

1 Personal Information

Sara Mulatto (born October 1st 1981)
Home Address: Via Pio La Torre, 49/B, Monteroni d'Ar-
bia (SI), 53014, Italy
Contact:

Mail Address: mulatto@dii.unisi.it
Phone: +39 0577 234850 int.1087



2 Skills

- **Programming Language:** Very good knowledge of the C and C++ language, the standard libraries like LIBC and STL, and the Windows API. Good knowledge of the core Java language and standard libraries like SWING and RMI.
Good experience with the GPU programming, in particular with the Cg and the HLSL shader programming languages.
Good knowledge of the Objective-C programming language for the iPhone applications development.
Basic knowledge of the IA32(x86) Assembly Language.
Basic experience with Visual Basic, basic knowledge of the Matlab language and environment.
Basic knowledge of web related technologies like PHP and Active Server Pages (ASP).
Good knowledge of the eXtensible Markup Language(XML) interchange format and experience with related libraries (tinyxml).
- **Development Environment:** Very good experience using Visual Studio (VS6, VS.NET, VS2003, VS2005) as editors and debugger. Good experience using Borland JBuilder 9/X as editors and debuggers. Good experience using the XCode Development Environment.
- **Graphics Programming:** Very good knowledge of math foundations of Computer Graphics.
Very good knowledge of DirectX 9.0c SDK and in particular of the Direct3D API. Very good knowledge of the PIX for Windows tool, the user interface for collecting and analyzing the GPU data and for the vertex and pixel shader debugging. Good experience in analyzing graphic applications performance with the NVIDIA PerfHUD tool as well as GPU registers debugging. Good knowledge of the NVIDIA FX Composer development environment for shader authoring and its Shader Debugger plug-in for the pixel debugging.
Basic knowledge of OpenGL 1.5.
Basic knowledge and direct experience of the Simple DirectMedia Layer (SDL) 1.1.
- **Haptic Programming:** Three years of experience in haptic programming.
Good knowledge of several SDKs and Toolkits for Haptics (GHOST SDK, OpenHaptics toolkit, DHD API, Virtuose API, Freedom6 SDK, CHAI, H3D API).
- **Physically-based Modeling:** Good knowledge of basic and advanced physics theory.
Very good knowledge of the NVIDIA PhysX SDK for software and hardware simulation of bodies dynamics. Good knowledge of the Open Dynamics Engine (ODE), the high performance C/C++ open source library for the software simulation of the rigid bodies dynamics.

Programming experience with direct implementation of dynamics integration schemes for liquids.

- Modeling: Basic experience with the Autodesk Maya 2008 software. Good rigging skills.
- Artificial Intelligence (AI): Good knowledge of artificial intelligence basic theory.
Good knowledge of the Artificial Neural Networks (ANNs) and the well-known learning algorithms.
- Operating System: Windows - good knowledge and experience programming the Windows API.
Basic experience as Linux user (shell scripts).
- DataBase: Good knowledge and direct experience with SQL queries and tools: MySQL version 5 and 6, IBM DB2, Microsoft Access.

3 Education and Training

Ph.D.: Ph.D. in Robotics and Automation, 1st October 2010.

Ph.D. Thesis: *“Development and implementation of a biomechanics-based 3D avatar of a human hand for haptically-enabled virtual reality”*.

Advisor: Prof. Domenico Prattichizzo.

M.S. degree: M.S. degree in Computer Engineering (Computer and Multimedial Systems) on Academic Year 2005-2006 (25th September 2006) cum laude.

M.S. Thesis: *“Studio ed implementazione di modelli ed algoritmi per il rendering aptico di oggetti deformabili”* (*“Study and implementation of models and algorithms for haptic rendering of deformable objects”*).

Advisor: Prof. Domenico Prattichizzo.

B.S. degree: B.S. degree in Computer Engineering (Computer and Multimedial Systems) on Academic Year 2005-2006 (11st October 2004).

B.S. Thesis: *“Riconoscimento di immagini mediante reti neurali ricorsive”* (*“Images recognition through recursive neural networks”*).

Advisor: Prof. Marco Maggini.

4 Current Position

Research Associate in Engineering of Automation doing research in the field of Physical Simulation of Deformable models and Fluid for Computer Graphics, at the Department of Information Engineering of the University of Siena, under the supervision of prof. Domenico Prattichizzo, since 2010.

5 Academic Research

My research activity is focused on Virtual Reality, including Deformable Objects Rendering and Fluid Simulation, Haptic Rendering and Graphics and it is supervised by prof. Domenico Prattichizzo. Currently my research is addressed towards developing and implementing high-performance skinning and collision detection algorithms (both on software and hardware), for high-realism haptic virtual reality.

6 Teaching

21.01.2008 - 29.03.2008: “*Laboratorio di Matlab*” (“*Matlab Laboratory*”) - 20 hours, University of Siena

21.01.2008 - 29.03.2008: “*Laboratorio di Robotica e Realtà Virtuale*” (“*Robotics and Virtual Reality Laboratory*”) - 20 hours, University of Siena

04.02.2009 - 04.03.2009: “*Laboratorio di Robotica e Realtà Virtuale*” (“*Robotics and Virtual Reality Laboratory*”) - 20 hours, University of Siena

02.02.2010 - 02.03.2010: “*Laboratorio di Robotica e Realtà Virtuale*” (“*Robotics and Virtual Reality Laboratory*”) - 20 hours, University of Siena

7 Attended Conferences and Schools

- “*EuroHaptics Conference 2010*”, Amsterdam - July 2010
- “*SIDRA 2009*”, Siracusa - September 2009
- “*Peach Conference 2008*”, Turin - November 2008
- “*View Conference 2008*”, Turin - November 2008
- “*La Medicina incontra la Realtà Virtuale*”, Rome - October 2008
- “*SIDRA 2008*”, Vicenza - September 2008
- “*EuroHaptics Conference 2008*”, Madrid - June 2008
- “*HyCon 2007*”, Ph.D. School on Hybrid Systems, Siena - July 2007
- “*International Conference on Robotics and Automation - ICRA 2007*”, Rome - April 2007

8 Other

- Qualifying examination passed on the second session of 2006.
- Member of IEEE and IEEE Robotics and Automation Society since 2006.
- Member of the Secretariat of the Italian Chapter of IEEE Robotics and Automation Society, since 2006.
- Member of MIMOS - “*Movimento Italiano per la Modellazione e la Simulazione*” (“*The Italian Movement for Modelling and Simulation*”) since 2008.

Publications

Journal articles and book chapters:

- [1] S. Mulatto, A. Formaglio, M. Malvezzi and D. Prattichizzo. *Animating a synergy-based deformable hand avatar for haptic grasping*. In Proc. of the EuroHaptics Conference 2010, July 2010.
- [2] A. Formaglio, M. Fei, S. Mulatto, M. de Pascale and D. Prattichizzo. *Autocalibrated gravity compensation for 3 DoF impedance haptic devices*. LNCS 5024, 43 - 52. LECTURE NOTES IN COMPUTER SCIENCE. Springer Verlag 2008.

- [3] M. de Pascale, S. Mulatto and D. Prattichizzo. *Bringing Haptics to Second Life for Visually Impaired People*. LNCS 5024, 896 - 905. LECTURE NOTES IN COMPUTER SCIENCE. Springer Verlag 2008.
- [4] D. Prattichizzo, C. Pacchierotti, S. Mulatto, S. Nencini, M. de Pascale, M. Fei and E. Fei *The Role of Robotics in Second Life*. Centre for Policy Modelling 2007.

Conference articles:

- [5] A. Formaglio, S. Mulatto and D. Prattichizzo. *Iterative estimation of the end-effector apparent gravity force for 3DoF impedance haptic devices*. In Proc. of the European Control Conference - ECC 2009, October 2008.
- [6] M. de Pascale, S. Mulatto and D. Prattichizzo. *Bringing Haptics to Second Life*. In Proc. of the Workshop on Haptics in Ambient Systems - HAS 2008, Quebec City. February 2008.
- [7] A. Formaglio, M. Fei, S. Mulatto, M. de Pascale and D. Prattichizzo. *Autocalibrated gravity compensation for 3 DoF impedance haptic devices*. Poster presentation. SIDRA 2008.
- [8] S. Mulatto, A. Formaglio and D. Prattichizzo. *Animating a 3D biomechanics-based hand avatar in haptic interaction*. Poster presentation. SIDRA 2009.

Thesis:

- [9] S. Mulatto. *“Development and implementation of a biomechanics-based 3D avatar of a human hand for haptically-enabled virtual reality”*. Ph.D. Thesis. University of Siena, 2010.
- [10] S. Mulatto. *“Studio ed implementazione di modelli ed algoritmi per il rendering aptico di oggetti deformabili”* (“Study and implementation of models and algorithms for haptic rendering of deformable objects”). M.S. Thesis. University of Siena, 2006.
- [11] S. Mulatto. *“Riconoscimento di immagini mediante reti neurali ricorsive”* (“Images recognition through recursive neural networks”). B.S. Thesis. University of Siena, 2004.

[ITA] Quanto dichiarato nel presente Curriculum Vitae corrisponde a verità ai sensi delle norme in materia di dichiarazioni sostitutive di cui agli artt. 46 e seguenti del D.P.R. 445/2000. Autorizzo al trattamento dei dati personali ai sensi del D.L.g.s. 196/03.