

Michael Villamizar

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Research Interests

Computer vision, machine learning and robotics.

Software Skills

Python, TensorFlow, Matlab, C++, ROS, OpenCV, Linux, Latex, Blender.

Professional Experience

- 2016-Present** Postdoctoral Researcher - Idiap Research Institute
- 2012-2016** Postdoctoral Researcher - Institut de Robòtica i Informàtica Industrial (CSIC-UPC)
Spanish National Research Council (CSIC) - Universitat Politècnica de Catalunya (UPC)
- 2004-2012** PhD Researcher - Institut de Robòtica i Informàtica Industrial (CSIC-UPC)
Spanish National Research Council (CSIC) - Universitat Politècnica de Catalunya (UPC)

Education

- 2004-2012** PhD in Computer vision and robotics - Universitat Politècnica de Catalunya (UPC)
Barcelona - Spain
- 1999-2004** Mechatronics Engineering - Universidad de San Buenaventura
Bogotá - Colombia

Research Projects

- 2018-Present** Adatis: Optimisation du Controle Qualite
The Ark - Switzerland
- 2017-Present** Unicity: 3D scene understanding through machine learning to secure entrance zones
Innovation Promotion Agency - CTI - Switzerland
- 2016-2018** VIEW-2: Visibility Improvement for Events Webcasting
Innovation Promotion Agency - CTI - Switzerland
- 2013-2016** ViSen: Visual Sense, Tagging visual data with semantic descriptions
(PCIN-2013-047) - European project
- 2014-2016** Robot-Int-Coop: Robot-Human Interaction, Cooperation and Learning in Urban Areas
(DPI2013-42458-P) - National project - Spain

- 2011-2015** ARCAS: Aerial Robotics Cooperative Assembly System
(FP7-ICT-2011-7-287617) - European project
- 2011-2014** RobTaskCoop: Cooperación robots humanos en áreas urbanas
(DPI2010-17112) - National project - Spain
- 2007-2012** MIPRCV: CONSOLIDER-INGENIO 2010 Multimodal interaction in pattern recognition and computer vision
(CSD 2007-00018) - National project - Spain
- 2006-2009** URUS: Ubiquitous networking robotics in urban settings
(IST-FP6-STREP-045062) - European project
- 2005-2006** NRS: Research atelier network robot systems
(NoE-507728, RA) - European project

Research Visits

- 2010** Departement Elektrotechniek (ESAT) - Katholieke Universiteit Leuven
Advisors: Prof. Luc Van Gool and Dr. Helmut Grabner
Leuven - Belgium

Students Supervision

Master Students

- 2015-2016** Alejandro Hernandez Ruiz, Online and active object recognition methods for human-robot interaction, Universitat Politècnica de Catalunya (UPC), Barcelona, Spain
Co-Advisor: Prof. Rene Alquezar
- 2014-2015** Antonio Rubio Romano - 3D pose estimation using convolutional neural networks
Universitat Politècnica de Catalunya (UPC), Barcelona, Spain
Co-Avisor: Dr. Francesc Moreno Noguer

Awards

- 2016** Diploma of the Universitat Politècnica de Catalunya
In recognition to the Best Poster Award (2015)
Barcelona, Spain, 2016
- 2015** Best Poster Award
Iberian Conference on Pattern Recognition and Image Analysis (IBPRIA)
Santiago de Compostela, Spain, 2015
- 2015** Diploma of the Universitat Politècnica de Catalunya
In recognition to the Best Computer Vision Paper Award (2014)
Barcelona, Spain, 2015
- 2014** Best Computer Vision Paper Award
Jornadas de Automática
Valencia, Spain, 2014

Summer/Autumn Schools

- 2015** II Autumn School on Deep Learning
Organized by University of Valencia
Topics: Deep learning
Valencia, Spain, November 2015
- 2008** International Computer Vision Summer School (ICVSS)
Organized by University of Cambridge and University of Catania
Topics: Reconstruction and recognition
Sicily, Italy, June 2008

Languages

Spanish (native), English (good), Catalan (basic), French (basic)

Publications

Journal Articles

- 2018** Online Learning and Detection of Faces with Low Human Supervision
M. Villamizar, A. Sanfeliu and F. Moreno-Noguer
The Visual Computer Journal (TVCJ)
- 2017** Boosted Random Ferns for Object Detection
M. Villamizar, J. Andrade-Cetto, A. Sanfeliu and F. Moreno-Noguer
IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)
- 2017** Teaching Robot's Proactive Behavior using Human Assistance
A. Garrell, **M. Villamizar**, F. Moreno-Noguer and A. Sanfeliu
International Journal of Social Robotics (IJSR), 2017
- 2016** Random Clustering Ferns for Multimodal Object Recognition
M. Villamizar, A. Garrell, A. Sanfeliu and F. Moreno-Noguer
Neural Computing and Applications (NCAA), 2016
- 2016** Interactive Multiple Object Learning with Scanty Human Supervision
M. Villamizar, A. Garrell, A. Sanfeliu and F. Moreno-Noguer
Computer Vision and Image Understanding (CVIU), 2016
- 2012** Bootstrapping Boosted Random Ferns for Discriminative and Efficient Object Classification
M. Villamizar, J. Andrade-Cetto, A. Sanfeliu and F. Moreno-Noguer
Pattern Recognition, 2012

Book Chapters

- 2013** Robot Interactive Learning through Human Assistance
G. Ferrer, A. Garrell, **M. Villamizar**, I. Huerta and A. Sanfeliu
Multimodal Interaction in Image and Video Applications
Springer Berlin Heidelberg, pp. 185-203, 2013
- 2007** Object Recognition
J. Andrade-Cetto and **M. Villamizar**
Wiley Encyclopedia of Electrical and Electronics Engineering [Book Chapter]
John Wiley and Sons, p. 1-28, 2007

PhD Thesis

2012 Efficient Approaches for Object Class Detection
M. Villamizar
Barcelona, Spain, September 2012

Conference Articles

- 2018** WatchNet: Efficient and Depth-based Network for People Detection in Video Surveillance Systems
M. Villamizar, A. Martinez-Gonzalez, O. Canevet and J.M Odobez
International Conference on Advanced Video and Signal-based Surveillance (AVSS)
Auckland, New Zealand, November 2018
- 2018** UNICITY: A depth maps database for people detection in security airlocks
J. Dumolin, O. Canevet, **M. Villamizar**, H. Nunes, E. Mugellin, F. Moscheni, and J.M Odobez
International Conference on Advanced Video and Signal-based Surveillance Workshop (AVSSW)
Auckland, New Zealand, November 2018
- 2018** Real-time Convolutional Networks for Depth-based Human Pose Estimation
A. Martinez-Gonzalez, **M. Villamizar**, O. Canevet and J.M Odobez
International Conference on Intelligent Robots and Systems (IROS)
Madrid, Spain, October 2018
- 2018** Investigating Depth Domain Adaptation for Efficient Human Pose Estimation
A. Martinez-Gonzalez, **M. Villamizar**, O. Canevet and J.M Odobez
European Conference on Computer Vision Workshop (ECCVW)
Munich, Germany, September 2018
- 2017** Aerial Social Force Model: A New Framework to Accompany People Using Autonomous Flying Robots
A. Garrell, L. Garza-Elizondo, **M. Villamizar**, F. Herrero and A. Sanfeliu
International Conference on Intelligent Robots and Systems (IROS)
Vancouver, Canada, September 2017
- 2015** Real Time People Detection Combining Appearance and Depth Image Spaces using Boosted Random Ferns
V. Vaquero, **M. Villamizar** and A. Sanfeliu
ROBOT'2015: Iberian Robotics Conference
Lisbon, Portugal, November 2015
- 2015** Modeling Robot's World with Minimal Effort
M. Villamizar, A. Garrell, A. Sanfeliu and F. Moreno-Noguer
International Conference on Robotics and Automation (ICRA)
Seattle, USA, July 2015
- 2015** Efficient Monocular Pose Estimation for Complex 3D Models
A. Rubio, **M. Villamizar**, L. Ferraz, A. Penate-Sanchez, A. Ramisa, E. Simo-Serra, A. Sanfeliu and F. Moreno-Noguer
International Conference on Robotics and Automation (ICRA)
Seattle, USA, July 2015
- 2015** Multimodal Object Classification using Random Clustering Trees
M. Villamizar, A. Garrell, A. Sanfeliu and F. Moreno-Noguer
Iberian Conference on Pattern Recognition and Image Analysis (IbPRIA)
Santiago de Compostela, Spain, June 2015
- 2014** Fast Online Learning and Detection of Natural Landmarks for Autonomous Aerial Robots
M. Villamizar, A. Sanfeliu and F. Moreno-Noguer
International Conference on Robotics and Automation (ICRA)
Hong Kong, July 2014

- 2014** Estimacion monocular y eficiente de la pose usando modelos 3D complejos
A. Rubio, **M. Villamizar**, L. Ferraz, A. Penate-Sanchez, A. Sanfeliu and F. Moreno-Noguer
XXXV Jornadas de Automatica
Valencia, Spain, September 2014
- 2013** Proactive Behavior of an Autonomous Mobile Robot for Human-Assisted Learning
A. Garrell, **M. Villamizar**, F. Moreno-Noguer and A. Sanfeliu
International Symposium on Robot and Human Interactive Communication (IEEE RO-MAN)
Gyeongju, Korea, August 2013
- 2012** Online Human-Assisted Learning using Random Ferns
M. Villamizar, A. Garrell, A. Sanfeliu and F. Moreno-Noguer
International Conference on Pattern Recognition (ICPR)
Tsukuba, Japan, November 2012
- 2011** Efficient 3D Object Detection using Multiple Pose-Specific Classifiers
M. Villamizar, H. Grabner, J. Andrade-Cetto, L. Van Gool, A. Sanfeliu and F. Moreno-Noguer
British Machine Vision Conference (BMVC)
Dundee, UK, September 2011
- 2011** Detection Performance Evaluation of Boosted Random Ferns
M. Villamizar, F. Moreno-Noguer, J. Andrade-Cetto and A. Sanfeliu
Iberian Conference on Pattern Recognition and Image Analysis (IBPRIA)
Las Palmas de Gran Canaria, Spain, June 2011
- 2010** Efficient Rotation Invariant Object Detection using Boosted Random Ferns
M. Villamizar, F. Moreno-Noguer, J. Andrade-Cetto and A. Sanfeliu
Conference on Computer Vision and Pattern Recognition (CVPR)
San Francisco, USA, June 2010
- 2010** Shared Random Ferns for Efficient Detection of Multiple Categories
M. Villamizar, F. Moreno-Noguer, J. Andrade-Cetto and A. Sanfeliu
International Conference on Pattern Recognition (ICPR)
Istanbul, Turkey, August 2010
- 2010** Comparative Analysis for Detecting Objects Under Cast Shadows in Video Images
J. Scandaliaris, **M. Villamizar** and A. Sanfeliu
International Conference on Pattern Recognition (ICPR)
Istanbul, Turkey, August 2010
- 2009** Combining Color-Based Invariant Gradient Detector with HOG Descriptors for Robust Image Detection in Scenes Under Cast Shadows
M. Villamizar, J. Scandaliaris, J. Andrade-Cetto and A. Sanfeliu
International Conference on Robotics and Automation (ICRA)
Kobe, Japan, May 2009
- 2009** Local Boosted Features for Pedestrian Detection
M. Villamizar, A. Sanfeliu and J. Andrade-Cetto
Iberian Conference on Pattern Recognition and Image Analysis (IBPRIA)
Povoa de Varzim, Portugal, June 2009
- 2007** Robust Color Contour Object Detection Invariant to Shadows
J. Scandaliaris, **M. Villamizar**, J. Andrade-Cetto and A. Sanfeliu
Robust Color Contour Object Detection Invariant to Shadows
Vina del Mar - Valparaiso, Chile, November 2007
- 2007** Unidimensional Multiscale Features for Efficient Rotated Object Detection Under Mild Occlusions
M. Villamizar, A. Sanfeliu and J. Andrade-Cetto
Iberian Conference on Pattern Recognition and Image Analysis (IBPRIA)
Girona, Spain, June 2007

- 2006** Computation of Rotation Local Invariant Features Using the Integral Image for Real Time Object Detection
M. Villamizar, A. Sanfeliu and J. Andrade-Cetto
International Conference on Pattern Recognition (ICPR)
Hong Kong, China, August 2006
- 2006** Orientation Invariant Features for Multiclass Object Recognition
M. Villamizar, A. Sanfeliu and J. Andrade-Cetto
Iberoamerican Congress on Pattern Recognition (CIARP)
Cancun, Mexico, November 2006
- 2006** Computo de Características Invariantes a la Rotación para el Reconocimiento de Distintas Clases de Objetos
M. Villamizar, A. Sanfeliu and J. Andrade-Cetto
Jornadas de Automática
Almería, Spain, September 2006

Press

- 2015** TVE [Television]
TVE - L'informatiu, Barcelona, Spain, 28/02/2015
- 2014** El Periódico [Newspaper]
El Periódico (Ed. Català) Sociedad, Barcelona, Spain, 17/02/2014
- 2012** El Mundo [Newspaper]
El Mundo (Ed. Catalunya) Innovadores, Barcelona, Spain, 23/03/2012

Additional Links

- Citations** Google scholar [h-index: 12]
- Videos** Youtube [about 20K views]
- Code** Bitbucket [18 algorithms]