

Sergio Orts Escolano

CONTACT INFORMATION

Microsoft
Interactive 3D Technologies
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RESEARCH INTERESTS

High Performance Computing, Computer Vision, General-Purpose Computation on Graphics Processing Unit (GPGPU), 3D data processing, Unsupervised learning.

EDUCATION

PhD in Computer Science

January 2011 - January 2014. Computer Technology Department. University of Alicante.

- Thesis Topic: “A Three-Dimensional Representation method for Noisy Point Clouds based on Growing Self-Organizing Maps accelerated on GPUs”
- Supervisors: Jose Garcia-Rodriguez and Miguel Cazorla-Quevedo.
- This thesis obtained the highest mark (10) and was approved by external reviewers for international mention.

- **Abstract:**

The research described in this thesis was motivated by the need of a robust model capable of representing 3D data obtained with 3D sensors, which are inherently noisy.

This thesis proposed the use of Self-Organizing Maps (SOMs) as a 3D representation model. In particular, we proposed the use of the Growing Neural Gas (GNG) network, which has been successfully used for clustering, pattern recognition and topology representation of multi-dimensional data. Until now, Self-Organizing Maps have been primarily computed offline and their application in 3D data has mainly focused on free noise models, without considering time constraints. It is proposed a hardware implementation leveraging the computing power of modern GPUs, which takes advantage of a new paradigm coined as General-Purpose Computing on Graphics Processing Units (GPGPU).

The proposed methods were applied to different problems and applications in the area of computer vision such as the recognition and localization of objects and 3D scene reconstruction.

MSc in Computer Science, University of Alicante, 2010 - 2011

- Dissertation Topic: “Accelerated Reconstruction of 3D Scenes using Self-Organizing Maps”
- Supervisor: Jose. Garcia-Rodriguez and Miguel Cazorla-Quevedo
- Graduated with honours (9/10)

MSc in Java Enterprise applications and web services, University of Alicante, 2011 - 2012

- Graduated with honours (10/10)

BSc in Computer Science, University of Alicante, 2005 - 2010

- Average grade (8.1/10) 2nd in the promotion (out of 150)

- **August 2015 - present: Visiting Researcher, Microsoft Research (Interactive 3D Technologies group) under the supervision of Shahram Izadi**

With more than 1,000 scientists and engineers working across multiple research areas in laboratories worldwide, Microsoft Research is making significant product contributions that help solve global challenges. At MSR, I:

- Developed a 360 degrees real-time 3D capture system for tele-immersive communication.
- Did research and developed new depth sensing techniques based on structured light and stereo cameras.
- Participated in Microsoft Holoportation project: a new type of 3D capture technology that allows high-quality 3D models of people to be reconstructed, compressed and transmitted anywhere in the world in real time.
- Participated in Hyperdepth project: a machine learning based approach for solving stereo correspondence problem efficiently, without compromising depth accuracy.
- Participated in Fusion4D research project: a real-time non-rigid 3D surface reconstruction algorithm for motion capture.

- **March 2015 - July 2015: Researcher, University Institute for Computer Research, University of Alicante.** Supervisor: Jose Garcia Rodriguez.

Researcher working on the SIRMAVED project, which is a national funded project that aims to promote the health and welfare of society from the design, development and evaluation of a novel therapy of cognitive rehabilitation for people with acquired brain injury or dependent people. This therapy is based on the design and use of an intelligent and active monitoring environment system and a social autonomous robot providing interactive stimulation at home. My primary tasks were:

- Design and specification of the system architecture
- Develop 3D object recognition algorithms that work in cluttered scenes
- Integrate multiple natural user interface (NUI) devices to provide multiple ways to interact with the robotic platform.

- **February 2014 - February 2015: Post-doctorate equivalent, University of Alicante. Computer technology Department.** Supervisors: Jose Garcia Rodriguez and Miguel Cazorla

Post-doctorate researcher working in Computer Vision and Robotics:

- I worked on 3D vision algorithms related to human-machine interaction and object recognition under time constraints using technologies like Kinect 2.0 and CUDA with the Jetson TK1 platform (Embedded platforms).
- I was people manager (PhD and undergrad students) and interacted with externals (academia).

- **January 2011- January 2014: PhD fellowship at the Computer Technology Department, University of Alicante.** Supervisors: Jose Garcia Rodriguez and Miguel Cazorla

The Computer Technology Department at the University of Alicante (UA) is one of the leading laboratories in the world using Graphics Processing Units (GPUs). The University of Alicante (UA) has extensive experience in high performance computing and several of its research groups are now working on algorithms acceleration and research in different fields such as computer vision, robotics, computational intelligence and bioinformatics. The Computing Research Institute has a high-performance multi-nodes computer system available to all research groups.

The University of Alicante acts as a research centre for the leading multinational corporation NVIDIA on visual computing technologies, world renowned for its graphics cards used in PCs and mobile devices. Specifically, UA does research in CUDA the parallel computing architecture

of this company, which uses the high power of the GPU to provide an extraordinary increase in system performance. GPU research center award

During my PhD, I:

- Designed and implemented efficient GPU algorithms for Computer Vision and robotics using CUDA: 3D scene reconstruction, Simultaneous Localization and Mapping and 3D object recognition.
- Developed a new method to create compact, reduced and efficient 3D representations from noisy data. The method is based on the Growing Neural Gas algorithm, which has been extended and redesigned providing several useful capabilities.
- Investigated on the integration of 3D data processing algorithms in complex computer vision systems. Experiments have demonstrated that the General Purpose GPU paradigm allows to considerably accelerate algorithms compared to CPU implementations and to run these in real-time.
- Published papers and participated in conferences and project meetings all across Europe in collaboration with prestigious institutions (University of Edinburgh, University of Westminster, University of Iceland, NILS mobility project, Microsoft Research).
- Was awarded a three year 2011-14 Pre-Doctorate Grant by the Spanish Government (ACIF/2011/143), (74)

- **June 2014 - August 2014: Research internship at Microsoft Research (Multimedia, Interaction, and Communication group) under the direction of Dr. Charles Loop.**

During my PhD I did an internship at Microsoft Research where I carried out research on the development of a real-time multi-view 3D shape acquisition system using GPUs. I focused on the next tasks:

- Research and implementation of a stereo matching technique for high quality depth map generation.
- Designed an efficient architecture for real-time multi-view 3D shape acquisition system using GPUs.
- Researched post-processing techniques for 3D data upsampling and accuracy improvement.

- **June 2012 - November 2012: 5-months research stay at the Computer Vision Group at the University of Edinburgh under the direction of Prof. Robert B. Fisher.**

As a result of the work carried out during the research visit to the Computer Vision Unit, School of Informatics at the Edinburgh University:

- Favourable results were obtained in the use of the GPU to accelerate the computation of a 3D descriptor based on the calculation of 3D semi-local surface patches of 3D partial views.
- Proposal and development of a method for estimating a point light source position in a scene. Realistic rendering on augmented reality applications.
- Positive progress in the field of 3D computer vision algorithms accelerated using hardware implementations.
- Publication of the research carried out at the prestigious British Machine Vision Conference (BMVC) 2013: Point Light Source Estimation based on Scenes Recorded by a RGB-D camera.

- **2012-2013: 2-weeks research stay at the Computer Science and Software Engineering Department at the School of Electronics and Computer Science, University of Westminster. Supervisor: Alexandra Psarrou.**

Short collaboration stays for brainstorming and future collaboration between the University of Alicante and the University on Westminster on the following research topics:

- Improvements of the Growing Neural Gas model for computer vision applications.
- Efficient GPU implementations of existing algorithms used for automatic video annotation.

FELLOWSHIPS,
RESEARCH GRANTS
& AWARDS

- **2011-2015:** Last years I have been using and teaching NVIDIA CUDA technology at the University of Alicante which has been selected as a CUDA Teaching Center during the academic years 2011, 2012, 2013 and 2014 for his commitment demonstrated in the advance of education of NVIDIA CUDA technology. Moreover, recently the University of Alicante has been selected by NVIDIA as a 2014/15 CUDA Research Center.
- **2014:** PhD Defense graded Cum Laude Highest Honors at Universidad de Alicante (UA). Examiners: Prof. A. Psarrou, Prof. M. Graña and Prof. J.M. Garcia-Chamizo.
- **2012:** Pre-Doctorate Grant to fund studies abroad during the PhD given by the Spanish Government.
- **2012:** Research collaboration grant for a 5 month research stay at the Computer Vision Group at the University of Edinburgh. This research stay was funded by the European Network of Excellence on High Performance and Embedded Architecture and Compilation (HiPEAC) June 2012 - December 2012. Favourable results were obtained in the use of the GPU to accelerate the computation of a 3D shape descriptor based on the calculation of 3D semi-local surface patches of partial 3D views.
- **2011:** The CUDA Research Center at the Barcelona Supercomputing Center (BSC) presented an Honorable mention to Sergio Orts-Escolano for his presentation at the poster Session during the Barcelona Computing Week 2011, Programming and Tuning Massively Parallel Systems: GPU Accelerated Growing Neural Gas Network.
- **2011:** Spanish Government grant for Doctoral studies. (2011-2015)

TEACHING
EXPERIENCE

Interfaces for Intelligent Environments, subject in University master's degree in Computing Technologies at the University of Alicante. 2013-2015 (10h per year)

Appliances and infrastructures for multimedia systems, subject in Multimedia Engineering degree (4 year-programme) at the University of Alicante. 2012-2014 (30h per year)

Operating Systems, subject in Multimedia Engineering degree (4 year-programme) at the University of Alicante. 2012-2014 (30h per year)

III Workshop on scientific applications and computer vision on graphics processors at the University of Alicante May 10, 2013

II Summer course on scientific applications and computer vision on graphics processors at the University of Alicante July 22,23,24, 2013

I Summer course on scientific applications and computer vision on graphics processors at the University of Alicante July 10,11,12, 2012

II Workshop on scientific applications and computer vision on graphics processors at the University of Alicante May 10,11, 2012

CUDA Workshop at the University of Alicante, December 16, 2011

Workshop on scientific applications and computer vision on graphics processors at the University of Alicante May 12, 2011

I belong to the research group of **Industrial Informatics and Computer Networks** at the University of Alicante.

Projects participation

- “Development of a comprehensive robotic system for monitoring and interaction for people with acquired brain damage and dependent people.” Spanish national project. (SIRMAVED) (2014-2017).
- “Discovery of novel blood anticoagulants using hybrid artificial intelligence techniques” European project jointly coordinated by the University of Iceland, University of Alicante, and Catholic University of San Antonio in Murcia (2014-2016).
- “Cooperative Simultaneous Localization and Mapping (SLAM) in large scale environments.” Spanish national project. (DPI2009-07144) (2010-2012)
- “Visual surveillance systems for the identification and characterization of anomalous behavior” (GV/2011-2012/034)
- “Visual surveillance system to characterize and identify abnormal behaviours with temporal restrictions” (GRE09/16) (2009)

Reviewer

“Associate Editor of the International Journal of Computer Vision and Image Processing,”
 “Journal of Real-time Image Processing”
 “Parallel computing Journal”
 “Neurocomputing Journal”
 “Applied Soft Computing Journal”
 “International Joint Conference on Neural Networks (IJCNN)”
 “International Work Conference on Artificial Neural Networks (IWANN)”

Scientific Talks & Presentations

- Seminar at University of Iceland (High Performance Computing group): Representation of 3D molecules structure using computer vision and neural methods. Graph-based matching methods.
- Talk at IWINAC 2015, 6th. International Work-Conference on the Interplay between Natural and Artificial Computation: Optimized Representation of 3D Sequences Using Neural Networks.
- Talks at IJCNN 2015, The International Joint Conference on Neural Networks: Using GNG on 3D Object Recognition in Noisy RGB-D data and Processing Point Cloud Sequences with Growing Neural Gas.
- Talk at IWANN 2013, International Work-Conference on Artificial Neural Networks: Point cloud data filtering and downsampling using growing neural gas.
- Talk at IJCNN 2012, International Joint Conference on Neural Networks: Multi-GPU based camera network system keeps privacy using growing neural gas.
- Talk at IWANN 2011, International Work-Conference on Artificial Neural Networks: Fast Image Representation with GPU-Based Growing Neural Gas.

Conference Organization

“International Joint Conference on Neural Networks (IJCNN 2014)”
 “International Joint Conference on Neural Networks (IJCNN 2013)”
 “International Work Conference on Artificial Neural Networks (IWANN 2013)”
 “International Joint Conference on Neural Networks (IJCNN 2012)”.

“15th International Conference of the Catalan Association of Artificial Intelligence”
“International Work Conference on Artificial Neural Networks (IWANN 2011)”

Supervision of undergraduate research students

- Natural Interaction Interfaces for Virtual Reality scenarios using 3D gestures. PhD
- Implementation of 3D Vision algorithms under time constraints: human-computer interaction and object recognition applications. BSc
- TripMinder: Multi-platform application for trip planning. BSc
- Computer Vision tool for automatic detection of skin melanomas. BSc

SOCIETIES/MEMBERSHIPS

- Member of the European Network of Excellence on High Performance and Embedded Architecture and Compilation (HiPEAC)
- Member of the European Network for the Advancement of Artificial Cognitive Systems, Interaction and Robotics (EUCog)
- Member of the International Neural Network Society (INNS)
- Machine Intelligence Research: Scientific network for innovation and research excellence (MIR-Labs)

IN THE NEWS/MEDIA

- Microsoft Holoportation. One of the projects in which I have actively participated as a key member has been massively covered by the press. Press Coverage: ZDNet, TechRadar, Gizmodo, VentureBeat, Mashable, The Verge, Engadget, PC Magazine, Mirror, PC World, Gamasutra, Digital Trends, CNET and more than 50 different technological blogs around all the world. <http://research.microsoft.com/en-us/projects/holoportation/>
- Hipeac: Compilation and Computer Architecture Magazine: Column about the research carried out during my PhD. <https://www.hipeac.net/>

PUBLICATIONS

Google Scholar; Citations: 109, H-index: 7

Journals

1. **Interactive light source position estimation for augmented reality with an RGB-D camera.** Bastiaan J. Boom, Sergio Orts-Escolano, Xin X. Ning, Steven McDonagh, Peter Sandilands, Robert B. Fisher. Computer Animation and Virtual Worlds. DOI: 10.1002/cav.1686 **Impact Factor: 0.463.**
2. **Multi-sensor 3D object dataset for object recognition with full pose estimation.** Garcia-Garcia, A., Orts-Escolano, S., Oprea, S., Garcia-Rodriguez, J., Azorin-Lopez, J., Saval-Calvo, M. & Cazorla, M. (2016) Neural Computing and Applications, pages 1-12 **Impact Factor: 1.569.**
3. **GNG based foot reconstruction for custom footwear manufacturing.** Jimeno-Morenilla, A., Rodríguez, G.J., Orts, S. & Davia-Aracil, M. (2016) Computers in Industry, 75:116-126. doi:10.1016/j.compind.2015.06.002 **Impact Factor: 1.950.**

4. **3DCOMET: 3D compression methods test dataset.** Navarrete, J., Morell, V., Cazorla, M., Viejo, D., Rodríguez, G.J. & Orts-Escolano, S. (2016) *Robotics and Autonomous Systems*, 75:550-557. doi:10.1016/j.robot.2015.09.028 **Impact Factor: 1.583.**
5. **Using GNG on 3D Object Recognition in Noisy RGB-D data.** Rangel, J.C., Morell, V., Cazorla, M., Orts-Escolano, S. & Rodriguez, J.G. (2016) *Formal Pattern Analysis & Applications* **Impact Factor: 0.646.**
6. **Evaluation of sampling method effects in 3D non-rigid registration.** Saval-Calvo, M., Azorin-Lopez, J., Fuster-Guillo, A., Garcia-Rodriguez, J., Orts-Escolano, S. and Garcia-Garcia, A. (2016) *Neural Computing and Applications*, pages 1-15 **Impact Factor: 1.569.**
7. **3D surface reconstruction of noisy point clouds using Growing Neural Gas: Object/Scene reconstruction.** Sergio Orts-Escolano, Jose García-Rodríguez, Vicente Morell-Gimenez, Miguel Cazorla, Jose Antonio Serra Perez. *Neural Processing Letters*. **Impact Factor: 1.448.**
8. **3D Model Reconstruction using Neural Gas Accelerated on GPU.** Sergio Orts-Escolano, Jose García-Rodríguez, Jose Antonio Serra-Perez, Antonio Jimeno-Morenilla, Vicente Morell-Gimenez. *Applied Soft Computing*. doi:10.1016/j.asoc.2015.03.042 **Impact Factor: 3.222.**
9. **Geometric 3D Point Cloud Compression.** Vicente Morell, Sergio Orts Escolano, Miguel Angel Cazorla, Jose Garcia-Rodriguez. *Pattern Recognition Letters*. 05/2014; DOI: 10.1016 **Impact Factor: 1.896.**
10. **3D maps representation using GNG.** Vicente Morell, Miguel Angel Cazorla, Sergio Orts Escolano, Jose Garcia-Rodriguez. *Mathematical Problems in Engineering*. 07/2014; 2014:1-11. DOI: 10.1155/2014/972304 **Impact Factor: 0.762.**
11. **A Comparative Study of Registration Methods for RGB-D Video of Static Scenes.** Vicente Morell-Gimenez, Marcelo Saval-Calvo, Jorge Azorin-Lopez, Jose Garcia-Rodriguez, Sergio Orts-Escolano, Miguel Cazorla. *Sensors*. 05/2014; 14(5):8547-8576. doi:10.3390/s140508547 **Impact Factor: 2.742.**
12. **Real Time Motion Estimation using a Neural Architecture Implemented on GPUs.** Jose Garcia-Rodriguez, Sergio Orts-Escolano, Anastassia Angelopoulou, Alexandra Psarrou, Jorge Azorin-Lopez, Juan Manuel Garcia-Chamizo. *Journal of Real-Time Image Processing*. 2014. ISSN 1861-8200 **Impact Factor: 2.020.**
13. **3D Reconstruction of Medical Images from Slices Automatically Landmarked with Growing Neural Models.** Jose Garcia-Rodriguez, Sergio Orts-Escolano, Anastassia Angelopoulou, Alexandra Psarrou. *Neurocomputing* 2014. **Impact Factor:2.292.**
14. **Parallel Computational Intelligence-Based Multi-Camera Surveillance System.** Sergio Orts-Escolano, Jose Garcia-Rodriguez, Vicente Morell, Miguel Cazorla, Jorge Azorin, Juan Manuel Garcia-Chamizo. *Journal of Sensor and Actuator Networks*. 04/2014; 3(2):95-112.
15. **3D-based reconstruction using growing neural gas landmark: application to rapid prototyping in shoe last manufacturing.** Antonio Jimeno-Morenilla, Jose García-Rodríguez, Sergio Orts-Escolano and Miguel Davia-Aracil. *The International Journal of Advanced Manufacturing Technology*, October 2013, Volume 69, Issue 1-4, pp 657-668. **Impact Factor: 1.458.**
16. **Real-time 3D semi-local surface patch extraction using GPGPU.** Sergio Orts-Escolano, Vicente Morell, Jose Garcia-Rodriguez, Miguel Cazorla, Robert B. Fisher. *Journal of Real-Time Image Processing*. December 2013. DOI 10.1007/s11554-013-0385-7. **Impact Factor: 2.020.**
17. **GPGPU implementation of growing neural gas: Application to 3D scene reconstruction.** Sergio Orts, José García Rodríguez, Diego Viejo, Miguel Cazorla, Vicente Morell. *Journal. Parallel Distrib. Comput.* 72(10): 1361-1372 (2012). **Impact Factor:2.292.**

18. **Autonomous Growing Neural Gas for applications with time constraint: Optimal parameters estimation.** José García-Rodríguez, Anastassia Angelopoulou, J.M. García-Chamizo, Alexandra Psarrou, S. Orts Escolano, V. Morell Giménez. Journal Neural Networks. 2012. **Impact Factor:2.729.**

Congresses and Conferences

1. **Fusion4D: Real-time Performance Capture of Challenging Scenes.** Dou, M., Khamis, S., Degtyarev, Y., Davidson, P., Fanello, S., Kowdle, A., Escolano, S.O., Rhemann, C., Kim, D., Taylor, J., Kohli, P., Tankovich, V. & Izadi, S. (2016), SIGGRAPH 16
2. **HyperDepth: Learning Depth from Structured Light Without Matching.** Fanello, S., Rhemann, C., Tankovich, V., Kowdle, A., Escolano, S.O., Kim, D. & Izadi, S. (2016), Computer Vision and Pattern Recognition (CVPR 2016)
3. **Registration methods for RGB-D cameras accelerated on GPUs.** Montoyo, J., Morell, V., Cazorla, M., Garcia-Rodriguez, J. & Escolano, S.O. (2014)In ISR/Robotik 2014; 41st International Symposium on Robotics; Proceedings of, pages 1-8
4. **Self-Organizing Activity Description Map to represent and classify human behaviour.** López, A.J., Saval-Calvo, M., Guilló, F.A., Rodríguez, G.J. & Orts-Escolano, S. (2015) 2015 International Joint Conference on Neural Networks, IJCNN 2015, Killarney, Ireland, July 12-17, 2015, pages 1-7, IEEE
5. **Support Vector Machines Prediction of drug solubility on GPUs.** Gaspar Cano; Jose García Rodríguez; Sergio Orts Escolano; Alfonso Perez Garrido. International Work-Conference on Bioinformatics and Biomedical Engineering, IWBBIO, 2015.
6. **Optimized Representation of 3D Sequences Using Neural Networks.** Orts-Escolano, S., Rodriguez, J.G., Morell, V., Cazorla, M., Garcia-Garcia, A. & Ovidiu-Oprea, S. (2015)In Bioinspired Computation in Artificial Systems - International Work-Conference on the Interplay Between Natural and Artificial Computation, IWINAC 2015, Elche, Spain, June 1-5, 2015, Proceedings, Part II, pages 251-260
7. **Processing point cloud sequences with Growing Neural Gas.** Orts-Escolano, S., Rodriguez, J.G., Morell, V., Cazorla, M., Saval-Calvo, M. & López, J.A. (2015)In 2015 International Joint Conference on Neural Networks, IJCNN 2015, Killarney, Ireland, July 12-17, 2015, pages 1-8
8. **Object Recognition in Noisy RGB-D Data.** Rangel, J.C., Morell, V., Cazorla, M., Orts-Escolano, S. & Rodriguez, J.G. (2015)In Bioinspired Computation in Artificial Systems - International Work-Conference on the Interplay Between Natural and Artificial Computation, IWINAC 2015, Elche, Spain, June 1-5, 2015, Proceedings, Part II, pages 261-270
9. **Using GNG on 3D Object Recognition in Noisy RGB-D data.** Rangel, J.C., Morell, V., Cazorla, M., Orts-Escolano, S. & Rodriguez, J.G. (2015)In 2015 International Joint Conference on Neural Networks, IJCNN 2015, Killarney, Ireland, July 12-17, 2015, pages 1-7
10. **Non-rigid point set registration using color and data downsampling.** Saval-Calvo, M., Orts-Escolano, S., López, A.J., Rodríguez, G.J., Guilló, F.A., Morell-Giménez, V. & Cazorla, M. (2015) 2015 International Joint Conference on Neural Networks, IJCNN 2015, Killarney, Ireland, July 12-17, 2015, pages 1-8, IEEE
11. **A Comparative Study of Downsampling Techniques for Non-rigid Point Set Registration Using Color.** Saval-Calvo, M., Orts-Escolano, S., López, J.A., Rodriguez, J.G., Guilló, A.F., Morell-Giménez, V. & Cazorla, M. (2015)In Bioinspired Computation in Artificial Systems - International Work-Conference on the Interplay Between Natural and Artificial Computation, IWINAC 2015, Elche, Spain, June 1-5, 2015, Proceedings, Part II, pages 281-290

12. **3D colour object reconstruction based on Growing Neural Gas.** Sergio Orts-Escolano, Jose Garcia-Rodriguez, Vicente Moreli, Miguel Cazorla, Juan Manuel Garcia-Chamizo. Neural Networks (IJCNN), 2014.
13. **3D data compression for RGB-D data.** Vicente Morell-Giménez, Miguel Cazorla, Sergio Orts-Escolano, Jose García-Rodríguez. Proceedings of the 15th Workshop of Physical Agents. 2014
14. **Registration methods for RGB-D cameras accelerated on GPUs.** Javier Montoyo, Vicente Morell, Miguel Cazorla, Jose Garcia-Rodriguez, Sergio Orts Escolano. ISR/Robotik 2014.
15. **Point Light Source Estimation based on Scenes Recorded by a RGB-D camera.** Bas Boom, Sergio Orts-Escolano, Xi Ning, Steven McDonagh, Peter Sandilands, Robert Fisher. British Machine Vision Conference (BMVC 2013).
16. **Natural User Interfaces in Volume Visualisation Using Microsoft Kinect.** Anastassia Angelopoulou, Bharat Reddy, Jose Garcia-Rodriguez, Markos Mentzelopoulos, Sergio Orts-Escolano. IEEE ICIAP-International Congress on Image Analysis an Processing, 2013.
17. **Improving Drug Discovery using a neural networks based parallel scoring functions.** Horacio Perez-Sanchez, Gines D. Guerrero, Jose M. Garcia, Jorge Pena, Jose M. Cecilia, Sergio Orts-Escolano and Jose Garcia-Rodriguez. International Joint Conference on Neural Networks (IJCNN 2013).
18. **Point Cloud Data Filtering and Downsampling using Growing Neural Gas.** Sergio Orts-Escolano, Vicente Morell, José Garcia-Rodriguez and Miguel Cazorla, International Joint Conference on Neural Networks (IJCNN 2013).
19. **Improving 3D Keypoint Detection from Noisy Data Using Growing Neural Gas.** José García-Rodriguez, Miguel Cazorla, Sergio Orts-Escolano and Vicente Morell. Interionational Work Conference on Artificial Neural Networks (IWANN 2013): 480-487.
20. **A study of registration techniques for 6DoF SLAM.** Vicente Morell, Miguel Cazorla, Diego Viejo, Sergio Orts, José García Rodríguez. Catalan Artificial Intelligence Association (CCIA 2012): 111-120
21. **Multi-GPU Based Camera Network System Keeps Privacy using Growing Neural Gas.** Sergio Orts-Escolano, Jose Garcia-Rodriguez, Vicente Morell-Gimenez, Jorge Azorin-Lopez and Juan Manuel Garcia-Chamizo. International Joint Conference on Neural Networks (IJCNN 2012).
22. **Fast Autonomous Growing Neural Gas.** Garcia-Rodriguez, J.; Angelopoulou, A.; Garcia-Chamizo, J.M.; Psarrou, A.; Orts-Escolano, S.; Morell-Gimenez, V.; Neural Networks (IJCNN), International Joint Conference on Neural Networks (IJCNN 2011).
23. **Video and Image Processing with Self-Organizing Neural Networks.** Jose Garcia Rodriguez, Enrique Dominguez, Anastassia Angelopoulou, Alexandra Psarrou, Francisco José Mora-Gimeno, Sergio Orts, Juan Manuel García Chamizo. Interionational Work Conference on Artificial Neural Networks IWANN (2) 2011: 98-104.
24. **Fast Image Representation with GPU-Based Growing Neural Gas.** José García Rodríguez, Anastassia Angelopoulou, Vicente Morell, Sergio Orts, Alexandra Psarrou, Juan Manuel García Chamizo. Interionational Work Conference on Artificial Neural Networks IWANN (2) 2011: 58-65

Book Chapters

1. **Review of Registration Methods on Mobile Robots.** Morell-Gimenez, Vicente, Orts-Escolano, Sergio, García-Rodríguez, Jose, Cazorla, Miguel, Robotic Vision: Technologies for

Machine Learning and Vision Applications. pp. 142 - 155. IGI GLOBAL, 2012. ISBN 9781466626720

2. **Computer Vision Applications of Self-Organizing Neural Networks.** García-Rodríguez, Jose; García-Chamizo, Juan Manuel; Orts-Escolano, Sergio; Morell-Gimenez, Vicente; Angelopolou, Anastassia; Cazorla, Miguel. Robotic Vision: Technologies for Machine Learning and Vision Applications. pp. 131 - 140. IGI GLOBAL, 2012. ISBN 9781466626720

Poster presentations

1. **6DoF pose estimation using Growing Neural Gas Network.** Sergio Orts, José García-Rodríguez, Diego Viejo, Miguel Cazorla, Vicente Morell, José Serra. 5th International Conference on Cognitive Systems, TU Vienna, Austria. Poster presentation
2. **GPU Accelerated Growing Neural Gas Network.** Sergio Orts, José García-Rodríguez, Vicente Morell. Programming and Tuning Massively Parallel Systems, Barcelona Spain, July 2011. Poster presentation (Honorable Mention).

OTHER EXPERIENCE

- Contributor of the Point Cloud Library (PCL). It is a standalone, large scale, open project for 2D/3D image and point cloud processing.
- Experience building low-cost 3D printers (Prusa models) and creating 3D parts using Blender and other CAD tools.
- Freelance web application developer using Grails technology.

LANGUAGES

Spanish. Native.

English. Fluent. C1 by the University of Alicante in 2013 and I also obtained the FCE from Cambridge University in 2012.

Catalan. Fluent. .

PROFESSIONAL EXPERIENCE

Research internship at Microsoft Research (MSR). (3 months), Redmond, Washington (June-September 2014). Multimedia, Interaction and Communication group (MIC)

“Development of a real-time multi-view 3D shape acquisition system using GPUs”.

Programmer at Caja Mediterráneo (Savings Bank). 2010 (1 year), Alicante, Spain
Department of new technologies. Architecture and security,

“Application development for the company intranet using Java. Application for the monitoring of banking transactions and generation of statistical graphs.”.

“Participation in the development of a programming environment (IDE) for COBOL using Eclipse framework and Java technology. Fixing bugs and improving interfaces.”.