

MARTA PENAS CENTENO

(marta.penas.centeno@gmail.com)

EDUCATION

PhD, Computer Science and Engineering - *University of A Coruña, 2005.*

Thesis: Perceptual Grouping Techniques for the Detection of Objects in Digital Images.

Advisors: Manuel F. González Penedo and María José Carreira Nouche.

Diploma of Advanced Studios (equivalent to MS) – *University of A Coruña, 2002.*

B.Tech, Computer Engineering – *University of A Coruña, 2000.*

Graduated with honors

AWARDS AND HONORS

Post-doctoral fellowship by the Ministry of Science and Education of Spain (2007 – 2009).

PhD student fellowship by the Xunta de Galicia (2002 – 2005).

Undergraduate Scholarship (1994 – 2000).

PROFESIONAL EXPERIENCE

Assistant Professor, University of A Coruña

October 2009 – Present

Assistant Lecturer, University of A Coruña

April 2005 – October 2009

Taught a range of courses to PhD and B. Tech students. Topics covered include artificial intelligence, neural networks, functional programming, data structures, and computer vision.

Supervised several research projects in computer vision.

Post-doctoral fellow, University of Washington

November 2007 – May 2009

Designed and implemented a novel method for detecting regions of interest in color images. For a broad class of images, my method is both more robust and outperforms the state-of-the-art for scene matching and image annotation.

Designed and implemented a novel methodology for building flexible (non-binary) taxonomies for image categorization. My taxonomies significantly improve the precision of categorization with minimal loss in efficiency.

Research Assistant, University of A Coruña

October 2002 – March 2005

Designed and implemented a fully automatic framework for object detection based on perceptual grouping techniques. The framework combines powerful low-level techniques and works on a broad range of input images. It has been successfully applied to both building and protein crystallization detection.

Co-designed a distributed application for biometric authentication in high security environments. Because the application is based on the blood vessel pattern in the retina, it is extremely accurate.

Teaching assistant in: *Data Structures* and *Neural Networks*.

Software Engineer, University of A Coruña

June 2002 – September 2002

Implemented a web application for managing information on the distribution of housing in the municipality of A Coruña.

Software Engineer, University of A Coruña

February 2000 – December 2001

Co-designed and implemented a system for automatically measuring the arterial-venous speed in angiography retinal images.

Junior Software Engineer, SOFTGAL

June 1999 – December 1999

Implemented and maintained banking applications in the areas of *Trade Papers* and *Commercial Loans*.

RESEARCH INTERESTS

Computer vision, pattern recognition, image annotation and retrieval, and medical image analysis.

PROGRAMING LANGUAGE SKILLS

Proficiency in C++, C and Matlab. Experienced in Java, Ocaml, Pascal and Perl.

PUBLICATIONS

- S. G. Vázquez, N. Barreira, M. Penas, M. G. Penedo, A. Pose-Reino. "Automatic Classification of Retinal Vessels into Arteries and Veins". IASTED International Conference on Biomedical Engineering (*BioMed 2010*), 2010.
- M. Penas, L. G. Shapiro. "A color based interest operator". *15th International Conference on Image Analysis and Processing (ICIAP 2009)*, 2009.
- M. Penas, M. G. Penedo, M. J. Carreira. "A neural network based framework for directional primitive extraction". *Neural Processing Letters*, 27 (1): 67-83, 2008.
- J. Rouco, M. Penas, A. Mosquera, M. G. Penedo, N. Barreira. "Extraction of salient texture regions using Active Nets ". *9th International Conference on Pattern Recognition and Image Analysis: New Information Technologies (PRIA-9)*, 2008.
- J. Rouco, M. Penas, M. G. Penedo, M. Ortega, C. Alonso-Montes, "Certainty Measure of Pairwise Line Segment Perceptual Relations using Fuzzy Logic". *12th Iberoamerican Conference on Pattern Recognition (CIARP 2007)*, 2007.
- M. Penas, M. J. Carreira, M. G. Penedo, N. Barreira. "Comparison of Alternative Frameworks for Directional Primitive Extraction". *Pattern Recognition and Image Analysis*, 17(4): 439-449, 2007.
- S. Pan, G. Shavit, M. Penas, D. Xu, L. Shapiro, R. Ladner, E. Riskin, W. Hol, D. Meldrum. "Automated classification of protein crystallization images using support vector machines with scale-invariant texture and Gabor features". *Acta Crystallographica Section D*, D62: 271-279, 2006.
- M. Blanco, M. G. Penedo, N. Barreira, M. Penas, M. J. Carreira. "Localization and extraction of the Optic Disc using the Fuzzy Circular Hough Transform". *8th International Conference on Artificial Intelligence and Soft Computing (ICAISC 2006)*, 2006.
- C. Mariño, M. G. Penedo, M. Penas, M. J. Carreira, F. González. "Personal authentication using digital retinal images". *Pattern Analysis and Applications*, 9: 21-33, 2006.
- N. Barreira, M. G. Penedo, M. Penas. "Local Energy Minimizations: An Optimization for the Topological Active Volumes Model". *1st International Conference on Computer Vision Theory and Applications*, 2006.
- M. Penas, M. J. Carreira, M. G. Penedo, C. Mariño. "Segment extraction using Burns principles in a pseudo-color fuzzy Hough transform". *Iberian Conference on Pattern Recognition and Image Analysis (IbPRIA 2005)*, 2005.
- N. Barreira, M. G. Penedo, M. Penas. "Segmentación y Reconstrucción de Imágenes Médicas mediante Volúmenes Activos Topológicos y Detectores de Bordes 3D". *XXII Congreso Anual de la Sociedad Española de Ingeniería Biomédica (CASEIB)*, 2004.
- C. Mariño, M. G. Penedo, M. Penas. "Design of a distributed medical application using XML based data interchange ". *Lecture Notes in Computer Science* (paper selected from the *EUROCAST 2003*): 253-263, 2003.
- M. Penas, M. J. Carreira, M. G. Penedo. "Perceptual organization of directional primitives using a pseudo-color Hough transform". *13rd Scandinavian Conference on Image Analysis (SCIA 2003)*, 2003.
- C. Mariño, M. Penas, M. G. Penedo, J. M. Barja, V. Leborán, M. J. Carreira. "Methodology for the Registration of Whole SLO sequences". *International Conference on Pattern Recognition (ICPR 2002)*, 2002.
- M. J. Carreira, M. Mirmehdi, B. T. Thomas, M. Penas, "Perceptual primitives from an extended 4D Hough transform", *Image and Vision Computing*, 20: 969-980, 2002.
- C. Mariño, M. Penas, M. G. Penedo, M. J. Carreira, D. Lloret, "Integration of Mutual Information and Creaseness Based Methods for the Automatic Registration of SLO Sequences ", *Iberoamerican Symposium on Pattern Recognition (SIARP 2001)*, 2001.