Low-vision aid

C. A. Morillas, S. F. Romero, A. Martínez, F. J. Pelayo, E. Ros and E. Fernández, A design framework to model retinas, Biosystems, 87(2-3), pp. 156-163, 2007.

F.J. Pelayo, S. Romero, C. Morillas, A. Martínez, E. Ros, E. Fernández. Translating Image Sequences into Spike Patterns for Cortical Neuro-stimulation. Neurocomputing: Special Issue on Computational Neuroscience: Trends in research (Vol. 58-60), pp. 885-892, 2004.

M. D. Pelaez-Coca, F. Vargas-Martin, S. Mota, J. Díaz, E. Ros-Vidal, A versatile optoelectronic aid for low vision patients, Ophthalmic and Phsysiological Optics. 29, 565-572, 2009.

F. Barranco, J. Diaz, E. Ros, B. del Pino, Visual System Based on Artificial Retina for Motion Detection, IEEE Transactions on System, Man and Cybernetics, Part B: Cybernetics, 39(3),pp. 752-762, 2

Biomedical image processing

P. Guzman, R. Ros, E. Ros, Artery Segmentation in Ultrasound Images Based on an Evolutionary Scheme. Informatics. 1, 52-71, 2014.

P. Guzman, G. Hamarneh, R. Ros and E. Ros, Arterial Mechanical Motion Estimation Based on a Semi-Rigid Body Deformation Approach. Sensors, 14, 9429-9450, 2014.

Active vision systems and attention

F. Barranco, J. Diaz, A. Gibaldi, S. P. Sabatini and E. Ros, Vector Disparity Sensor with Vergence Control for Active Vision Systems. Sensors, 12, 1771-1799, 2012.

S. Granados, F. Barranco, S. Mota, J. Diaz, E. Ros, On-chip semidense representation map for dense visual features driven by attention processes, Journal of Real-Time Image Processing, 9(1), 171-185, 2014.

F. Barranco, B. Pino, J. Díaz, E. Ros, Real-Time Visual Saliency Architecture for FPGA with Top-Down Attention Modulation. IEEE Transactions on Industrial Informatics, 10(3), 1726-1735, 2014.

General-purpose low-level image processing

S. Mota, E. Ros, J. Díaz, E. M. Ortigosa and A. Prieto, Motion-Driven Segmentation by Competitive Neural Processing, Neural Processing Letters, 22(2), pp: 125 – 147, 2005.

J. Díaz, E. Ros, F. Pelayo, E. M. Ortigosa and S. Mota. FPGA based real-time optical-flow system. IEEE Transactions on Circuits for Video Technology. 16(2), pp. 274-279, 2006.

J. Diaz, E. Ros, S. Mota, F. Pelayo and E.M. Ortigosa, Subpixel motion computing architecture, IEE Proc.-Vis. Image Signal Process., 153(6), pp. 869-880, 2006.

J. Díaz, E. Ros, S. P. Sabatini, F. Solari, S. Mota, A Phase based stereo system-on-a-chip, BioSystems, 87, 314–321, 2007.

J. Díaz, E. Ros, S. Mota, R. Rodriguez-Gomez, FPGA-based architecture for motion sequence extraction, International Journal of Electronics, 94(5), 435 – 450, 2007.

J. Díaz, E. Ros, R. Rodríguez-Gomez, B. Pino, Real-time Architecture for Robust Motion Estimation under Varying Illumination Conditions, Journal of Universal Computer Science, 13 (3), 363-376, 2007.

J. Díaz, E. Ros, R. Carrillo and A. Prieto, Real-time system for high-image-resolution disparity, IEEE Trans. on Image Processing, 16(1), pp. 280-285, 2007.

J. Díaz, E. Ros, S. Mota, R.R. Carrillo, Local image phase, energy and orientation extraction using FPGAs, International Journal of Electronics, 95(7), pp. 743-760, 2008.

J. Díaz, E. Ros, R. Agís, J.L. Bernier, Superpipelined high-performance optical-flow computation architecture, Computer Vision and Image Understanding, 112, pp. 262-273, 2008.

M. Anguita, J. Díaz, E. Ros, F.J. Fernández-Baldomero, Optimization Strategies for High-Performance Computing of Optical-Flow in General-Purpose Processors, IEEE Trans. on Circuits and Systems for Video Technology, 19(10), 1475-1488, 2009.

G. Botella, A. García, M. Rodríguez-Álvarez, E. Ros, U. Meyer-Baese, M. C. Molina, Robust Bioinspired Architecture for Optical-Flow Computation, IEEE Transactions on VLSI Systems, 18(4), 616-629, 2010.

S. P. Sabatini, G. Gastaldi, F. Solari, K. Pauwels, M. M. Van Hulle, J- Diaz, E. Ros, N. Pugeault, N. Krüger, A compact harmonic code for early vision based on anisotropic frequency channels, Computer Vision and Image Understanding, 114, 681-699, 2010.

M. Vanegas, M. Tomasi, J. Díaz, E. Ros, Multi-port abstraction layer for FPGA intensive memory exploitation applications. Journal of Systems Architecture, 56(9), 442–451, 2010.

M. Tomasi, F. Barranco, M. Vane gas, J. Díaz, E. Ros, Fine grain pipeline architecture for high performance phase-based optical flow computation, Journal of Systems Architecture, 56(11), 577-587, 2010.

M. Tomasi, M. Vanegas, F. Barranco, J. Diaz, E. Ros, High-Performance Optical-Flow Architecture Based on a Multi-Scale, Multi-Orientation Phase-Based Model, IEEE Transactions on Circuits and Systems for Video Technology , 20(12), 1797-1807, 2010.

M. Tomasi, M. Vanegas, F. Barranco, J. Diaz, E. Ros, Massive Parallel-Hardware Architecture for Multiscale Stereo, Optical Flow and Image-Structure Computation, IEEE Transactions on Circuits and Systems for Video Technology, 22(2), 282-294, 2012.

F. Barranco, M. Tomasi, J. Diaz, M. Vanegas, E. Ros, Parallel Architecture for Hierarchical Optical Flow Estimation Based on FPGA, Very Large Scale Integration (VLSI) Systems, IEEE Transactions on , 20(6), 1058-1067, June 2012.

F. Barranco, J. Díaz, B. Pino, E. Ros, A multi-resolution approach for massively-parallel hardware-friendly optical flow estimation, J. Visual Communication and Image Representation, 23, 1272-1283, 2012.

F. Barranco, M. Tomasi, J. Díaz, M. Vanegas, E. Ros, Pipelined architecture for real-time cost-optimized extraction of visual primitives based on FPGAs, Digital Signal Processing, 23(2), 675-688, 2013. ISSN 1051-2004.

Vehicles – ADAS

J. Díaz Alonso, E. Ros Vidal, A. Rotter and M. Muehlenberg. Lane change Decision Aid system based on motion driven vehicle tracking, IEEE Transactions on Vehicular Technology, 57(5), pp. 2736 - 2746, 2008

P. Guzmán, J. Diaz, J. Ralli, R. Agis, E. Ros, Low-cost sensor to detect overtaking based on optical flow, Machine Vision and Applications, 25(3), 699-711, 2014.

Video-surveillance

R. Rodriguez-Gomez, E. J. Fernandez-Sanchez, J. Diaz and E. Ros, FPGA Implementation for Real-Time Background Subtraction Based on Horprasert Model. Sensors, 12(1), 585-611, 2012.

R. Rodriguez-Gomez, E. J. Fernandez-Sanchez, J. Diaz and E. Ros, Codebook hardware implementation on FPGA for background subtraction, Journal of Real-Time Image Processing, 2012.

E.J. Fernandez-Sanchez, J. Diaz, E. Ros, Background Subtraction Based on Color and Depth Using Active Sensors. Sensors 2013. 13, 8895-8915.

E. Fernandez-Sanchez, J. Diaz, E. Ros, Background subtraction model based on color and depth cues. Machine Vision and Applications. 25(5), 1211-1225, 2014.

Focal plane computation with Hybrid sensors

P. Guzmán, J. Díaz, R. Agís, E. Ros, Optical Flow in a Smart Sensor Based on Hybrid Analog-Digital Architecture. Sensors (Special issue on Motion Sensors), 10, 2975-2994, 2010.

Robotics-CPS

K. Pauwels, M. Tomasi, J. Diaz, E. Ros and M. M. Van Hulle, A Comparison of FPGA and GPU for Real-Time Phase-based Optical Flow, Stereo, and Local Image Features, IEEE Transactions on Computers, 61(7), 999-1012, 2012.

K. Pauwels, L. Rubio, E. Ros, Real-time Pose Detection and Tracking of Hundreds of Objects. IEEE Transactions on Circuits and Systems for Video Technology. 2015.

C. Fermuller, F. Wang, Y, Yang, K. Zampogiannis, Y. Zhang, F. Barranco, M. Pfeiffer, Prediction of manipulation actions, International Journal of Computer Vision, In Press, 2017.