Curriculum Vitae – Francisco Lopez Luro
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Personal Statement

I think that education is a fundamental part of a healthy society and that is why I have chosen to develop myself academically. Because of that, most of my work experience has been within Academia, where I have been able to develop as a teacher and researcher, gaining many personal and collective outcomes. I have always felt very comfortable in a multidisciplinary group environment, where it is possible to share ideas and knowledge and learn new things.

Work Experience

- May 2017 to Present
  Phd student at the Department of Creative Technologies, in the Blekinge Technical Institute.
  As part of my development at BTH, I am currently a Phd student part time. My area of research is within Virtual Reality and Eye-Tracking, focusing on visualisation techniques of 3D Gaze information, as well as other new challenges that arise from the recent integrations of high-quality eye-tracking solutions in Virtual Reality HMDs.

- July 2014 to Present
  Adjunct Teacher at Blekinge Institute of Technology, Sweden (full-time)
  I am permanently employed by BTH. I am teaching and developing courses, designing assignments and giving seminars to students in the Technical Artist Programme and the Master in Civil Engineer for Games Programme.

- May 2014 to July 2014
  High School teacher in Maths and Informatics for Sunrise School
  I taught a few hours a week in a Bilingual highschool Maths and Information Techonology to prepare students for the IGCSE (Cambridge's International qualification for 14-16 years old).

- May 2014 to July 2014
  Consultancy on Software development for the National Technological University (UTN-FNR)
  I gave a short term consultancy for the design of an application framework for the creation of custom applications to teach basic Chemistry concepts for undergraduates, but extensible to other disciplines. The framework is a data-driven game using JMonkey3D and will allow for automatic exercise and exam generation based on textual (YAML) descriptions.

- September 2012 to July 2014
  Teaching Assistant at Universidad Nacional del Comahue, Argentina (full-time)
  I have worked as an Assistant Teacher for the Computer Engineering department. During this period I taught "Introduction to Computers" and "Computer Organisation and Architecture" (Hennesy and Patterson books). The first one is an introductory course to all the courses taught by the department, whilst the latter is a core course on computer architecture with a very traditional approach.

- September 2011 to September 2012
  Adjunct Teacher at Blekinge Institute of Technology, Sweden (full-time)
  I taught for one year at the BTH Institute, where I was involved in courses belonging to Game Development, Technical Artists and Engineering programmes. I worked on the following courses/topics: C++ for Engineers, Game Engine Architecture Design, Graphics Programming, Scripting for Animation (Maya and Python) and Scripting for Animation II. I also acted as an assistant in Object Oriented Design for Games and AI for Games. I developed course material, taught theory, labs and prepared exams.

- September 2010 to September 2011
  Graduate Software Engineer at Imagination Technologies (full-time)
  My duties were related with the design and development of software simulation models for hardware IP cores developed in the PowerVR visual division of the company. For this I did use mainly C++ and SystemC. In this role, I have improved my experience using software revision control, Octave/Matlab for research activities, C++ for hardware simulation models, Perl for automation and scripting and HTML5+Javascript for interactive visualization of tests results.

- March 2010 to September 2010
  Mobile Application Developer – Freelance
  Developed a multimedia application for iPhone for Airgid Ltd. This application has not been published due to factors out of my reach which can be further explained. The application used core multimedia features of iOS for playing Videos and Audio, and XML for all the configuration of the game behavior.

- March 2003 to July 2003
  Teaching Assistant (TA) (part-time, ad-honorem) in a Computer Graphics course in a Computer Sciences Bachelor degree at *Universidad Nacional del Comahue, Neuquén, Argentina.* The course takes one semester and 12 hours a week of theory and practice sessions.

- January 2005 to September 2007
  Teaching Assistant (TA) (part-time) in a *Computer Sciences Bachelor degree at Universidad Nacional del Comahue, Neuquén, Argentina.*
  Courses covered: **Networks and Teleprocessing, Operating Systems, Computer Organization and Computer Architecture.** Each course takes one semester and 12 hours a week of theory and practice lectures.

- February 2006 to September 2007
  Research Assistant (full-time) in the project "Software for Learning and Collaborative Processes E04/065" at *Universidad Nacional del Comahue*.

- July 2004 to July 2006
  Oracle DBA Instructor (part-time) at PROYDESA and *Universidad Nacional del Comahue*. This was a technical career of DBA, running for 2 years with a load of 4 hours a week, for undergraduate students.

- September 2009 to September 2011
  Research Assistant (part-time) in the project "High Performance Computing 04/E085" at *Universidad Nacional del Comahue.*

Education

- I started my postgraduate studies in September 2007, at the Technical University of Valencia, Spain, with a scholarship from the Argentine government and the institution *Fundación Carolina* from Spain. *The scholarship* was full time during the first two years for the MSc and part time to finish a PhD in Human Visual Perception.
- I am currently restarting my PhD research in a different line and institution, and my supervisor is Dr. Veronica Sundstedt and my co-supervisor Dr. Hans Tap, both from BTH.
  My area of research is within Virtual Reality and Eye-Tracking, focusing on visualisation techniques of 3D Gaze information, as well as other new challenges that arise from the recent integrations of high-quality eye-tracking solutions in Virtual Reality HMDs.
- December 2009, **M.Sc in Computer Sciences in the Program "IARFID"** (Artificial Intelligence, Pattern Recognition and Digital Image) at the Technical University of Valencia (UPV). The line research during the M.Sc was on Computer Graphics, under the supervision of Dr Ramón Mollá, from the Computer Graphics Group of the UPV. I graduated with an average grade of 8.94/10.
- December 2006, **BSc in Computer Sciences** at *Universidad Nacional del Comahue*, Neuquén, Argentina. Graduated with an average grade of 8.74/10.
- July 2006, **Oracle Database Administration (DBA) Instructor** (with a Scholarship) RED PROYDESA and Universidad Nacional del Comahue
- December 2005, **CCNA Networking Basics**, **CISCO technologies** (with a Scholarship) RED PROYDESA and Universidad Nacional del Comahue.

Research Areas

During my undergraduate studies in Argentina and after graduating, I performed research on the design and development of Remote Laboratories for distance learning using Java and related technologies. The results of this research provided students in graduate and undergraduate levels with new learning tools and paradigms that expanded their possibilities to access new technologies.

This research included Grid Technology, Virtual Laboratories setup, Networking laboratories with mixed (virtual and physical) devices, remote programming of Lego robots and Virtualization technologies (XEN and QEMU). From February 2006 to September 2007 I worked in my university as a full time researcher in this area with a university grant.

After starting my postgraduate studies, I focused my interests in Computer Graphics, Game Development and Human Visual Perception. My focus on research today is on the quality perception of 3D and 2D graphics in interactive applications (mainly Computer Games). My assumptions are that there must be a loss of ability to perceive quality details in irrelevant parts of a synthetic scene when the user is performing a top-down visual process, such as in FPS games and visual cognitive tasks. The main challenge in my line of research is how to measure (if any) the loss of perception in such situations without the users knowing that they are being studied.

Exploiting such deficiencies in the human visual system could be a huge advantage in the process of game development and provide useful tools and recommendations for performance improvement and an efficient usage of available computational resources.

As a secondary line, and a consequence of studying the eye-computer interaction, eye-tracking technologies have become a topic highly related and needed for my research. I am interested in the design and construction of low-cost eye-trackers, and algorithm development for them. When approaching this task, several computer vision algorithms run as part of the eye-tracking process, the design and implementation of massive parallel algorithms for GPUs seems imperative, and is a line which I am starting to study now. I am interested as well in studying gaze behavior and gaze interaction techniques in Computer Games, such as a seamless calibration process of an eye-tracker, and automatic drift correction (continuous auto-calibration during normal usage) in eye-trackers.

International Program Committee Member

- Peer reviewer at GRAPP 2012, International Conference on Computer Graphics Theory and Applications, Roma, Italia, February 24-26, 2012
- Peer reviewer at NGCA '11 2011 Conference on Novel Gaze-Controlled Applications Karlskrona, Sweden – May 26 - 27, 2011.

Selected Publications

- **Lopez, F.**, Mollá, R. and Sundstedt, V. Exploring Peripheral LOD Change Detections during interactive Gaming Tasks. 7th Symposium on Applied Perception in Graphics and Visualization. Pages 73-80. Los Angeles, USA. July 2010. ISBN 978-1-4503-0248-7.

- **Lopez, F.** and Mollá, R. and Barona I. Exploiting Human Visual Peripheral Characteristics on 3D real-time Computer Applications. Eurographics 2009 – Animate and Illuminate. Dublin, Ireland. December 2009. POSTER.

- Barona I., Mollá R., **Lopez F**., Juan M. Carmen. Use of LoD techniques in luminance changes on Video Games. GAMEON. Pages 17-21. Valencia, Spain. November 2008.

- Grosclaude, E., **Lopez, F**. and Bertogna, M. Grid virtual laboratory architecture. Euro-Par 2007 Workshops: Parallel Processing. Pages 164-173. Springer-Verlag Berlin Heidelberg, 2008. ISBN 978-3-540-78472-2.

- Bertogna L., **Lopez F.**, Grosclaude E., Naiouf, M., De Giusti, A. Experience with a Virtual Laboratory Environment Using Grid. 1st Iberian Grid Infrastructure Conference. Pages 381-384. Santiago de Compostela, Spain. May 2007. ISBN 978-84-611-6634-3.

Teaching Experience

During my undergraduate studies, in 2003, I started my teaching activities *ad honorem* as TA in a Computer Graphics course, which gave me the first impressions regarding teaching in higher education. During this course, I was responsible for the course-work development, lecturing specific topics of the syllabus and marking all the programming tasks developed by the students.

This computer graphics course involved classic concepts about 3D programming, including developing applications in C++ and OpenGL on a Linux platform. Topics such as Bezier curves and surfaces, animation, lighting and texturing and basic mesh data manipulation were also covered. Back in that time, we were still using fixed pipeline!

After formally applying for a TA position in my university, I moved to another area in my faculty, responsible for the courses related with Computer Systems, including Operating Systems, Computer Architecture, Computer Organization and Networks and Teleprocessing. During this period, I had to teach foundational concepts on computers systems, such as computer architecture, assembly language, C language programming, operating systems internals and management (Linux), network programming and Internet protocols.

During my stay in Europe, I had the opportunity to work as Adjunct Teacher at the BTH University in Sweden, where I had to assist other senior teachers and also to prepare and give lectures on specific courses. This was an amazing learning experience, where I had to work very hard to succeed.

As of today, I am back at BTH and teaching in a similar role as my last period in this institution. Nevertheless, my responsibilities this time have increased and now I am running two courses on my own including development, teaching, assignment writing and marking.

Postgraduate Courses

The following courses and their respective ECTs load are from the M.Sc IARFID at the Technical University of Valencia, which has a European Community Quality Distinction award:

Computer Graphics (6c), Graphics Programming (4c), 3D Vision and Movement (2c), Virtual and Augmented Reality (2c), Advances in Computer Graphics (2c), Digital Image Production (6c), Vision Systems (6c), Image Recognition (2c), Statistical Pattern Analysis (3c), Learning and Perception (4.5c), Introduction to Pattern Recognition (6c), Learning (6c), Introduction to Artificial Intelligence (4.5c), Medical Informatics (6c), Neural Networks (6c), Computational Linguistics (3c) and Real Time Scheduling of Intelligent Systems (6c).

Previous courses taken in Argentina:
Grid Computing, Advanced SQL, Linux Traffic Control, Java Support for distributed applications, Design Patterns, Computer Vision, Tools for Knowledge Representation for Planning.

Multimedia Applications and Game Development

I have experience planning and developing multimedia and interactive applications. My undergraduate dissertation (mandatory in my university) covered the design and development of an Object Oriented Framework (OOF) in Java to provide access to physical and virtual remote laboratories. Theoretically, within these laboratories a large variety of resources could be found, including cameras, robots, or any other scarce resource which does not use standard protocols of communication and needs to be accessed remotely.

The OOF was used in my university to research on collaborative distance learning for programming of Lego robots and for automatic setup and access to virtual networking laboratories as well.

During my Masters studies, I worked in computer graphics and machine learning applications. In particular for my area of research, I used C++ and the OpenSceneGraph library to develop an experimental framework for quality perception of Level of Detail (LoD) changes in FPS games. This small game was used to run several experiments and the results were published at APGV'10 (see publications). A partial integration with an existing Eyelink II eye-tracker was done during a short stay (2 days) at Trinity College, Dublin. A short demo of what the game looks like can be viewed at: *http://www.youtube.com/watch?v=Qb312WsNhTc*

After moving to London in 2010, I started working as freelance developer for mobile applications (IPhone), and developed a multimedia application (story line based in video clips and questionnaires) for Airgid Ltd. which did not reach the Apple Store for some restrictions on the contents enforced by Apple.

Currently I am developing an experimental framework for my research using Python and the game engine Panda3D from Carnegie Mellon's Entertainment Technology Center and Disney. The purpose of the game is to study how difficulty in a task could affect the perception of quality in the graphics (textures in this case), and it will be used to perform experiments in Spain (UPV), Argentina (my home University) and possibly Sweden (Under the co-supervision of Dr Veronica Sundstedt).

Social Skills

- I have an ease to express ideas and opinions without causing conflict.
- I consider myself a very versatile professional and a quick learner in all areas related with CS and Maths.
- I worked with research groups at my home university and published several papers, gaining experience and work-group mentality.
- I have a positive attitude towards new challenges and a good predisposition and ability to study unknown topics.
- I have played Basketball for 13 years, in a high level of competition, and I have acquired a high sense of sportsmanship and group work.

Technical Skills

- Linux, Windows and OSX operating system usage and administration.
- Experience programming in C, C++, Java, Javascript, Python, Perl, XML, HTML5, Assembler (MIPS), SQL, Octave/Matlab, Bash and Awk. My main programming languages today would be Java, C/C++ and Python.
- iPhone platform programming using XCode and Objective-C and core iOS SDK (no third party libraries)
- Basic knowledge writing GPU shaders (Cg) and CUDA for general purpose GPU programming.
- Abilities for text processing through scripting in Python, Perl, AWK and Bash, for automatic data corpus manipulation.
- Network programming in C (ipc/tcp/udp sockets, http servers) and Computer Graphics programming in C, C++ and Python.
- Libraries that I have used for developing 3D applications, mostly on Linux/i386 platform and MacOSX: OpenGL, OpenSceneGraph, OpenAudio Library and Panda3D, GamePlay3D, Maya Python API, PyMEL and Maya C++ API.
- myAcademic experience in Virtualization technologies on Linux, with two publications in the subject.