

David Gerónimo

Computer Vision Researcher

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Research Interests

Object detection/recognition/tracking, machine learning, feature extraction/description, image segmentation, driver assistance systems, pedestrian protection.

Education

- 2006-2010* **Ph.D. with Honors in Computer Vision**, Univ. Autònoma de Barcelona, Spain.
Thesis: "*A global approach to vision-based pedestrian detection for advanced driver assistance systems*"
Advisor: Prof. Antonio M. López
- 2004-2006* **M.Sc. in Computer Vision**, Computer Vision Center, Spain.
Thesis: "*Model features and horizon line estimation for pedestrian detection in advanced driver assistance systems*"
Advisor: Prof. Antonio M. López
- 1999-2004* **B.Sc. in Computer Science**, Univ. Autònoma de Barcelona, Spain.
Final Project: "*Visión artificial aplicada a vehículos inteligentes*"
Advisor: Prof. Joan Serrat.

Research Experience

- 2010-now* **Postdoctoral Researcher**, Universitat Autònoma de Barcelona, Spain.
Research in object detection and tracking, with BSc and MSc teaching duties.
- 2011* **Visiting Postdoc**, Laboratoire d'Analyse et d'Architecture des Systèmes (LAAS-CNRS), France.
Six months stay in the Robotics, Action and Perception Lab (Toulouse) under the supervision of Prof. Frédéric Lerasle. The research topic was focused on multi-target particle-filtering tracking. Founded by Catalan Government AIRE-TCP postdoctoral mobility grant (competitive, ranked 1st/23).
- 2007* **Ph.D. Student Internship**, University of Surrey, Guildford, United Kingdom.
Six months stay in the Centre for Vision, Speech and Signal Processing (Guildford) under the supervision of Prof. Krystian Mikolajczyk. The research topic was focused on multi-class classification. Founded by Spanish Government FPI predoctoral mobility grant (competitive).
- 2006-2010* **Ph.D. Student**, Computer Vision Center, Spain.
Research on pedestrian detection (candidate generation, object classification, etc.).
Founded by Spanish Ministry FPI doctorate grant and supervised by Prof. Antonio M. López, head of the Advanced Driver Assistance Systems Group.

Publications

Journals D. Gerónimo, A.M. López, A.D. Sappa and T. Graf, "Survey of Pedestrian Detection for Advanced Driver Assistance Systems". In *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol. 32, Num. 7, pp.1239-1258, 2010.

D. Gerónimo, A.D. Sappa, D. Ponsa and A.M. López, "2D-3D-based on-board pedestrian detection system", In *Computer Vision and Image Understanding (Special Issue on Intelligent Vision Systems)*, Vol. 114, Num. 5, pp. 583-595, May 2010.

A.D. Sappa, F. Dornaika, D. Ponsa, D. Gerónimo and A. López. "An Efficient Approach to Onboard Stereo Vision System Pose Estimation", In *IEEE Transactions on Intelligent Transportation Systems*, Vol. 9, Num. 3, pp. 476-490. September 2008.

A.D. Sappa, D. Gerónimo, F. Dornaika and A. López, "On-board camera extrinsic parameter estimation", *IEE Electronics Letters*, 42(13), pp. 645-747, 2006.

Conferences J. Amores, D. Gerónimo and A.M. López, "Multiple instance learning for weakly-supervised object-class segmentation", In *Proc. International Conf. on Machine Vision, Hong Kong, China, 2010*.

J. Marín, D. Vázquez, D. Gerónimo and A.M. López, "Learning appearance in virtual scenarios for pedestrian detection", In *Proc. IEEE Int. Conf. on Computer Vision and Pattern Recognition, San Francisco, 2010*.

A.D.Sappa, F. Dornaika, D. Gerónimo and A.M. López, "Registration-based moving object detection from moving camera", In *Proc. International Conference on Intelligent Robots and Systems, 2nd Workshop on Planning, Perception and Navigation for Intelligent Vehicles*, pp. 65-69. Nice, France, 2008.

D. Gerónimo, A.D. Sappa, J. Alvarez and A. López. "Searching space reduction for on-board pedestrian detection". In *Current Challenges in Computer Vision. Proc. Of the Third CVC Workshop*, pp. 7-12. 2008.

D. Gerónimo, A.D. Sappa, A. López and D. Ponsa, "Adaptive Image Sampling and Windows Classification for On-Board Pedestrian Detection", In *Proc. Intl. Conference on Computer Vision Systems. Bielefeld, Germany, 2007*.

D. Gerónimo, A. López and A. Sappa. "Computer Vision Approaches to Pedestrian Detection: Visible Spectrum Survey", In *Proc. of the 3rd Iberian Conference on Pattern Recognition and Image Analysis, Part 1, LNCS 4477*, pp.547-554. Girona, Spain, 2007.

D. Gerónimo, A. López, D. Ponsa and A. Sappa. "Haar Wavelets and Edge Orientation Histograms for On-Board Pedestrian Detection", In *Proc. of the 3rd Iberian Conference on Pattern Recognition and Image Analysis, Part 1, LNCS 4477*, pp. 418-425. Girona, Spain, 2007.

A.D. Sappa, F. Dornaika, D. Gerónimo and A. López, "Efficient On-Board Stereo Pose Estimation", In *Proc. EUROCAST 2007, Workshop on Cybercars and Intelligent Vehicles, LNCS 4739*, pp. 1183-1190. Las Palmas de Gran Canaria, Spain, 2007.

A.D. Sappa, R. Herrero, F. Dornaika, D. Gerónimo and A. López, "Road Approximation in Euclidean and v-disparity space: A Comparative Study", In *Proc. EUROCAST 2007, Workshop on Cybercars and Intelligent Vehicles, LNCS 4739*, pp. 1105-1112. Las Palmas de Gran Canaria, Spain, 2007.

A.D. Sappa, D. Gerónimo, F. Dornaika and A. López, "Real Time Vehicle Pose Using On-Board Stereo-Vision System", In *Proc. Intl. Conference on Image Analysis and Recognition, LNCS 4142*, pp. 205-216, Póvoa de Varzim, Portugal, 2006.

D. Gerónimo, A.D. Sappa, A. López and D. Ponsa, "Pedestrian Detection using AdaBoost learning of features and vehicle pitch estimation", In *Proc. IASTED Intl. Conference on Visualization, Imaging and Image Processing*, pp. 400-405, Palma de Mallorca, Spain, 2006.

Books and Book Chapters J. Marín, D. Gerónimo, D. Vázquez and A.M. López, "Pedestrian detection: exploring virtual worlds", in *Handbook of Pattern Recognition: Methods and Applications* (Ed. Khalid Hosny and Jorge de la Calleja), i-Concept Press, 2012. (in press)

A.D. Sappa, D. Gerónimo, F. Dornaika, M. Rouhani and A.M. López, "Moving object detection from mobile platforms using stereo data registration", *Chapter 3 in Computational Intelligence Paradigms in Advanced Pattern Classification. Studies in Computational Intelligence* (Ed. Marek R. Ogiela and Lakhmi C. Jain), Springer-Verlag Book Series, vol. 386/2012, pp. 25-37, 2012.

F. Diego, D. Gerónimo and J. Vazquez-Corral (Eds.), "State of the Art of Research and Development in Computer Vision. Proceedings of the Sixth CVC Workshop". ISBN-978-84-938351-5-6, Computer Vision Center 2011.

D. Gerónimo, A.D. Sappa and A.M. López, "Stereo-based Candidate Generation for Pedestrian Protection Systems". *Chapter 9 in Binocular Vision: Development, Depth and Disorders* (Ed. Jacques McCoun and Lucien Reeves), NOVA Publishers, pp. 189-208, 2010.

A.D. Sappa, D. Gerónimo, F. Dornaika and A. López, "Stereo vision camera pose estimation for On-board applications", *Chapter 3 in Scene Reconstruction, Pose Estimation and Tracking, Rustam Stoking*, pp. 39-50, 2007.

Non-indexed publications D. Gerónimo, "People Power", In *Vision Zero International*, pp. 28-33, January 2011.

D. Gerónimo and A.M. López, "Detecció de vianants per a sistemes avançats d'assistència al conductor" (Spanish/Catalan). In *UAB Divulga*, September 2010.

D. Gerónimo and A.M. López, "Sistema de detecció de vianants" (Spanish/Catalan). In *UAB Divulga*, April 2010.

Recent Public Funding Projects

- 2012-now *eCo-DRIVERS: Ecologic Cooperative Driver and Road Intelligent Visual Exploration for Route Safety*
- 2008-2012 *Multimodal Interaction in Pattern Recognition and Computer Vision (CONSOLIDER INGENIO-2010)*
- 2008-2010 Computer Vision Based Detection and Tracking of Vehicles and Pedestrians for ADAS

Professional Activities

- Journal Reviewing** IEEE Transactions on Intelligent Transportation Systems (2011,12)
Scientific Research and Essays (2012)
Applied Soft Computing - Elsevier (2012)
Aerospace Science & Technology - Elsevier (2011)
Computer Vision and Image Understanding - Elsevier (2011)
IEEE Transactions on Neural Networks (2010,2011)
Computers and Mathematics with Applications - Elsevier (2010)
Journal of Real-time Image Processing - Springer (2010)
- Conference Reviewing** EURASIP European Signal Processing Conference (2012)
IEEE Int'l Conf. on Image Processing (2009,10,11,12)
IEEE Int'l Conf. Intelligent Vehicles Symposium (2010,11)
IEEE Int'l Conf. Intelligent Transportation Systems (2010)
Int'l Conf. on Intelligent Computing (2007,08,09)
- Organization and Boards** Organizing Chair of Int. Workshop of Computer Vision in Vehicle Technology (2011,12)
Local Arrangement of International Conference on Computer Vision (ICCV) (2011)
General Chair of CVC Workshop on R&D (2011)
Editorial Board of Int. Journal of Computer Vision and Signal Processing (2011)
- Program Committees** IASTED Conf. on Comp. Graphics and Imaging (2010,11,12)
IASTED Conf. on Comp. Vision (2011)
IAPR Conf. on Informatics, Electronics & Vision (2011)

Supervised Students

- currently* **Albert Saà**
Msc Student at Computer Vision Center (Spain)
- 2011 **Karel Paleček**
PhD Internship at LAAS-CNRS (France)
"Pre-detection of humans using fast cues", co-supervised with F. Lerasle.
- 2009 **Hilda Caballero**
MSc Student at Computer Vision Center (Spain)
"Pedestrian detection refinement via non-explicit shape models", co-supervised with A.M. López.
- 2009 **David Vázquez**
MSc Student at Computer Vision Center (Spain)
" he effect of the distance in pedestrian detection", co-supervised with A.M. López.

Teaching Experience

- Spring 2012* **Foundations of Software Engineering,**
Bachelor of Telecommunications, Univ. Autònoma de Barcelona.
- Fall 2011* **Computer Vision Module Project,**
Master in Computer Vision and Artificial Intelligence, Univ. Autònoma de Barcelona.
- 2009/10/11* **Local Image Descriptors (Computer Vision),**
Master in Computer Vision and Artificial Intelligence, Univ. Autònoma de Barcelona.
- 2010/11/12* **Java Lab. (Object-Oriented Design and Programming)**
Bachelors in Comp. Sc., Telecomm. & Multimedia, Univ. Oberta de Catalunya.
- Fall 2010* **Software Engineering 1,**
Bachelor of Computer Science, Univ. Autònoma de Barcelona.
- Fall 2010* **Computer Graphics 1,**
Bachelor of Computer Science, Univ. Autònoma de Barcelona.
- Fall 2010* **Graphical Techniques,**
Bachelor of Computer Science, Univ. Autònoma de Barcelona.
- Spring 2008/09* **Software Engineering 2,**
Bachelor of Computer Science, Univ. Autònoma de Barcelona.
- Fall 2004* **Programming Languages,**
Bachelor of Computer Science, Univ. Autònoma de Barcelona.

Seminars, Courses and Summer Schools

- currently* **Machine Learning Course**
University of Stanford - Coursera Online Education
- 2008* **AERFAI Summer School on New Trends in Pattern Recognition for Motion Analysis**
Barcelona, Spain
- 2007* **Fifth Int. Summer School on Pattern Recognition**
Plymouth, United Kingdom
- 2006* **Fifth LEARNING Workshop (LARCA & PASCAL Dialogues)**
Vilanova i la Geltrú, Spain
- 2006* **AERFAI Summer School on Action and Object Classification Techniques in Digital Images**
Granada, Spain

Other Non-Scientific Activities

- Activity** **Web Development**
- Technologies* HTML, CSS, PHP, JavaScript, SQL, AJAX.
- Works* *www.cvc.uab.es/adas* (2005-present) - research group
modulez.org (2000-present) - amateur music portal
yero.org (1999-present) - personal art website
srs.scenesp.org (2002-2006) - photo aggregator
(many others not listed)
- Activity** **Real time Motion Graphics Development** (+info @ www.sectoromega.org)
- Technologies* C++, OpenGL, Visual Studio, Photoshop, 3DSMax, Impulse Tracker, etc.
- Works* *The Message* (Programmer, Graphics 2D) - #2nd Demo Comp. BCNParty (2005)
Decadentia (Graphics Artist 2D/3D) - #1st Demo Competition IfParty (2004)
Nagatabi (Programmer, Graphics 2D/3D) - #2nd Demo Comp. BCNParty (2004)
Mirages (Programmer, Graphics 2D/3D) - #3rd Demo Comp. BCNParty (2003)
Euskal Invtro (Musician) - EuskalParty'02 (2002)

Languages

English - Fluent (Cambridge FCE, 1999)
French - Elementary
Catalan - Native
Spanish - Native

Other Information

- Birth* October 1981, Spanish Citizenship, Single.
- Interests* Graphic design, sci-fi series & literature, running, cooking...