Andrés Marrugo

Curriculum Vitæ

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Personal Information

Full Name:	Andrés Guillermo Marrugo Hernández
Passport No.:	CC73006735
Gender:	Male
Nationality:	Colombian
Birth Date:	October 28th, 1984.
Place of birth:	Cartagena, Colombia.
Marital status:	Married.

Education

2008-2013 **Ph.D. in Optical Engineering**, *Universidad Politécnica de Cataluña*, Barcelona, Spain, *Cum laude*.
Thesis title: "Retinal image analysis: image processing and feature extraction."

2008-2009 **M.Sc. in Photonics**, *Universidad Politécnica de Cataluña*, Barcelona, Spain, *9.8/10*.
Thesis title: "Image analysis algorithms for feature extraction in eye fundus images"

2003-2008 **B.E. in Mechatronics Engineering**, *Universidad Tecnológica de Bolívar*, Cartagena, Colombia, *5.0/5.0*.
Thesis title: "Guava fruit ripening optic inspection system by means of digital image analysis"

Awards and Scholarships

2012 Honors Diploma: Young Researchers, Spanish Optical Society.

2009 FPU doctoral scholarship, Spanish Ministerio de Educación.

2008 Laureate Undergraduate Thesis, Universidad Tecnológica de Bolívar.

2008 Egresado de Honor: Premio Alcatraz de Oro, Universidad Tecnológica de Bolívar.

2008 Summa Cum Laude, Universidad Tecnológica de Bolívar.

Experience

Jan 2014 – present **Assistant Professor**, *Faculty of Engineering*, Universidad Tecnológica de Bolívar, Colombia.

May 2013 – Dec 2013 **Assistant Professor**, *Faculty of Basic Sciences*, Universidad Tecnológica de Bolívar, Colombia.

Sep 2008 – Feb 2013 **Research Assistant**, *Grupo de Óptica Aplicada y Procesado de Imagen*, Universitat Politècnica de Catalunya, Spain.

Jul 2007 – Dec 2007 **Research Assistant - Intern**, *Grupo de Química Cuántica y Teórica*, Universidad de Cartagena, Colombia.

Jan 2005 – May 2007 **Teacher Assistant**, *Physics Department*, Universidad Tecnológica de Bolívar, Colombia.

Participation in R+D projects

Jun 2014 – May 2017 **Sistemas de profundidad de foco extendida y lentes intraoculares multifocales para la salud visual**, funded by Ministerio de Economía y Competitividad (Spain). Universidad Politécnica de Cataluña.

Jan 2010 – Dec 2012 **Procesado de la información óptica con aplicaciones a la industria, la salud visual y la seguridad**, funded by Ministerio de Ciencia e Innovación (Spain), Plan Nacional de Diseño y Producción Industrial. Fondos FEDER, Universidad Politécnica de Cataluña.

Oct 2008 – Sep 2009 **Dispositivos y procesadores para la interacción avanzada entre sistemas de visión humana y visión artificial**, funded by Ministerio de Educación y Ciencia (MEC, convocatoria 2006, Spain), Plan Nacional de Diseño y Producción Industrial. Fondos FEDER, Universidad Politécnica de Cataluña.

Research Stays

May 2010 – Aug 2010 **Retinal image restoration**, *Image Processing Department*, Institute of Information Theory and Automation, Czech Academy of Science, Prague, Czech Republic.

Nov 2009 – Dec 2009 **Image quality estimation**, *Grupo de Modelado de Visión y Procesado de Imagen*, Instituto de Óptica, Consejo Superior de Investigaciónes Científicas, Madrid, Spain.

Publications

Invited Technical Articles

Andrés G Marrugo, María S Millan, Gabriel Cristóbal, Salvador Gabarda, Michal Sorel, and Filip Sroubek. Toward computer-assisted diagnosis and telemedicine in ophthalmology. *SPIE Newsroom*, (doi: 10.1117/2.1201205.004256), 2012.

Journal Articles

Andrés G Marrugo and María S Millan. Retinal Image Analysis Oriented to the Clinical Task. *Electronic Letters on Computer Vision and Image Analysis*, 13(2):54–55, 2014.

Andrés G Marrugo, María S Millán, Michal Sorel, and Filip Sroubek. Restoration of retinal images with space-variant blur. *Journal of Biomedical Optics*, 19(1):016023, 2014.

Andrés G Marrugo, María S Millan, Gabriel Cristóbal, Salvador Gabarda, and Héctor C Abril. Anisotropy-based robust focus measure for non-mydriatic retinal imaging. *Journal of Biomedical Optics*, 17(7):076021, 2012.

Andrés G Marrugo, Michal Sorel, Filip Sroubek, and María S Millan. Retinal image restoration by means of blind deconvolution. *Journal of Biomedical Optics*, 16(11):116016, Nov 2011.

Andrés G Marrugo and María S Millan. Retinal image analysis: preprocessing and feature extraction. *Journal of Physics: Conf. Series*, 274(1):012039, 2011.

Andrés G Marrugo and María S Millan. Optic disc segmentation in retinal images. *Opt. Pura Apl.*, 43(2):79–86, May 2010.

Ricardo Vivas-Reyes, Luz Mercado, Jorge Anaya-Gil, Andrés G Marrugo, and Emiliano Martinez. Theoretical study to evaluate polyfuran electrical conductivity

and methylamine, methoxy substituent effects. *Journal of Molecular Structure: THEOCHEM*, 861(1-3):137–141, 2008.

Peer Reviewed Conference Proceedings

Andrés G Marrugo, María S Millan, Michal Sorel, Jan Kotera, and Filip Sroubek. Improving the blind restoration of retinal images by means of point-spread-function estimation assessment. In Eduardo Romero and Natasha Lepore, editors, *Tenth International Symposium on Medical Information Processing and Analysis*, page 92871D. SPIE, January 2015.

Andrés G Marrugo, María S Millan, and H C Abril. Implementation of an image based focusing algorithm for non-mydriatic retinal imaging. In *Engineering Mechatronics and Automation (CIIMA), 2014 III International Congress of*, Cartagena, Colombia, October 2014. IEEE.

W Marrugo, E Sierra, J Marrugo, C Camacho, L A Romero, and Andrés G Marrugo. A vision-based system for the dynamic measurement of in-plane displacements. In *Engineering Mechatronics and Automation (CIIMA), 2014 III International Congress of*. IEEE, October 2014.

Andrés G Marrugo, María S Millán, Sorel Michal, and Sroubek Filip. Blind restoration of retinal images degraded by space-variant blur with adaptive blur estimation. In *8th Ibero-American Conference on Optics 11th Latin-American Meeting on Optics, Lasers and Applications (RIAO)*, Porto, July 22–26 2013.

Andrés G Marrugo, María S Millan, Gabriel Cristóbal, Salvador Gabarda, Michal Sorel, and Filip Sroubek. Image analysis in modern ophthalmology: from acquisition to computer assisted diagnosis and telemedicine **Invited Paper**. In *SPIE Photonics Europe, Proceedings SPIE*, volume 8436, page 84360C, July 2012.

Andrés G Marrugo, María S Millan, and Héctor C Abril. Implementation of an Image Based Focusing Algorithm for Retinal Imaging. In *X Reunión Nacional de Óptica*, pages 40–43, Zaragoza, 2012.

Andrés G Marrugo, María S Millan, Gabriel Cristóbal, Salvador Gabarda, and H C Abril. No-reference Quality Metrics for Eye Fundus Imaging. *CAIP'11, Lecture Notes in Computer Science*, 6854:486–493, 2011.

Andrés G Marrugo, Filip Sroubek, Michal Sorel, and María S Millan. Multichannel blind deconvolution in eye fundus imaging. In *ISABEL '11-Proceedings of the 4th International Symposium on Applied Sciences in Biomedical and Communication Technologies*, pages 7:1–7:5. New York, NY, USA, 2011.

Andrés G Marrugo and María S Millan. Efectos de Compresión en Imágenes de la Retina Para la Evaluación del Riesgo Glaucomatoso. In *IX Reunión Nacional de Óptica*, page 140, Orense (Spain), September 2009.

Language Knowledge

Spanish: Native

English: Excellent (Toefl: 111/120)

French: Basic (Delf A6)

Computer Skilss

Programming languages:	C/C++, VHDL, also Matlab/Simulink, Octave, Maple, LaTeX.
Software:	Solid Edge (CAD/CAM), Gaussian, Pspice, Git.
Operating systems:	Linux, MS Windows, and Mac OS X.

Scientific Societies

- Spanish Optical Society (SEDOPTICA)
- European Optical Society (EOS)
- International Society for Optics and Photonics (SPIE)
- Institute of Electrical and Electronics Engineers (IEEE)