

CURRICULUM VITAE

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Education

Date	Title
2006 - 2010	European PhD in Computer Science: Title: "AFreeCA: an architecture to implement Collaborative Virtual Environments" (written in English) Supervisors: Pascual González López, José Pascual Molina Massó Organism: University of Castilla- La Mancha (The applicant was awarded a four years FPI grant by the Junta de Comunidades de Castilla- La Mancha to support his PhD)
23/05/2007	MsC (Diploma de Estudios Avanzados) by the University of Castilla- La Mancha
2000 - 2005	Degree in Computer Science by the University of Castilla- La Mancha

Research Interests

My research interest was initially focused on Collaborative Virtual Environments (CVEs), but it shifted towards creating interactive systems with similar affordances (collaboration, 3D contents and interaction) but avoiding cumbersome devices, such as head-mounted devices or data gloves. My approach mixes elements from 3D displays and Virtual Reality, with the implementation of novel interactive systems and user testing. This has demanded mastering knowledge from very different fields, such as software engineering, 3D graphics and visualization, physics, optics, electronics and human computer interaction. This knowledge has been applied to the creation of several systems, such as MisTable, PIVOT, AFreeCA or SensaBubble.

Technical Skills

- Excellent programming skills in C++. I have a preference for multiplatform libraries (stl, pthread, boost, etc.), but would be able to use others.
- Experience with microcontrollers (Arduino, XMOS) to build several systems, such as the fog distribution system in MisTable, actuated parallax barriers, drop control mechanisms.
- Experience with Image processing: I have used image processing to implement several types of tracking systems (e.g. visual tracking with ARToolkitPlus, head and hand trackers with Kinect, drop detection, tracking and estimation). I also have some experience using USB and Firewire cameras.
- Experience with VR hardware: trackers (OptiTrack, Flock of Birds, Intersense IS900, etc.), data-gloves (pinchgloves, cyberglove, NoDNA X-IST, P5, etc.), head-mounted devices (VR-1280, i-glasses, ProView XL35), rear projection screens, active and passive stereo, joysticks, wandas, etc.

- Experience with VR device management libraries: I have used VRPN, OpenInterface and VRJuggler to manage VR input devices. I have also used specific drivers for some devices, such as the wiimote, Kinect, Leap, CyberForce, LabView devices, etc.
- Experience with physics engines and collision management libraries: I have used Open Dynamics Engine (ODE) to manage collision detection and physics simulation in AFreeCA. I also have some experience with other similar libraries such as Bullet, Sion Tower Collision, etc.
- Experience with 3D graphics engines: I used Ogre3D to create a plug-in to manage 3D rendering in AFreeCA. I also have some experience with OpenSceneGraph.
- Experience with 3D sound libraries: I used OpenAL to manage 3D sound in AFreeCA
- Some 3D modelling capabilities using Blender.
- Experience with other programming languages (Java, C#, Visual Basic, haskell, prolog, etc.)

Professional Experience

Dates	Employer	Job	Task
02/2012-present	University of Bristol	Research Assistant	Exploring the design and implementation of multi-touch surfaces with true-3D displays. Understanding how interaction can be facilitated on a surface that combines 2D and 3D display.
04/2005-09/2005	UCLM	Scientific programmer	Image analysis of very large images on a cluster using MPI, BLACS and ScaLAPACK.
03/2006-09/2006	UCLM & Eurocopter Spain	Programmer	Development of a system for the automatic generation of test programs for helicopters. The program read a script language and generated C programs that tested the operation of one of the control units of the helicopters.
10/2006 - 04/2007	UCLM	Programmer	Development of VRPrismaker: an educational VR platform that replicated the real game Prismaker. The system was modified afterwards to include multiuser support.

Most Relevant Publications

Martinez D., Berthaut, F., Karnik, A., Subramanian, S., *Through the combining glass*, Proceedings of ACM UIST 2014, 27th ACM User Interface Software and Technology Symposium. ACM, New York, NY, USA, 341-350.

Martinez, D., Martinez, J., Karnik, A., Subramanian, S., *Portallax: bringing 3D displays capabilities to handhelds*, Proceedings of MobileHCI '14. ACM, New York, NY, USA, 145-154.

Martinez, D., Joyce, E., and Subramanian, S., 2014. *MisTable: reach-through personal screens for tabletops*. In Proceedings of the 32nd annual ACM conference on Human factors in computing systems (CHI '14). ACM, New York, NY, USA, 3493-3502. DOI=10.1145/2556288.2557325 <http://doi.acm.org/10.1145/2556288.2557325> **CORE A**

Seah, S. A., **Martinez, D.**, Bennet, P., Karnik, A., Otrocol, V., Knibbe, J., Cockburn, A., Subramanian, S., *SensaBubble: A Chrono-Sensory Mid-Air Display of Sight and Smell*". In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '14). ACM, New York, NY, USA, 2863-2872. DOI=10.1145/2556288.2557087 <http://doi.acm.org/10.1145/2556288.2557087> **CORE A**

Karnik, A., **Martinez, D.**, Mayol-Cuevas, W., and Subramanian, S., "*PiVOT: personalized view-overlays for tabletops*". In Proceedings of the 25th annual ACM symposium on User interface software and technology (UIST '12). ACM, New York, NY, USA, 271-280.
DOI=10.1145/2380116.2380151 <http://doi.acm.org/10.1145/2380116.2380151> **CORE: A**

Martínez, D., Lawson, J-Y., Molina, J.P., García, A.S., González, P., Vanderdonckt, J., Macq B., "*A Framework to Develop VR Interaction Techniques Based on OpenInterface and AFreeCA*", In Proceedings of the 13th IFIP TC 13 international conference on Human-computer interaction - Volume Part III (INTERACT'11), Pedro Campos, Nuno Nunes, Nicholas Graham, Joaquim Jorge, and Philippe Palanque (Eds.), Vol. Part III. Springer-Verlag, Berlin, Heidelberg, 1-18. **CORE: A**

Martínez, D., Kieffer, S., Martínez, J., Molina, J. P., Macq, B., González, P. "*Usability evaluation of virtual reality interaction techniques for positioning and manoeuvring in reduced, manipulation-oriented environments*", The Visual Computer Vol. 26, num. 6-8, pp. 619-628, 2010, ISSN: 0178-2789, **JCR:0,786**.

Martinez, D., Molina, J.P., Garcia, A.S., Martinez, J., Gonzalez, P., "*AFreeCA: Extending the Spatial Model of Interaction*", *Cyberworlds (CW)*, 2010 International Conference on , vol., no., pp.17,24, 20-22 Oct. 2010, doi: 10.1109/CW.2010.63 **CORE: B**

Research Projects

Title: **Interactive Systems Involving Multi-point Surfaces, Haptics and true-3D displays**

Supporting Entity: European Research Council. Starting grant agreement (278576)

Universities: University of Bristol

Duration (from-to): (2012-2014)

Main Researcher: Professor Sriram Subramaniam.

Researchers: 15

Title: **Entornos virtuales colaborativos aplicados a sistemas de aprendizaje (PAI06-0093-8836)**

Supporting Entity: Junta de Comunidades de Castilla-La Mancha and Fondo Social Europeo

Universities: Univ. de Castilla-La Mancha, Univ. Miguel Hernández

Duration (from-to): (2006-2008)

Main Researcher: Professor. Pascual González López.

Researchers: 15

Title: **ADACO/ entornos colaborativos: metodologías de desarrollo de interfaces adaptativas**

Supporting Entity: Ministerio de Educación y Ciencia

Universities: Univ. de Castilla-La Mancha

Duration (from-to): (15/04/2007 - 31/12/2007)

Main Researcher: Professor Pascual González López.

Researchers: 12

Title: **Calidad, adaptacion y nuevos paradigmas aplicados a sistemas colaborativos**

Supporting Entity: Ministerio de Educación y Ciencia

Universities: Univ. de Castilla-La Mancha, Univ. de Granada and Univ. of Lleida

Duration (from-to): (2009 - 2011)

Main Researcher: Professor Pascual González López.

Researchers: 22

Title: **Nuevos entornos y paradigmas de interacción**

Supporting Entity: Junta de Comunidades de Castilla-La Mancha

Universities: Univ. de Castilla-La Mancha, Univ. Miguel Hernández

Duration (from-to): (2007 - 2010)

Main Researcher: Professor Pascual González López.

Researchers: 15

Scientific stays at foreign universities

The applicant has collaborated with researchers from the Laboratoire de Teledetections et Telecommunications (UCL-TELE) of the University of Louvain-La Neuve (UCL) and has stayed at that university for two periods of three months (from 01/09/2008 to 01/12/2008 and from 15/03/2009 to 15/06/2009). During these periods, the OpenInterface platform –a workbench for the graphical prototyping of multimodal applications- was integrated with the CVE development platform being created by the applicant. In order to illustrate the correct operation of the integration, a usability evaluation of different VR interaction techniques was undertaken. All this work resulted in the publication of two papers, one at The Visual Computer journal and another one at the Interact 2011 conference.

Teaching Experience

Date	Subject	Credits	Contents
2007-2008 2009-2010	Informatica Gráfica	3 (practice)	OpenGL rendering pipeline, mathematics for computer graphics
2010-2011	Diseño de Software	3 (theory)	Advanced programming in Java, design patterns (Gang of Four)
2010-2011 2011-2012	Ingeniería de Software	3 (practice)	Introduction to software engineering, UML.
2011-2012	Bases de Datos	3 (practice)	Introduction to data base design and implementation with PL-SQL