Résumé of Miguel Sainz - EXTENDED VERSION

Work Address

2/F, Building 1310,
Arlington Business Park
Theale, Reading, Berkshire
RG7 4SA, UK

Phone: T.B.D.
Cell: T.B.D.
e-mail: msainz@acm.org
web: www.msainz.org

Résumé updated on July 2004.

Professional Goals

To work in a production environment developing tools and new technologies in the areas of computer graphics and image processing.

Education

1999 - 2003 **University of California, Irvine.** Doctor of Philosophy in Electrical and Computer Engineering. The Henry Samueli School of Engineering, Dept. of Electrical Engineering and Computer Science. Degree achieved on July 8th, 2003.

1996-1997 **Technical University of Catalonia (UPC)**, **Barcelona, Spain.** 17 (out of 32) credits of the Ph.D. Program in Perception and Control Systems Engineering.

1994 - 1996 **Cybernetics Institute (IC), Barcelona, Spain**. Master of Science degree in Electrical and Electronic Engineering. Project Title: "Automatic Learning of Industrial Models Using Computer Vision, and its Application to Traffic Sign Recognition". Awarded scholarship from the IC internal program.

1988 - 1994 **Technical University of Catalonia (UPC)**, **Barcelona, Spain**. Bachelor degree in Electrical Engineering with major in power electronics.

Work Experience

07/04 - pres. **Developer Technology Engineer**. NVIDIA Corporation, European Division. Providing technical support to developers on graphics and NVIDIA hardware.

07/03 - 07/04 **Postdoctoral Researcher**. School of Information and Computer Science, University of California, Irvine. Researching and teaching in computer graphics and computer vision.

09/99 - 07/03 **Graduate Research Assistant**. Electrical and Computer Engineering Dept., The Henry Samueli School of Engineering, University of California, Irvine, CA. Researching on Image Based Modeling and Rendering techniques.

12/98 - 07/99 **Java Instructor**, Trainning Services Department of Sun Microsystems, Barcelona, Spain. Teaching on-site programming courses for IT companies.

09/98 - 01/99 **Instructor**. Multimedia engineering, computer graphics and virtual reality. Center for Integration of Technologies and Media (CiTEM), La Salle School of Engineering, Ramon Llull University, Barcelona, Spain. Researching and teaching in computer graphics

03/98 - 09/98 **Research Engineer**. Technical University of Catalonia (UPC), Computer Graphics Section, Barcelona, Spain. Developing Computer Graphics projects for industrial partners.

07/96 - 01/98 **Research Engineer**, Technical University of Catalonia (UPC), Robotics and Informatics Institute, Barcelona, Spain. Developing Computer Vision projects for industrial partners.

01/93 - 06/96 **Research Student**, Cybernetics Institute (IC), Barcelona, Spain. Researching in Computer Vision.

Awards

07/03 - 07/04 **UC Faculty Fellowship**. School of Information and Computer Science, University of California, Irvine, CA.

04/03 - 07/03 **Dissertation Fellowship Award**. Department Electrical and Computer Engineering, The Henry Samueli School of Engineering, University of California, Irvine, CA.

02/02 **NVIDIA Research Fellowship**. Finalist of the fellowship contest. Awarded with the latest graphics hardware product of the manufacturer.

09/99 - 09/00 **Balsells Fellowship**, Department Electrical and Computer Engineering, The Henry Samueli School of Engineering, University of California, Irvine, CA

01/94-07/96 **IC Undergraduate Fellowship**, Technical University of Catalonia (UPC), Robotics and Informatics Institute, Barcelona, Spain

Teaching Experience

07/03 - 07/04 **University of California, Irvine, (USA).** School of Information and Computer Science. Lecturer on the subject of ICS188 Advanced Computer Graphics (20 hours). Course design and lecturing of ICS280 3D Computer Vision (20 hours) and ICS180 Computer Vision and Image Processing (20 hours).

03/00 - 06/00 **University of California, Irvine, (USA).** The Henri Samueli School of Engineering. Teaching Assistant for the course ECE 40 "C++ programming". In charge of Laboratory sessions and course grading.

01/99 - 06/99 **Sun Microsystems, Madrid, (Spain).** Trainning Services Department of Sun Microsystems, Madrid, Spain. Lecturer of Java Programming courses, C programming courses, web design courses and Introduction to Solaris OS.

09/98 - 01/99 **CITeM - La Salle, School of Engineering, Ramon Llull University, Barcelona, (Spain).** Multimedia Engineering Bachelor Program. Lecturer on the subjects Computer animation (10 hours) and Virtual Reality (10 hours).

03/98 **CITeM - La Salle, School of Engineering, Ramon Llull University, Barcelona, (Spain).** Master on Business Technologies (MBT). Lecturer on the subject Multimedia: images, voice, sound and data integration.(8 hours).

09/97 **Universidad Autonoma de Madrid, Madrid, (Spain)**. Java programming language. Lecturer on the subject: GUI and Applet programming. (10 hours).

Domains of Expertise

Extensive experience in animation and computer graphics with special emphasis in the following areas: real-time rendering, game engine programming, GPU shading programming in assembly and Cg, OpenGL including the use of extensions, advanced data structures for multiresolution and level of detail selection, point based rendering approaches, visualization and isosurface extraction methods, image based modeling and rendering and off-line rendering using ray-tracing and photon mapping methods. Knowledge in Silicon Graphics Performer library and programming in Silicon Graphics platforms.

Extensive experience in image processing algorithm design for computer vision applications in areas such as: image enhancement, feature detection, feature tracking, image segmentation, pattern recognition. Furthermore, strong expertise in algorithms for 3D computer vision: camera calibration, stereo matching, volumetric reconstruction, scene reconstruction from images.

Extensive experience in general programming in C/C++, Java and Python. Strong knowledge in advanced data structures and numerical calculus (linear algebra, minimization, root finding and non-linear optimization). Experience on system programming (file access, memory mapped techniques, serial and parallel ports), client-server applications under Windows and UNIX. Extensive knowledge in programming

GUI and graphics applications. Experience in programming networked client-server applications under Windows and UNIX.

Experience in UNIX, Linux and Windows NT/2000/XP system administration. Proficient use of standard productivity tools and word processors. Knowledge of 3D modeling tools.

Peer-reviewed Publications

Journals:

Sainz M., Pajarola R., *Point-Based Rendering Techniques*. Elsevier Journal of Computer and Graphics (C&G), to appear on Special Issue on Point Based Graphics.

Sainz M., Pajarola R., Susin T. and Mercade A., *A Simple Approach for Point-Based Object Capturing and Rendering*. IEEE Journal of Computer Graphics and Applications (CG&A), vol. 24(4):24-33, 2004.

Pajarola R., Sainz M. and Guidotti P., *Confetti: Object-Space Point Blending and Splatting*. IEEE Transactions on Visualization and Computer Graphics (TVCG), to appear.

Pajarola R., Sainz M. and Meng Y., *DMesh: Fast Depth-Image Meshing and Warping*. International Journal of Image and Graphics (IJIG), 4(4):1-29, 2004.

Conferences:

Sainz M., Pajarola R. and Lario R., *Points Reloaded: Point-Based Rendering Revisited*. In Proceedings of the EG Symposium on Point-Based Graphics, pp. 121-128, 2004.

Sainz M., Pajarola R., Susin A., *Photorealistic Image Based Objects from Uncalibrated Images*. In Posters of the IEEE Visualization Conference 2003 (VIS'03).

Sainz M., Susin A. and Bagherzadeh N., *MTMesh: Image Based Mesh Reconstruction and Rendering*. In Proceedings of the IAESTED Conference in Visualization, Imaging and Image Processing (VIIP'03).

Sainz M., Susin A., Cervantes, A. and Bagherzadeh N., *Persepolis: Recovering history with a handheld camera*. In Posters of Eurographics 2003 (EG'03).

Sainz M., Susin A. and Bagherzadeh N., *Camera Calibration of Long Image Sequences with the Presence of Occlusions*. In Proceeding of the International Conference in Image Processing 2003 (ICIP'03), Barcelona.

Sainz M., Bagherzadeh N. and Susin A., *Hardware Accelerated Voxel Carving*. In 1st Ibero-American Symposium in Computer Graphics (SIACG 2002), July 2-5, 2002 Guimarães, Portugal. pp 289-297.

Sainz M., Bagherzadeh N. and Susin A., *Carving 3D Models from Uncalibrated Views*. In 5th IASTED International Conference Computer Graphics and Imaging (CGIM 2002) August 12-14, 2002 Kauai, Hawaii, USA. pp 144-149.

Sainz M., Bagherzadeh N. and Susin A., *Recovering 3D Metric Structure and Motion from Multiple Uncalibrated Cameras*. In IEEE Proc. International Conference on Information Technology: Coding and Computing, pp 268-273, 2002.

Alquézar R., Sanfeliu A. and Sainz M.: *Experimental Assesment of Connectionist Regular Inference from Positve and Negative Examples*. In Proc. of the VII Spanish Symposium on Pattern Recognition and Image Analisys, Bellaterra, 21-25 April (1997).

Sainz M. and Sanfeliu A., *A syntactical approach to learn and identify bidimensional image models*. In Proc. of the VII Spanish Symposium on Pattern Recognition and Image Analisys, Bellaterra, 21- 25 April (1997).

Sanfeliu A. and Sainz M., *Automatic recognition of bidimensional models learned by grammatical inference in outdoor scenes*. In Advances in Structural and Syntactical Pattern Recognition, Proc. of the 6th IAPR International Workshop on Structural and Syntactic Pattern Recognition (SSPR'96), Springer-Verlag, LNCS-1121, pp.160 - 169. ISBN 3-540-61577-6.

Sainz M. and Sanfeliu A., *Learning bidimensional context dependent models using a context sensitive language*. In Proc. of the 13th International Conference on Pattern Recognition, Viena, 25- 29 August 1996.

Sanfeliu A. and Sainz M., *Automatic Model Learning Using Computer Vision*. In Proceedings of the XVI Spanish Worshop in Automatics, San Sebastian, 27-29 Set, (1995).

Sainz M. and Sanfeliu A., *A first approach to learn the model of traffic signs using connectionist and syntactic methods*. In Proc. of the VI Spanish Symposium on Pattern Recognition and Image Analisys, Cordoba, 3-6 April (1995).

Other Publications

Thesis:

Sainz M., 3D Modeling from Images and Video Streams. PhD. Thesis, University of California Irvine, July 2003.

Sainz M., Automatic Learning of Industrial Models Using Computer Vision and its Application to Traffic Sign Recognition. BSc/MSc Thesis, July 1996.

Conferences:

Villa-Uriol M., Sainz M., Kuester F. and Bagherzadeh N., *Automatic creation of three-dimensional avatars*. In Proceedings of SPIE-IS&T Electronic Imaging, SPIE Vol. 5013 (2003), January 21-22, 2003 Santa Clara, California, USA. pp 14-25.

Technical Reports:

Pajarola R. and Sainz M., *Stream-Processing Point Data*. Technical Report UCI-ICS-04-02, Department of Computer Science, University of California Irvine, 2004.

Sankar K., Meenakshisundaram G., Pajarola R. and Sainz M., *Point Light Field for Point Rendering Systems*. Technical Report UCI-ICS-03-28, Department of Computer Science, University of California Irvine, 2003.

Pajarola R., Sainz M. and Guidotti P., *Object-Space Blending and Splatting of Points*. Technical Report UCI-ICS-03-01, The School of Information & Computer Science, University of California Irvine, 2003.

Pajarola R., Sainz M. and Meng Y., *Depth-Mesh Objects: Fast Depth-Image Meshing and Warping*. Technical Report UCI-ICS-03-02, The School of Information & Computer Science, University of California Irvine, 2003.

Pajarola R., Meng Y. and Sainz M., *Fast Depth-Image Meshing and Warping*. Technical Report UCI-ECE-02-02, The Henry Samueli School of Engineering, University of California Irvine, 2002.

Sainz, M.: *Robotical Feeder of Surgical Needles Threading Machine*, Technical Report of the Robotics and Informatics Institute, IRI-DT-9801, February 1997

Sainz M., Thomas F. and Torras C., *Rock Granularity Estimation by Laser Scanning*, Technical Report of the Robotics and Informatics Institute, IRI-DT-9707, November 1997.

Najera J. and Sainz M., *Introduction to Java*, Technical Report of the Robotics and Informatics Institute, IRI-DT-9706 september 1997.

Jimenez P., Najera J. and Sainz M., *Robotical Feeder of Surgical Needles Threading Machine*, Technical Report of the Robotics and Informatics Institute, IRI-DT-9705 September 1997.

Sainz M. and Sanfeliu A., *Automatic learning of industrial models using computer vision and its application to traffic sign recognition*, Technical Report of the Cybernetics Institute, IC-DT-9613, July 1996.

Talks and presentations

Oral presentations:

- Point-based rendering demonstration at the IEEE Visualization Conference 2003 (VIS'03).
- Point-based rendering demonstration at the NVIDIA Booth at the ACM Siggraph 2003 Expo.
- Talk entitled "Advanced Geometry and Texture Blending" at the 2003 NVIDIA-U Conference, July 23-25, 2003.
- Talk entitled "Advanced techniques in computer graphics: Image Based Modeling and Rendering", for the class Psych 114I Interactive Computer Graphics, June 3rd 2003.
- Conference presentation at the 5th IASTED International Conference Computer Graphics and Imaging (CGIM 2002) August 12-14, 2002 Kauai, Hawaii, USA.
- Conference presentation at the IEEE International Conference on Information Technology: Coding and Computing, April 8-10, 2002.
- Talk entitled "Image Based Modeling and Rendering"
- Talk entitled "A first approach to traffic sign learning using connectionist and syntactic methods" at the VI Spanish Symposium on Pattern Recognition and Image Analysis, Córdoba, 3-6 April (1995).

Poster presentations:

- Posters of the IEEE Visualization Conference 2003 (VIS'03).
- Research Review 2003, The Henry Samueli School of Engineering, University of California Irvine, California, USA.
- Research Review 2002, The Henry Samueli School of Engineering, University of California Irvine, California, USA.
- Poster presentation entitled *A syntactical approach to learn and identify bidimensional image models* at the VII Spanish Symposium on Pattern Recognition and Image Analysis, Bellaterra, 21-25 April (1997).
- Poster presentation entitled *Learning bidimensional context dependent models using a context sensitive language* at the 13th International Congress on Pattern Recognition, Vienna, 25-30 August 1996.

Collaborators

Researchers:

- Renato Pajarola, University of California at Irvine.
- Gopi Meenakshisundaram, University of California at Irvine.
- Antonio Susín, Technical University of Catalonia (UPC).
- Mike D'Zmura, University of California, Irvine.

Graduate Advisors:

- Nader Bagherzadeh, University of California at Irvine.
- Antonio Susín, Technical University of Catalonia (UPC).

Advisee Students:

- Albert Mercade, MSc Thesis at the University of California at Irvine.
- Albert Cervantes, Undergraduate projects at the University of California at Irvine.

Professional Activities

- Member of IEEE, IEEE Computer Society, ACM and ACM Siggraph.
- Technical Committee of the IASTED Computer Graphics And Imaging Conference.
- Reviewer of the IEEE Computer Graphics and Applications Journal.
- Reviewer of the IEEE Visualization'04 Conference.
- Reviewer of the ACM Siggraph'04 Conference.
- Reviewer of the Eurographics'04 Conference.

- Reviewer of the Elsevier Journal of the Image and Vision Computing (IMAVIS).

Patents and Copyrights

D'Zmura M., Hagedorn J. and Sainz M. *Jericho Displays. A window graphical user interface for 3D games and virtual environments*. Copyright 2001. University of California, Irvine.