



## PERSONAL INFORMATION

Name **GARCIA BECERRO, Frederic**  
Address **IEE S.A., 11, rue Edmond Reuter, L-5326 Contern, Luxembourg**  
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Nationality **Spanish**  
Gender **Male**  
Date of birth **October 2, 1982**

## RESEARCH INTEREST

My current research is on developing real-time and practical approaches for person recognition/identification as well as gesture/action/behaviour recognition within the automotive sector. Robust head pose and gaze estimation, 2D/3D feature extraction and classification, and fusion of multi-modal sensors are a few of the challenges that I am facing daily.

## EDUCATION

Title of qualification awarded **Ph.D. in Computer Science**  
Name of organization **University of Luxembourg and IEE S.A. (Luxembourg)**  
Dates (from – to) **2008 – 2012**

Title of qualification awarded **European MSc. in Computer Vision and Robotics (VIBOT)**  
Name of organization **Heriot-Watt University (Scotland), Université de Bourgogne (France) and Universitat de Girona (Spain)**  
Dates (from – to) **2006 – 2008**

Title of qualification awarded **MSc. in Computer Science**  
Name of organization **Universitat de Girona (Spain)**  
Dates (from – to) **2003 – 2006**

Title of qualification awarded **BSc. in Technical Computer Systems Engineering**  
Name of organization **Universitat de Girona (Spain)**  
Dates (from – to) **2000 – 2003**

Title of qualification awarded **Baccalaureate in Science and Technology**  
Name of organization **IES Frederic Martí Carreres (Spain)**  
Dates (from – to) **1998 – 2000**

## DISSERTATIONS

- Ph.D. Thesis title: *“Sensor Fusion Combining 3-D and 2-D for Depth Data Enhancement”*  
Advisors: Prof. Dr Björn Ottersten and Dr. Bruno Mirbach
- VIBOT MSc. Thesis title: *“External-Self-Calibration of a 3-D Time-of-Flight camera in real environments”*  
Advisors: Prof. Dr Fabrice Mériaudeau and Dr. Bruno Mirbach.
- Computer Science MSc. Thesis title: *“Dense 3-D reconstruction of complex objects using a trinocular system”*  
Advisor: Prof. Dr Rafael Garcia
- Technical Computer Systems Engineering BSc. Thesis title: *“Real time visualization and modelling of caustics”*  
Advisor: Ass. Prof. Dr Gustavo Patow

## PROFESSIONAL EXPERIENCE

Dates (from – to)	April, 2014 – Present
Employer	<i>PTU Optical, IEE S.A. Contern, Luxembourg</i>
Occupation or position held	Computer Vision Scientist
Dates (from – to)	April, 2012 – April, 2014
Employer	<i>Interdisciplinary Centre for Security, Reliability and Trust (SnT), University of Luxembourg, Luxembourg</i>
Occupation or position held	Research Associate – Post Doc
Dates (from – to)	September, 2004 – February 2008
Employer	<i>Sports Centre of the University of Girona, Spain</i>
Occupation or position held	IT Engineer and Webmaster
Dates (from – to)	May, 2004 – September 2004
Employer	<i>Electronics, Computer Science and Automatic Department, Laboratory of Submarine Robotics and 3D Perception, University of Girona, Spain</i>
Occupation or position held	Research Intern
Dates (from – to)	June 2001– September 2001 and June 2002 – September 2002
Employer	<i>Proweb Computer Systems, S.L., Spain</i>
Occupation or position held	Employee

## AWARDS AND GRANTS

- 7<sup>th</sup> Int. Symposium on Image and Signal Processing and Analysis (ISPA). Best student paper award, 2011
- Full coverage of Ph.D. tuition through AFR Grant Scheme (Aides à la Formation-Recherche), managed by the National Research Fund Luxembourg (FNR). AFR Grant: TR-PHD BFR08-120. 2008-2012
- Finalist in Research Projects for secondary school students at University of Girona: “The Mod-Chip”, 2000

## AFFILIATIONS & SERVICES

- Member of IEEE Signal Processing Society (2012-2013), SPIE (2015)
- Reviewer at IET Computer Vision, IEEE Intelligent Vehicles Symposium
- Session chair at the VISAPP 2015 Conference

## ACADEMIC CO-SUPERVISION

Ph.D	▪ Project title: “ <i>Driver Attention Monitoring System (DAMS)</i> ” Student: Jilliam María Díaz Barros Dates (from – to): February 2015– Present
MSc.	▪ Thesis title: “ <i>Real-Time 3D Human Pose Estimation from Point Cloud</i> ” Student: Jilliam María Díaz Barros Dates (from – to): February 2014– June 2014
MSc.	▪ Thesis title: “ <i>Enhancement of Stereo Sensing by Fusion</i> ” Student: Hashim Kemal Abdella Dates (from – to): February 2012– June 2012

## PUBLICATIONS

### Journals

- **F. Garcia**, C. Schockaert, B. Mirbach. *“Real-Time Visualization of Low Contrast Targets from High-Dynamic-Range Infrared Images based on Temporal Digital Detail Enhancement Filter”*, Journal of Electronic Imaging (JEI), 2015
- **F. Garcia**, D. Aouada, B. Mirbach, T. Solignac, B. Ottersten. *“Unified Multi-Lateral Filter for Real-Time Depth Map Enhancement”*, Image and Vision Computing, vol. 41, pp. 26-41, ISSN. 0262-8856, Sep. 2015
- **F. Garcia**, D. Aouada, T. Solignac, B. Mirbach, B. Ottersten. *“Real-Time Depth Enhancement by Fusion for RGB-D Cameras”*, IET Computer Vision, vol. 7, no. 5, Oct. 2013
- **F. Garcia**, D. Aouada, B. Mirbach, B. Ottersten. *“Real-Time Distance-Dependent Mapping for a Hybrid ToF Multi-Camera Rig”*, IEEE Journal of Selected Topics in Signal Processing (JSTSP), vol. 6, no. 5, ISSN. 1932-4553, Sep. 2012

### Conferences

- C. Schockaert, **F. Garcia**, B. Mirbach. *“Guidance Image Based Method for Real-Time Motion Artefact Handling on Time-of-Flight Cameras”*, IEEE Intelligent Vehicles Symposium (IV), 2015
- **F. Garcia**, C. Schockaert, B. Mirbach. *“Noise removal and real-time detail enhancement of high-dynamic-range infrared images with time consistency”*, International Conference on Quality Control by Artificial Vision (QCAV), 2015
- J.M. Díaz Barros, **F. Garcia**, D. Sidibe. *“Real-Time Human Pose Estimation from Body-Scanned Point Clouds”*, International Conference on Computer Vision Theory and Applications (VISAPP), pp. 553-560, 2015
- **F. Garcia**, C. Schockaert, B. Mirbach. *“Real-Time Visualization of High-Dynamic-Range Infrared Images based on Human Perception Characteristics. Noise removal, image detail enhancement and time consistency”*, International Conference on Computer Vision Theory and Applications (VISAPP), pp. 144-152, 2015
- **F. Garcia**, B. Ottersten. *“Real-Time Curve-Skeleton Extraction of Human-Scanned Point Clouds. Application in Upright Human Pose Estimation”*, International Conference on Computer Vision Theory and Applications (VISAPP), pp. 54-60, 2015
- **F. Garcia**, B. Ottersten. *“CPU-Based Real-Time Surface and Solid Voxelization for Incomplete Point Cloud”*, International Conference on Pattern Recognition (ICPR), 24-28 Aug. 2014
- **F. Garcia**, D. Aouada, H. K. Abdella, T. Solignac, B. Mirbach, B. Ottersten. *“Depth Enhancement by Fusion for Passive and Active Sensing”*, Workshop in European Conference on Computer Vision (ECCVW), 7-13 Oct. 2012
- **F. Garcia**, D. Aouada, B. Mirbach, B. Ottersten. *“Spatio-Temporal ToF Data Enhancement by Fusion”*, IEEE International Conference on Image Processing (ICIP), 30 Sep - 3 Oct. 2012
- **F. Garcia**, D. Aouada, B. Mirbach, B. Ottersten. *“A New 1-D Colour Model and its Application to Image Filtering”*, 7th International Symposium on Image and Signal Processing and Analysis (ISPA), pp. 134-138, 4-6 Sep. 2011
- **F. Garcia**, D. Aouada, B. Mirbach, T. Solignac, B. Ottersten, *“A New Multi-*

*Lateral Filter for Real-Time Depth Enhancement*", 8th IEEE International Conference on Advanced Video and Signal-Based Surveillance (AVSS), pp. 1-6, 30 Aug - 2 Sep. 2011

▪ **F. Garcia**, D. Aouada, B. Mirbach, T. Solignac, B. Ottersten, "*Real-time Hybrid ToF Multi-Camera Rig Fusion System for Depth Map Enhancement*", International Workshop on Human Activity Understanding from 3D Data (HAU3) in conjunction with IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR), pp. 1-8, 24 Jun. 2011

▪ **F. Garcia**, D. Aouada, B. Mirbach, B. Ottersten, "*Spiral Colour Model: Reduction from 3-D to 2-D*", IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), pp.1-4, 22-27 May 2011

▪ **F. Garcia**, B. Mirbach, B. Ottersten, F. Grandidier, and A. Cuesta. "*Pixel Weighted Average Strategy for Depth Sensor Data Fusion*". IEEE International Conference on Image Processing (ICIP), pp. 2805–2808, September 2010

Patents ▪ **F. Garcia**, B. Mirbach, T. Solignac and D. Aouada. "*Depth Image Enhancement Method*", WO2014044569 A1. March 2014.

▪ **F. Garcia** and B. Mirbach. "*Range Image Pixel Matching Method*", US 2013/0272600 A1. October 2013.

▪ **F. Garcia**, F. Grandidier, B. Mirbach, R. Orsello and T. Solignac. "*3D Time-of-Flight Camera System and Position/Orientation Calibration Method Therefor*", US 2011/0205340. August 2011

## SKILLS

### Technical

- Unix/Windows Programming Languages: C, C++, QT, Matlab
- Computer Vision / Image Processing Libraries: OpenCV, OpenNI, Point Cloud Library (PCL)
- Computer Vision and Robot Simulator: V-REP
- HTML Design: HTML, DHTML, JavaScript, jQuery, PHP, XML, SQL
- Digital photography (II): Photoshop

### Communication

- Spanish: Native speaker
- Catalan: Native speaker
- French: Limited working proficiency
- English: Professional working proficiency

### References

- *Dr Bruno Mirbach*: Team leader of the computer vision group at IEE S.A, Luxembourg, [bruno.mirbach@iee.lu](mailto:bruno.mirbach@iee.lu)
- *Prof. Dr Björn Ottersten*: Director of the Interdisciplinary Centre for Security Reliability and Trust (SnT) of the University of Luxembourg (UL), Luxembourg, [bjorn.ottersten@uni.lu](mailto:bjorn.ottersten@uni.lu)
- *Prof. Dr. Joaquim Salvi*: Director of the Polytechnic School of the University of Girona (UdG), Spain, [joaquim.salvi@udg.edu](mailto:joaquim.salvi@udg.edu)