

Stefania Serafin

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EDUCATION

- 1999-present. Ph.D. in Computer Based Music Theory and Acoustics, Stanford University, CCRMA, Music Department. Expected graduation: june 2003.
- 1998. DEA-ATIAM (master-like) degree in Acoustics, Signal Processing and Computer Science applied to Music, IRCAM, Centre G. Pompidou, Paris.
- 1996. Undergraduate Degree in Computer Science, summa cum laude. University Ca' Foscari of Venice, Italy.
- 1987-1993, Conservatory of Venice, Italy. Degrees in violin performance, music theory, piano proficiency, history of music and music analysis.

PROFESSIONAL EXPERIENCE

- Consultant (since january 2003). VRsonic. Design and development of parametric based audio effects.
- Spring 2003. Visiting faculty. Music Department, University of Virginia.
- 2002 (august-september). Visiting scholar at the University of Cambridge, Mechanical engineering department, under the supervision of Prof. Jim Woodhouse.
- 1999. Visiting scholar, CCRMA, Stanford University.
- 1998-1999. Researcher, IRCAM, Analysis-Synthesis team, George Pompidou center, Paris.
- 1998 (march-july). Training period. IRCAM, Analysis-Synthesis team, George Pompidou Center, Paris.
- 1997 (march to september). Researcher and software developer of Audiosculpt. IRCAM, Centre G. Pompidou, Paris.

TEACHING EXPERIENCE

Instructor for the following courses:

- Computer Applications in Music. University of Virginia, spring 2003.
- Physical Interaction Design Workshop I, CCRMA, Stanford University, summer 2002.
- Physical Interaction Design Workshop II, CCRMA, Stanford University, summer 2002.

Teaching assistant for the following courses:

- MUS151: Introduction to Psychoacoustics and Music Cognition, CCRMA, spring 2002.
- MUS250b: Music Controller Design and Development, CCRMA, spring 2002.
- MUS320: Introduction to Digital Audio Signal Processing, CCRMA, fall 2001.
- CCRMA summer workshop: Digital Signal Processing for Audio: Spectral and Physical Models, summer 2001.

- MUS23: Music theory, Stanford University, spring 2001.
- MUS220a: Introduction to Computer Generated Sound, CCRMA, Stanford University, fall 2000.
- CCRMA summer workshop: Linux sound, summer 2000.

DISTINCTIONS

- Post-laurea fellowship of the University of Venice, Italy, 1997-1998. Fellowship for fully funded post-graduate studies in a foreign country for one academic year.
- Scholarship for one year training period, (1998-1999) from the French embassy in Italy.
- Full tuition fellowship from Stanford University (1999-2003).
- Paper reviewer for various journals and conferences.

MEMBERSHIPS

- International Computer Music Association
- Acoustical Society of America
- Audio Engineering Society

PUBLISHED WORK

Chapters in Books

1. S. Serafin. Physical synthesis of bowed string instruments. In *Audio Anecdotes*, Ken Greenebaum editor, AK Peters Ltd, 2003.
2. S. Serafin, R. Dudas. An alternative controller for a virtual bowed string instrument in M. Wanderley and M. Battier (eds): *Trends in Gestural Control of Music- Ircam*.

Articles in international journals

1. M. Burtner, S. Serafin. The ExBow-Metasax. *Compositional Applications of Bowed String Physical Models Using Instrumental Controller Substitution*. *Journal of New Music Research*, 2002 issue 2. Invited paper on a special issue on digital audio effects (DAFX), editor Daniel Arfib.
2. S. Serafin, J.O. Smith III. Impact of string stiffness in virtual bowed strings. *Catgut Acoustical Society Journal*, november 2001.

Articles in Conference Proceedings

1. S. Serafin, J. Smith, J. Woodhouse. Digital waveguide bowed-string model including finite bow width and dynamic rosin model. *Proc. SMAC 2003, Stockholm, August 2003*.
2. C. Burns, S. Serafin, M. Burtner. Musical applications of multichannel generalized digital waveguides. *Proc. SMAC 2003, Stockholm, August 2003*.
3. S. Serafin, F. Avanzini, D. Rocchesso. Bowed string simulation using an elasto-plastic friction model. *Proc. SMAC 2003, Stockholm, August 2003*.
4. S. Serafin, F. Fontana. Modeling Savart 's trapezoidal violin using a digital waveguide mesh. *Proc. SMAC 2003, Stockholm, August 2003*.
5. D. Young, S. Serafin. Playability evaluation of a virtual bowed string instrument. *Proc. NIME 2003, Montreal, may 2003*.

6. S. Serafin, D. Young. Investigation of the playability of virtual bowed strings. Proc CIM XIV, Florence, Italy, may 2003.
7. M. Burtner, S. Serafin. Strictly BowlRoom: the Physically Modeled Singing Bowl as a Transformative Immersive Environment. Proc. ISMA 2002, Mexico City, Mexico, December 2002.
8. D. Topper, M. Burtner, S. Serafin. Spatio-Operational Spectral (S.O.S.) Synthesis. Proc. DAFX 2002, Hamburg, Germany, Sept. 2002.
9. M. Burtner, S. Serafin, D. Topper. Real-Time Spatial Processing and Transformations of a Singing Bowl. Proc. DAFX 2002, Hamburg, Germany, Sept. 2002.
10. J.O. Smith, S. Serafin, J. Abel, D. Berners. Doppler Simulation and the Leslie. Proc. DAFX 2002, Hamburg, Germany, Sept. 2002.
11. F. Avanzini, S. Serafin, D. Rocchesso. Modeling Interactions between Rubbed Dry Surfaces Using an Elasto-Plastic Friction Model. Proc. DAFX 2002, Hamburg, Germany, Sept. 2002.
12. S. Serafin, C. Wilkerson, J.O. Smith III. Modeling bowl resonators using circular waveguide networks. Proc. DAFX 2002, Hamburg, Germany, Sept. 2002.
13. C. Wilkerson, S. Serafin, C. Ng. Physical models and performance mapping of bowl resonators. Proc. ICMC 2002, Gotheborg, Sweden, September 2002.
14. S. Serafin, P. Huang, S. Ystad, C. Chafe, J.O. Smith III. Analysis and Synthesis of Unusual Friction Driven Musical Instruments. Proc. ICMC 2002, Gotheborg, Sweden, September 2002.
15. C. Wilkerson, C. Ng, S. Serafin. The Mutha Rubboard Controller, Interactive heritage. Proc. NIME, Dublin, Ireland, May 2002.
16. S. Serafin, J.O. Smith III, H. Thornburg. A pattern recognition approach to invert a bowed string physical model. Proc. ISMA 2001, Perugia, Italy September 2001.
17. M Burtner, S. Serafin. Extended techniques for physical models using instrumental controller substitution. Proc. ISMA 2001, Perugia, Italy September 2001.
18. S. Serafin, J.O. Smith III, H. Thornburg, F. Mazzella, A. Tellier and G. Thonier. Data driven identification and computer animation of a bowed string. Proc. ICMC 2001, La Havana, Cuba September 2001.
19. M Burtner, S. Serafin. Real time extended physical models for the composer and performer Proc. ICMC 2001, La Havana, Cuba September 2001.
20. J. O. Smith III and S. Serafin. Tutorial lecture on virtual musical instruments (abstract), Journal of the Acoustical Society of America, Program of the 140th Meeting, Newport Beach, CA, Dec. 3-8, vol. 108, no. 5, Pt. 2 of 2, pp. 2487, Nov. 2000, Invited Tutorial (60-page hand-out).
21. S. Serafin, J.O. Smith III. A multirate, finite-width, bow-string interaction model Proc. DAFX 2000, Digital Audio Effects, Verona, Italy december 2000.
22. P. Huang, S. Serafin, J.O. Smith III. Modeling High-Frequency Modes of Complex Resonators Using a Waveguide Mesh Proc. DAFX 2000, Digital Audio Effects, Verona, Italy december 2000.
23. M. Burtner, S. Serafin. Extended Performance Techniques for a Virtual Instrument. Proc. DAFX 2000, Digital Audio Effects, Verona, Italy december 2000.
24. S. O'Modhrain, S. Serafin, C. Chafe, J.O. Smith III. Qualitative and quantitative assessment on the playability of a virtual bowed string instrument. Proc. ICMC 2000: International Computer Music Conference 2000, Berlin, Germany, August 2000.

25. P. Huang, S. Serafin, J.O.Smith III. A 3D Waveguide Mesh Model of High-Frequency Violin Body Resonances. Proc. ICMC 2000: International Computer Music Conference 2000, Berlin, Germany, August 2000.
26. S. Serafin, J.O.Smith III. Influence of the Attack Parameters on the Playability of a Virtual Bowed String Instrument. Proc. ICMC 2000: International Computer Music Conference 2000, Berlin, Germany, August 2000.
27. S. Serafin, J.O. Smith III. Modeling stiffness in virtual bowed-string instruments (abstract) ASA meeting, Atlanta May 2000.
28. S. Serafin, J. O. Smith, III, and J. Woodhouse. An investigation of the impact of torsion waves and friction characteristics on the playability of virtual bowed strings, in IEEE Workshop on Signal Processing to Audio and Acoustics, New Paltz, NY, New York, Oct. 1999, IEEE Press.
29. S. Serafin, C. Vergez, and X. Rodet. Friction and application to real-time physical modeling of a violin. Proc. ICMC 99: International Computer Music Conference 1999, Beijing, China, October 99.
30. S. Serafin, R. Dudas, M. Wanderley, X. Rodet. Gestural control of a real-time physical model of a bowed string instrument. Proc. ICMC 99: International Computer Music Conference 1999, Beijing, China, October 99.

Technical Reports

1. S. Serafin. "A nonlinear oscillator basic physical model of bowed string instruments with application to the violin" DEA-ATIAM, Master's thesis, july 1998, IRCAM Centre George Pompidou, Paris, France.
2. S Serafin. Planarity testing for dynamic graphs, "Laurea" thesis, University of Ca' Foscari, Venice, Italy, November 1996.

INVITED TALKS

1. S. Serafin et al. Panel on Computer Music Research. UVA, Technosonic festival, february 2003.
2. The sound of friction: real-time models, playability and musical applications. University of Limerick, Limerick, January 2003.
3. S. Serafin. Hyperinstruments in HyperSpace. Workshop on Sounding Objects, Mestre, Italy, June 2002.
4. S. Serafin. Tutorial on Physical Modeling Synthesis University of Virginia, May 2002.
5. S. Serafin. Advantages and disadvantages of waveguide physical model synthesis Workshop on Physical models of musical instruments Marseille, France, May 2001.
6. J.O. Smith III, S. Serafin. Virtual musical instruments. Invited tutorial, ASA meeting, Newport Beach december 2000.
7. S. Serafin, J.O. Smith III. Modeling stiffness in virtual bowed-string instruments ASA meeting, Atlanta may 2000 Invited talk at the session: Modeling and Perception of Musical Sound Sources.
8. S. Serafin. Physical modeling, playability and control of a bowed string. IRCAM, june 1999.

Software skills

- Experienced user of UNIX (Irix, Linux), Windows and Macintosh (OS 9 and X) operating systems.
- Proficient in different programming languages such as C, C++, Javascript, Perl.
- Proficient in technical packages such as Matlab.

- Skilled user of many digital audio, MIDI and multimedia programming environments, especially Max/MSP and Pure Data.
- Skilled user of software animation packages such as Maya.

Language skills

- Italian mothertongue
- Fluent in english and french.

REFERENCES

- Prof. Julius O. Smith III, Associate professor, Electrical Engineering and by courtesy Music, Stanford University, Stanford, CA.
- Prof. Chris Chafe, Full professor, CCRMA director, Stanford University, Stanford, CA.
- Prof. Jean-Claude Risset, composer and professor, CNRS Golden Medal, Marseille, France.