F**
 Date of birth: **24/01/1984**
 Gender: **Male**
 Nationality: **Spain**
 Country of birth: **Spain**
 Contact province: **Santa Cruz de Tenerife**
 Contact address: **Calle Volcán Cañas Dulces, nº7, 1ºC**
 Postcode: **38108**
 Contact country: **Spain**
 Contact aut. region/reg.: **Canary Islands**
 Contact city: **La Laguna**
 Email: **ffumerob@ull.es**
 Mobile phone: **(34) 686 84 54 63**

Current professional situation

Employing entity: University of La Laguna **Type of entity:** University

Department: Faculty of Mathematics and Physics

Professional category: Research fellow (FPU)

Start date: 01/04/2013

Type of contract: Temporary employment contract **Dedication regime:** Full time

Performed tasks: - Research grant to develop a PhD Thesis, funded by the Spanish Ministry of Education - Thesis title: Design and implementation of segmentation and object detection algorithms in medical images. Application to fundus images. - Main activities: · Image processing and segmentation of natural and medical images · Medical image analysis · Multi-atlas registration-based segmentation of medical images · Generation of ground truth · Evaluation of image segmentation algorithms

Identify key words: Medical computing; Medical images; Image segmentation; Image processing

Previous positions and activities

	Employing entity	Professional category	Start date
1	Universidad de La Laguna	Researcher	01/06/2010
2	N2B Solutions S.L.	Programmer analyst	01/11/2009
3	Teneinformática Software S.L.	Programmer	20/08/2007

1 **Employing entity:** Universidad de La Laguna **Type of entity:** University

Department: Systems Engineering and Automation, Escuela Técnica Superior de Ingeniería Civil e Industrial

Professional category: Researcher

Start-End date: 01/06/2010 - 30/11/2012 **Duration:** 2 years - 6 months

Type of contract: Temporary employment contract



Dedication regime: Part time

Performed tasks: - Research on the field of biomedical engineering - Design of image segmentation algorithms - Analysis and processing of medical images - Special focus on color fundus images (retinal images)

Identify key words: Medical computing; Medical images; Image segmentation; Image processing

2 Employing entity: N2B Solutions S.L.

Type of entity: Business

Professional category: Programmer analyst

Start-End date: 01/11/2009 - 15/12/2009

Duration: 1 month - 15 days

Performed tasks: - Feasibility analysis of the integration of an electronic signature and timestamping system in the application of the company - PHP and JavaScript programming

3 Employing entity: Teneinformática Software S.L. **Type of entity:** Business

Professional category: Programmer

Start-End date: 20/08/2007 - 04/09/2008

Duration: 1 year - 15 days

Performed tasks: - Development of ERP and CRM software - Delphi, SQL and PL/SQL programming



Education

University education

1st and 2nd cycle studies and pre-Bologna degrees

- 1 **Name of qualification:** M.Sc., Research, Development and Innovation in Science and Engineering
Degree awarding entity: Universidad de La Laguna **Type of entity:** University
Date of qualification: 17/09/2012
Average mark: Outstanding
Prize: Best Student Record
- 2 **Name of qualification:** B.Sc., Informatics Engineering
Degree awarding entity: Universidad de La Laguna **Type of entity:** University
Date of qualification: 30/09/2011
Average mark: Excellent
Prize: End of degree award
- 3 **Name of qualification:** B.Sc., Computer Science (Systems Engineering)
Degree awarding entity: Universidad de La Laguna **Type of entity:** University
Date of qualification: 15/12/2008
Average mark: Excellent
Prize: Third Best Student Record

Doctorates

Doctorate programme: Ph.D. candidate (Engineering Physics)

Specialised, lifelong, technical, professional and refresher training (other than formal academic and healthcare studies)

- 1 **Training title:** Tools for Peer Evaluation
Awarding entity: University of La Laguna **Type of entity:** University
End date: 29/01/2016 **Duration in hours:** 8 hours
- 2 **Training title:** Introduction to University Teaching
Awarding entity: University of La Laguna **Type of entity:** University
End date: 15/10/2015 **Duration in hours:** 30 hours
- 3 **Training title:** English for Academic Writing
Awarding entity: Servicio de Idiomas de la Universidad de La Laguna **Type of entity:** Foundation
End date: 15/03/2014 **Duration in hours:** 30 hours



- 4 Training title:** English B2.3
Awarding entity: Servicio de Idiomas de la Universidad de La Laguna **Type of entity:** Foundation
End date: 16/01/2012 **Duration in hours:** 50 hours
- 5 Training title:** Academic Presentations in English
Awarding entity: Servicio de Idiomas de la Universidad de La Laguna **Type of entity:** Foundation
End date: 06/07/2011 **Duration in hours:** 25 hours
- 6 Training title:** English B2.2
Awarding entity: Servicio de Idiomas de la Universidad de La Laguna **Type of entity:** Foundation
End date: 22/05/2011 **Duration in hours:** 50 hours
- 7 Training title:** English B2.1
Awarding entity: Servicio de Idiomas de la Universidad de La Laguna **Type of entity:** Foundation
End date: 19/01/2011 **Duration in hours:** 50 hours

Language skills

Language	Listening skills	Reading skills	Spoken interaction	Speaking skills	Writing skills
French	A1	A1	A1	A1	A1
English	C1	C1	B2	B2	B2

Teaching experience

General teaching experience

- 1 Type of teaching:** Official teaching
Name of the course: Human Computer Interaction
Type of teaching: Laboratory work
University degree: Degree on Informatics Engineering
Course given: 3
Start date: 20/10/2015 **End date:** 20/12/2015
Type of hours/ ECTS credits: Hours
Hours/ECTS credits: 30
Entity: Universidad de La Laguna **Type of entity:** University
Faculty, institute or centre: Escuela Superior de Ingeniería y Tecnología
Subject language: Spanish
- 2 Type of teaching:** Official teaching
Name of the course: Human Computer Interaction
Type of teaching: Laboratory work
University degree: Degree on Informatics Engineering
Course given: 3



Start date: 20/10/2014

End date: 20/12/2014

Type of hours/ ECTS credits: Hours

Hours/ECTS credits: 30

Entity: Universidad de La Laguna

Type of entity: University

Faculty, institute or centre: Escuela Superior de Ingeniería y Tecnología

Subject language: Spanish

3 Type of teaching: Official teaching

Name of the course: Human Computer Interaction

Type of teaching: Laboratory work

University degree: Degree on Informatics Engineering

Course given: 3

Start date: 20/10/2013

End date: 20/12/2013

Type of hours/ ECTS credits: Hours

Hours/ECTS credits: 30

Entity: Universidad de La Laguna

Type of entity: University

Faculty, institute or centre: Escuela Técnica Superior de Ingeniería Informática

Subject language: Spanish

4 Type of teaching: Official teaching

Name of the course: Principles of Computers

Type of teaching: Laboratory work

University degree: Degree on Informatics Engineering

Course given: 1

Start date: 18/02/2016

Type of hours/ ECTS credits: Hours

Hours/ECTS credits: 15

Entity: Universidad de La Laguna

Type of entity: University

Faculty, institute or centre: Escuela Superior de Ingeniería y Tecnología

Subject language: Spanish

Experience supervising doctoral thesis and/or final year projects

1 Project title: Entorno de depuración de algoritmos de procesamiento de imágenes para Java (codirector)

Entity: Universidad de La Laguna

Type of entity: University

Student: Pedro Javier Núñez Rodríguez

Date of reading: 23/07/2015

2 Project title: Instrumento musical controlado mediante visión por computador (codirector)

Entity: Universidad de La Laguna

Type of entity: University

Student: Fernando González López-Peñalver

Date of reading: 21/07/2015

3 Project title: Aplicación web para crear segmentaciones de referencia de imágenes del nervio óptico (codirector)

Entity: Universidad de La Laguna

Type of entity: University

Student: Erasmo Castañeda Sánchez

Date of reading: 13/07/2015



- 4 Project title:** Mejora de las prestaciones de una aplicación de segmentación semiautomática de imágenes (codirector)
Entity: Universidad de La Laguna **Type of entity:** University
Student: Sergio Jesús García Llarena
Date of reading: 06/2013

Healthcare experience

Other activities/achievements not included above

- 1 Other relevant activities:** Master Student's Representative on the Committee on Postgraduate Studies
Entity where project took place: Universidad de La Laguna **Type of entity:** University
- 2 Other relevant activities:** Students Representative on the Board of the Department of Systems Engineering and Automation and Architecture and Computer Technology (ISAATC)
Entity where project took place: Universidad de La Laguna **Type of entity:** University

Scientific and technological experience

Research and development groups/teams

Name of the group: Computers and Control
Aims of the group: Systems Engineering and Automation
Name of principal investigator: Evelio José González **Number of members in the group:** 28
Type of collaboration: Co-authorship of publications
City of group: San Cristóbal de La Laguna, Canary Islands, Spain
Affiliation entity: Universidad de La Laguna **Type of entity:** University
Number of directed thesis: 14
Start date: 01/06/2010

Scientific or technological activities

R&D projects funded through competitive calls of public or private entities

- 1 Name of the project:** Aplicaciones de la medida de hemoglobina papilar: neuritis óptica isquémica y relación morfología-función en el glaucoma
Entity where project took place: Universidad de La Laguna **Type of entity:** University
Name principal investigator (PI, Co-PI...): Silvia Alayón Miranda
Funding entity or bodies: Ministerio de Ciencia e Innovación (cofinanciado con fondos FEDER)
City funding entity: Spain



Type of participation: Team member

Code according to the funding entity: PI12/02301

Start-End date: 01/01/2013 - 31/12/2016

Duration: 3 years

2 Name of the project: Medida Topográfica de la Perfusión del Nervio Óptico y Aplicación al Estudio del Glaucoma

Entity where project took place: Universidad de La Laguna **Type of entity:** University

Name principal investigator (PI, Co-PI...): José Francisco Sigut Saavedra

Funding entity or bodies:

Ministerio de Ciencia e Innovación (cofinanciado con fondos FEDER)

City funding entity: Spain

Type of participation: Team member

Code according to the funding entity: PI09/90632

Start-End date: 01/01/2010 - 31/12/2012

Total amount: 53.482

Scientific and technological activities

Scientific production

Publications, scientific and technical documents

1 María Bambo; Elena García Martín; Susana Pérez Olivan; José Francisco Sigut Saavedra; Francisco José Fumero Batista; Juan Fuentes; Jose Ara; Jesús Martín; Jose Larrosa; Manuel González de la Rosa. Diagnostic ability of a new method for measuring hemoglobin levels in the optic nerve head in multiple sclerosis patients. British Journal of Ophthalmology. 97, pp. 1543 - 1548. BMJ, 30/09/2013. ISSN 0007-1161

Type of production: Scientific paper

Format: Journal

Impact source: ISI

Category: Ophthalmology

Impact index in year of publication: 2,725

Journal in the top 25%: Yes

Position of publication: 9

No. of journals in the cat.: 58

Relevant publication: Yes

2 Erica Medina-Mesa; Marta Gonzalez-Hernandez; Jose Sigut; Francisco Fumero-Batista; Cristina Pena-Betancor; Silvia Alayon; Manuel Gonzalez de la Rosa. Estimating the Amount of Hemoglobin in the Neuroretinal Rim Using Color Images and OCT. Current Eye Research. pp. 1 - 8. 23/09/2015. Available on-line at: <<http://dx.doi.org/10.3109/02713683.2015.1062112>>.

Type of production: Scientific paper

Format: Journal

Impact source: ISI

Impact index in year of publication: 1.639

3 Cristina Peña Betancor; Marta González Hernández; Francisco José Fumero Batista; José Francisco Sigut Saavedra; Erica Medina Mesa; Silvia Alayón Miranda; Manuel González de la Rosa. Estimation of the Relative Amount of Hemoglobin in the Cup and Neuroretinal Rim Using Stereoscopic Color Fundus Images. Investigative Ophthalmology & Visual Science. 56 - 3, pp. 1562 - 1568. Association for Research in Vision and Ophthalmology, 03/01/2015.

Type of production: Scientific paper

Format: Journal



- 4** José Francisco Sigut Saavedra; Francisco José Fumero Batista; Omar Núñez Regalado; Marta Sigut Saavedra. Automatic marker generation for watershed segmentation of natural images. *Electronics Letters*. 50 - 18, pp. 1281 - 1283. Institution of Engineering and Technology, 29/08/2014.
Type of production: Scientific paper **Format:** Journal
- 5** Silvia Alayón Miranda; Manuel González de la Rosa; Francisco José Fumero Batista; José Francisco Sigut Saavedra; José Luis Sánchez de la Rosa. Variabilidad entre expertos al delimitar el borde y área papilar. *Archivos de la Sociedad Española de Oftalmología*. 88 - 5, pp. 168 - 173. Elsevier, 01/05/2013.
Type of production: Scientific paper **Format:** Journal
- 6** Manuel Gonzalez de la Rosa; Marta Gonzalez Hernandez; Carmen Mendez Hernandez; Elena Garcia Martin; Francisco Fumero Batista; Silvia Alayon Miranda; Jose Sigut. Measuring Hemoglobin Levels in the Optic Nerve Head for Glaucoma Management. *Glaucoma Imaging*. pp. 265 - 280. Springer International Publishing, 2016. ISBN 978-3- 319-18958- 1
DOI: 10.1007/978-3- 319-18959- 8_10
Type of production: Book chapter

Works submitted to national or international conferences

- 1** **Title of the work:** Interactive Tool and Database for Optic Disc and Cup Segmentation of Stereo and Monocular Retinal Fundus Images
Name of the conference: WSCG'2015 - 23rd International Conference in Central Europe on Computer Graphics, Visualization and Computer Vision'2015
Corresponding author: Yes
City of event: Pilsen, Czech Republic
Date of event: 08/06/2015
End date: 12/06/2015
Organising entity: University of West Bohemia - Winter School of Computer Graphics (WSCG) **Type of entity:** University
Type of contribution: Scientific paper
 Francisco José Fumero Batista; José Francisco Sigut Saavedra; Silvia Alayón Miranda; Marta González Hernández; Manuel González de la Rosa. ISBN 978-80-86943-66-4
- 2** **Title of the work:** Over- and Under-Segmentation Evaluation based on the Segmentation Covering Measure
Name of the conference: WSCG'2015 - 23rd International Conference in Central Europe on Computer Graphics, Visualization and Computer Vision'2015
Corresponding author: No
City of event: Pilsen, Czech Republic
Date of event: 08/06/2015
End date: 12/06/2015
Organising entity: University of West Bohemia - Winter School of Computer Graphics (WSCG) **Type of entity:** University
Type of contribution: Scientific paper
 José Francisco Sigut Saavedra; Francisco José Fumero Batista; Omar Núñez Regalado. ISBN 978-80-86943-66-4
- 3** **Title of the work:** Evaluación de métodos de segmentación de propósito general sobre imágenes de fondo de ojo
Name of the conference: XXXIV Jornadas de Automática
City of event: Terrassa, Catalonia, Spain
Date of event: 04/09/2013



End date: 06/09/2013

Organising entity: COMITE ESPAÑOL DE AUTOMATICA DE LA IFAC

Omar Núñez Regalado; Francisco José Fumero Batista; José Francisco Sigut Saavedra; Silvia Alayón Miranda.

- 4** **Title of the work:** MRSeg - Herramienta interactiva para generar segmentaciones de referencia de imágenes médicas
Name of the conference: XXXIV Jornadas de Automática
City of event: Terrassa, Catalonia, Spain
Date of event: 04/09/2013
End date: 06/09/2013
Organising entity: COMITE ESPAÑOL DE AUTOMATICA DE LA IFAC
Francisco José Fumero Batista; Sergio Jesús García Llarena; Omar Núñez Regalado; José Francisco Sigut Saavedra; Silvia Alayón Miranda.
- 5** **Title of the work:** simLab: Laboratorio de simulación de la planta Festo
Name of the conference: XXXIV Jornadas de Automática
City of event: Terrassa, Catalonia, Spain
Date of event: 04/09/2013
End date: 06/09/2013
Organising entity: COMITE ESPAÑOL DE AUTOMATICA DE LA IFAC
Silvia Alayón Miranda; Norena Martín; Omar Núñez Regalado; Francisco José Fumero Batista.
- 6** **Title of the work:** MobiDerm: UNA APLICACIÓN PARA MÓVILES PARA EL SEGUIMIENTO DE LA EVOLUCIÓN DE LUNARES Y OTRAS ALTERACIONES DERMATOLÓGICAS
Name of the conference: XXXIII Jornadas de Automática
City of event: Vigo, Galicia, Spain
Date of event: 05/09/2012
End date: 07/09/2012
Organising entity: COMITE ESPAÑOL DE AUTOMATICA DE LA IFAC
José Francisco Sigut Saavedra; Silvia Alayón Miranda; Monika Daniela Jarysz Chodowiecki; Adrián Brito Pacheco; José Luis Sánchez de la Rosa; Francisco José Fumero Batista; Vanesa Muñoz Cruz; Lorenzo Moreno Ruiz.
- 7** **Title of the work:** Método General de Segmentación de Imágenes Basado en una Distancia Pseudométrica para Definir Vecindarios de Píxeles
Name of the conference: XXXIII Jornadas de Automática
City of event: Vigo, Galicia, Spain
Date of event: 05/09/2012
End date: 07/09/2012
Organising entity: COMITE ESPAÑOL DE AUTOMATICA DE LA IFAC
José Francisco Sigut Saavedra; Francisco José Fumero Batista; Silvia Alayón Miranda; Manuel González de la Rosa; Marta González Hernández; José Luis Sánchez de la Rosa; Lorenzo Moreno Ruiz.
- 8** **Title of the work:** Correlation between the concentration of hemoglobin in the optic nerve head and various morphological and functional indicators
Name of the conference: 20th International Visual Field and Imaging Symposium
City of event: Melbourne, Australia
Date of event: 22/01/2012
End date: 25/01/2012
Organising entity: Imaging and Perimetry Society (IPS)



Marta Gonzalez-Hernandez; Francisco José Fumero Batista; Nathan Radcliffe; Julian Garcia-Feijoo; Isabel Fuentes-Lazaro.

9 Title of the work: Variabilidad entre expertos en la delimitación del borde papilar y respecto al OCT-Cirrus en la medida de su área

Name of the conference: 87 Congreso de la Sociedad Española de Oftalmología

City of event: Oviedo, Principality of Asturias, Spain

Date of event: 21/09/2011

End date: 24/09/2011

Organising entity: Sociedad Española de Oftalmología (SEO)

Silvia Alayón Miranda; Manuel González de la Rosa; Francisco José Fumero Batista; José Francisco Sigut Saavedra; José Luis Sánchez de la Rosa.

10 Title of the work: RIM-ONE: Base de datos de retinografías para la evaluación de métodos de segmentación del nervio óptico

Name of the conference: XXXII Jornadas de Automática

City of event: Sevilla, Andalusia, Spain

Date of event: 07/09/2011

End date: 09/09/2011

Organising entity: Comité Español de Automática (CEA)

Francisco José Fumero Batista; Silvia Alayón Miranda; José Luis Sánchez de la Rosa; José Francisco Sigut Saavedra; Marta González-Hernández. "RIM-ONE: Base de datos de retinografías para la evaluación de métodos de segmentación del nervio óptico".

11 Title of the work: RIM-ONE: An Open Retinal Image Database for Optic Nerve Evaluation

Name of the conference: The 24th International Symposium on Computer-Based Medical Systems (CBMS 2011)

City of event: Bristol, United Kingdom

Date of event: 27/06/2011

End date: 30/06/2011

Organising entity: University of the West of England **Type of entity:** University

City organizing entity: Bristol, United Kingdom

Francisco José Fumero Batista; Silvia Alayón Miranda; José Luis Sánchez de la Rosa; José Francisco Sigut Saavedra; Marta González Hernández. "RIM-ONE: An Open Retinal Image Database for Optic Nerve Evaluation".

12 Title of the work: Publication and Reuse of Open Government Data. A practical approach.

Name of the conference: 7th International Conference on Web Information Systems and Technologies (WEBIST)

City of event: Noordwijkerhout, Holland

Date of event: 06/05/2011

End date: 09/05/2011

Tanausú Cerdeña Hernández; Francisco José Fumero Batista; Luz Marina Moreno de Antonio; Daniel Pérez Barbudo; José Luis Roda García.



R&D management and participation in scientific committees

Organization of R&D activities

- 1** **Title of the activity:** Interaccion 2014
Type of activity: International Conference
City of event: Puerto de la Cruz,
Convening entity: University of La Laguna **Type of entity:** University
City convening entity: La Laguna, Canary Islands, Spain
Start-End date: 10/09/2014 - 12/09/2014
- 2** **Title of the activity:** Fair of dissemination of the research of the University of La Laguna
Type of activity: Popular Scientific Fair
Convening entity: Doctorate Students of the University of La Laguna **Type of entity:** Associations and Groups
Start-End date: 16/12/2012 - 16/12/2012 **Duration:** 1 day

Other achievements

Stays in public or private R&D centres

Entity: Computational Radiology Laboratory **Type of entity:** Healthcare Institutions
Faculty, institute or centre: Boston Children's Hospital
City of entity: Boston, United States of America
Start-End date: 05/06/2014 - 02/09/2014 **Duration:** 3 months
Goals of the stay: Predoctoral Stay
Provable tasks: Segmentation of fundus images using multi-atlas registration-based methods