Curriculum Vitae

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Education

Ph.D., Electrical Engineering, Spring 1983, Stanford University.
M.S./E.E., Statistical Signal Processing, Spring 1978, Stanford University.
B.S./E.E., Control Communications and Circuits, Spring 1975, Rice University.

Work Experience

Fall 2022 through Summer 2023: Professor Emeritus of Music and by courtesy Electrical Engineering, Stanford University. Half-time teaching and research advising.

Fall 2004 through Summer 2022: Professor of Music and by courtesy Electrical Engineering, Stanford University, based at the Center for Computer Research in Music and Acoustics (CCRMA). Activities include teaching courses in signal processing and music technology, graduate student advising, and research in signal processing techniques applied to music and audio.

Fall 1994 to Fall 2004: Associate Professor of Music and by courtesy Electrical Engineering, Stanford University, at CCRMA. Activities as listed above. In addition, during this period, served as a founding consultant for Staccato Systems, Inc., and Shazam Entertainment, Ltd.

Fall 1989 to Summer 1994 (part to full time): Associate Professor (Research) at CCRMA. Activities included basic research in signal processing techniques applied to music and audio, teaching signal processing courses in support of my research program (Music 320/420/421, EE 265/266), and supervising Ph.D. research in the Computer Music Ph.D. program at CCRMA and in the Electrical Engineering Department.

Summer 1986 to Winter 1993 (part to near full time): Software engineer at NeXT Inc., responsible for signal processing software pertaining to music and audio: Designed and implemented a variable-rate transform coder for real-time compression/decompression of "CD-quality" audio signals on the Motorola DSP56001 signal processing chip. Managed the Sound, Music, and Signal Processing Group. Managed four outside consultants on software development projects. Co-designed the object-oriented NeXT Music Kit with David Jaffe. Designed and implemented DSP56001 software supporting the NeXT Music Kit, including the real-time DSP monitor and unit-generator

modules for sound synthesis and signal processing. Wrote and supported The NeXT DSP Library. Helped support and debug the Sound/DSP Mach driver and the NeXT Sound Library.

Fall 1984 to Summer 1986 (half time): Research Associate, CCRMA, Stanford. Projects included violin modeling, woodwind modeling, new digital filter design methods tailored to audio applications, new reverberation techniques, time-varying sampling-rate conversion, digital filtering software, spectrum analysis software, system identification software, and pitch detection. Duties included teaching a two-year sequence in digital signal processing aimed at graduate students interested in music applications of signal processing and acoustics.

Fall 1982 to Summer 1986 (half time): Systems Control Technology, Palo Alto CA. Projects included time-delay estimation, ARMA modeling and spectrum analysis, underwater acoustic signal processing, HF communications signal processing, and general tool development.

Summer 1980: Electromagnetic Systems Laboratories (ESL), Inc., Sunnyvale CA. Application of linear prediction to FSK demodulation.

Summer 1980: Integrated Systems Inc., Palo Alto CA. Nonlinear estimation of resonant modes in large space structures.

Summer 1980: Computer Audio Research Lab, Center for Music Experiment, University of California, San Diego. Implementation of programs for digital filter design, sampling rate conversion, linear prediction, spectrum analysis, and an on-line documentation facility.

Summer 1979: Acoustics Research Dept., Bell Laboratories, Murray Hill NJ. Application of adaptive filters and variable sampling-rate to the Adaptive Delta Modulation speech coder.

Summer 1978: Total Technology, Inc. Identification of the optical transfer function of phosphor screens in image intensifier systems.

Summer 1978: ESL, Inc. Implementation of software for discriminating among several spoken languages on the basis of phoneme statistics.

Summer 1975 to Fall 1977: ESL, Inc. Digital filter design, AM/FM demodulator design and simulation, research on automatic signal detection and classification, theoretical analysis of system performance, determination of the sensitivity of signal measurements to various types of noise and interference.

Summer 1974: IBM Houston Scientific Center. Software for managing power systems analysis tools.

Honors (reverse chronological order)

- Keynote Speaker, Digital Audio Effects Conference (DAFx-2017), Edinburgh, Scotland, 2017
- Keynote Speaker, Digital Audio Effects Conference (DAFx-2015), Trondheim, Norway, 2015
- Plenary Speaker, IEEE International Workshop on Recent Trends in Signal Processing, Cluj-Napoca, Romania, 2015)
- Keynote Speaker, Linux Audio Conference (LAC-2015, Mainz, Germany)
- Expert Lecture Seminar, 3rd Digital Audio Competition and Seminar, May, 2014, Shanghai
- Guest Reviewer, UCSB Media Arts and Technology End-of-Year Show, June 5–6, 2014
- Invited Presentation: Hot Topics in Musical Acoustics Applied to Real-Time Sound Synthesis, Hot Topics Session, Acoustical Society of America, 166th Meeting, San Francisco, Dec. 4, 2013
- CIRMMT Distinguished Lecture, McGill University, Sep. 2010
- Keynote Speaker, Digital Audio Effects Conference (DAFx-2009, Como Italy)

- Fellow, Audio Engineering Society, 2008
- Heyser Lecture, Audio Engineering Society Conference (AES-2006, San Francisco)
- Invited Masterclass, Audio Engineering Society Conference (AES-2006, San Francisco)
- Keynote Speaker, Digital Audio Effects Conference (DAFx-2006, Montreal, Canada)
- Keynote Speaker, IEEE Workshop on Applications of Signal Processing to Audio & Acoustics (WASPAA-2005)
- Invited presentation: American Association of Physics Teachers, Sacramento, Aug. 2004
- Fellow of the Acoustical Society of America, 2003:
  "For applications of digital signal processing to musical acoustics"
- Invited Speaker, first in the Opening Session, Stockholm Musical Acoustics Conference, 2003
- Invited Tutorial on Virtual Musical Instrument Design, Acoustical Society of America, 2000
- Technical Program Chair, IEEE Audio & Acoustics Signal Processing Workshop, 1997
- IRCAM Scientific Council, since 1996
- Plenary Speaker, Nordic Acoustics Conference, 1996
- Keynote Speaker, Tempo Reale Workshop on Physical Modeling 1996
- Inventor Recognition Award, Stanford Office of Technology and Licensing, 1996
- Keynote Speaker, ICMC-91 (Int. Computer Music Conf.), Montreal
- Invited Speaker, Acoustical Society of America (several meetings)
- Sigma Xi, 1983
- Hertz Graduate Fellowship, Fall 1977 to Fall 1982
- Magna Cum Laude, Rice University, 1975
- Tau Beta Pi, 1974
- Brown Engineering Merit Award, 1974 and 1973
- American Legion Award, 1971
- Moody Foundation Scholarship, 1971

Publications

Below are most of my publications in approximate chronological order. Jump to the end, before my four books, to see the most recent research activity.

Hyperlinks to PDFs, when available, are typically attached only to the `http:` portion of each URL to avoid line-wrapping problems in LaTeX.

[1] J. O. Smith and J. B. Allen, "Variable bandwidth adaptive delta modulation", *Bell System Technical Journal*, vol. 60, no. 5, pp. 719–737, May-June 1981.

[2] J. O. Smith and J. B. Angell, "A constant-gain digital resonator tuned by a single coefficient", *Computer Music Journal*, vol. 6, no. 4, pp. 36–40, 1982.

[3] M. Gutknecht, J. O. Smith, and L. N. Trefethen, "The Caratheodory-Fejer (CF) method for recursive digital filter design", *IEEE Transactions on Acoustics, Speech, Signal Processing*, vol. 31, no. 6, pp. 1417–1426, 1983.

[4] J. O. Smith, "Synthesis of bowed strings", in *Proceedings of the 1982 International Computer Music Conference, Venice*. 1982, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`, Essentially fully contained in [5].

[5] J. O. Smith, *Techniques for Digital Filter Design and System Identification with Application to the Violin*, PhD thesis, Elec. Engineering Dept., Stanford University (CCRMA), June 1983, CCRMA Technical Report STAN-M-14, `https://-ccrma.stanford.edu/STANM/stanms/stanm14/`.

[6] J. O. Smith, "Spectral pre-processing for audio digital filter design", in *Proceedings of the 1983 International Computer Music Conference, Eastman School of Music*. 1983, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`, Essentially fully contained in [5].

[7] J. O. Smith, "An allpass approach to digital phasing and flanging", in *Proceedings of the 1984 International Computer Music Conference, Paris*. 1984, pp. 103–109, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`, CCRMA Technical Report STAN-M-14, `https://ccrma.stanford.edu/STANM/stanms/stanm14/`.

[8] J. O. Smith and P. Gossett, "A flexible sampling-rate conversion method", in *Proc. 1984 Int. Conf. Acoustics, Speech, and Signal Processing (ICASSP-84), San Diego*, New York, Mar. 1984, vol. 2, pp. 19.4.1–19.4.2, IEEE Press, expanded tutorial and associated free software available at the Digital Audio Resampling Home Page: `https://-ccrma.stanford.edu/~jos/resample/`.

[9] J. O. Smith and B. Friedlander, "Estimation of multipath delay", in *Proc. 1984 Int. Conf. Acoustics, Speech, and Signal Processing (ICASSP-84), San Diego*, New York, Mar. 19–21 1984, pp. 15.9.1–15.9.4, IEEE Press.

[10] J. O. Smith and B. Friedlander, "Global convergence of the constant modulus algorithm", *Proceedings of the International Conference on Acoustics, Speech, and Signal Processing, Tampa, Florida*, pp. 30.5.1–30.5.4, 1985.

[11] J. O. Smith and B. Friedlander, "Extensions of the constant modulus algorithm", *Asilomar-84*, 1984.

[12] J. O. Smith and B. Friedlander, "Adaptive multipath delay estimation", *IEEE Transactions on Acoustics, Speech, Signal Processing*, vol. 33, no. 4, pp. 812–822, Aug. 1985.

[13] J. O. Smith and B. Friedlander, "Adaptive interpolated time-delay estimation", *IEEE Transactions on Aerospace and Electronic Systems*, vol. 21, no. 2, pp. 180–199, Mar. 1985.

[14] J. O. Smith, "A new approach to digital reverberation using closed waveguide networks", in *Proceedings of the 1985 International Computer Music Conference, Vancouver*. 1985, pp. 47–53, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`, also available in [19].

[15] C. Chafe, D. Jaffe, K. Kashima, B. Mont-Reynaud, and J. O. Smith, "Techniques for note identification in polyphonic music", in *Proceedings of the 1985 International*

Computer Music Conference, Vancouver. 1985, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`.

[16] J. O. Smith, "Elimination of limit cycles and overflow oscillations in time-varying lattice and ladder digital filters", in *Proceedings of the IEEE Symposium on Circuits and Systems, San Jose*, May 1986, conference version; full version available in [19].

[17] J. O. Smith, "Efficient simulation of the reed-bore and bow-string mechanisms", in *Proceedings of the 1986 International Computer Music Conference, The Hague*. 1986, pp. 275–280, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`, also available in [19].

[18] J. O. Smith, "Waveguide filter tutorial", in *Proceedings of the 1987 International Computer Music Conference, Champaign-Urbana*. 1987, pp. 9–16, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`.

[19] J. O. Smith, "Music applications of digital waveguides", Tech. Rep. STAN-M-39, CCRMA, Music Department, Stanford University, 1987, CCRMA Technical Report STAN-M-39, `https://ccrma.stanford.edu/STANM/stanm39/`.

[20] J. O. Smith and J. S. Abel, "Closed-form least-squares location estimation from range-difference measurements", *IEEE Transactions on Acoustics, Speech, Signal Processing*, vol. 35, no. 12, pp. 1661–1669, Dec. 1987.

[21] J. O. Smith and X. Serra, "PARSHL: A program for the analysis/synthesis of inharmonic sounds based on a sinusoidal representation", in *Proceedings of the 1987 International Computer Music Conference, Champaign-Urbana*. 1987, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`, Also available as Stanford Music Department Technical Report STAN-M-43. Expanded version available on-line at `https://-ccrma.stanford.edu/~jos/parshl/`.

[22] J. O. Smith, D. A. Jaffe, and L. Boynton, "Music system architecture on the NeXT computer", *The Proceedings of the AES 7th International Conference: Audio in Digital Times*, pp. 301–312, May 14–17 1989.

[23] J. O. Smith, "Computer music on the DSP56001", in *Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics, New Paltz, NY*, New York, Oct. 1989, IEEE Press.

[24] C. Roads, Ed., *The Music Machine*, MIT Press, Cambridge, MA, 1989.

[25] J. O. Smith, "Unit-generator implementation on the NeXT DSP chip", in *Proceedings of the 1989 International Computer Music Conference, Ohio*. 1989, pp. 303–306, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`.

[26] J. O. Smith, "Rectangular, Hanning, and Hamming window transforms", Winter 1992, Mathematica notebook for Music 420 (EE 367A), `URL:ftp://ccrma-ftp.stanford.edu/pub/DSP/Tutorials/GenHamming.ma.Z`.

[27] J. O. Smith, "The Kaiser window", Winter 1992, Mathematica notebook for Music 420 (EE 367A), URL:ftp://ccrma-ftp.stanford.edu/pub/DSP/Tutorials/Kaiser.ma.Z.

[28] J. O. Smith, "The window method for digital filter design", Winter 1992, Mathematica notebook for Music 420 (EE 367A), URL:ftp://ccrma-ftp.stanford.edu/pub/DSP/Tutorials/Kaiser.ma.Z.

[29] J. O. Smith, "Efficient yet accurate models for strings and air columns using sparse lumping of distributed losses and dispersion", in *Proceedings of the Colloquium on Physical Modeling*, Grenoble, France, 1990, ACROE, Essentially superceded by [34].

[30] J. O. Smith, "Viewpoints on the history of digital synthesis", in *Proceedings of the 1991 International Computer Music Conference, Montréal*. 1991, pp. 1–10, Computer Music Association, searchable at http://quod.lib.umich.edu/i/icmc/, https://-ccrma.stanford.edu/~jos/kna/.

[31] J. S. Abel and J. O. Smith, "Restoring a clipped signal", in *Proceedings of the International Conference on Acoustics, Speech, and Signal Processing, Toronto*, New York, May 1991, IEEE Press.

[32] J. O. Smith, "Waveguide simulation of non-cylindrical acoustic tubes", in *Proceedings of the 1991 International Computer Music Conference, Montréal*. 1991, pp. 304–307, Computer Music Association, searchable at http://quod.lib.umich.edu/i/icmc/.

[33] J. O. Smith and P. R. Cook, "The second-order digital waveguide oscillator", in *Proceedings of the 1992 International Computer Music Conference, San Jose*. 1992, pp. 150–153, Computer Music Association, searchable at http://quod.lib.umich.edu/i/icmc/, https://-ccrma.stanford.edu/~jos/wgo/.

[34] J. O. Smith, "Physical modeling using digital waveguides", *Computer Music Journal*, vol. 16, no. 4, pp. 74–91, 1992, special issue: Physical Modeling of Musical Instruments, Part I. https://ccrma.stanford.edu/~jos/pmudw/.

[35] J. O. Smith, "Efficient synthesis of stringed musical instruments", in *Proceedings of the 1993 International Computer Music Conference, Tokyo*. 1993, pp. 64–71, Computer Music Association, searchable at http://quod.lib.umich.edu/i/icmc/, incorporated into [328].

[36] J. O. Smith, "Use of commutativity in simplifying acoustic simulations", in *Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics, New Paltz, NY*, New York, Oct. 1993, IEEE Press.

[37] J. O. Smith and D. Rocchesso, "Connections between feedback delay networks and waveguide networks for digital reverberation", in *Proceedings of the 1994 International Computer Music Conference, Århus*. 1995, pp. 376–377, Computer Music Association, searchable at http://quod.lib.umich.edu/i/icmc/.

[38] J. O. Smith and S. A. Van Duyne, "Commuted piano synthesis", in *Proceedings of the 1995 International Computer Music Conference, Banff*. 1995, pp. 319–326, Computer Music Association, searchable at http://quod.lib.umich.edu/i/icmc/, https://-ccrma.stanford.edu/~jos/pdf/svd95.pdf.

[39] D. P. Berners and J. O. Smith, "On the use of Schrodinger's equation in the analytic determination of horn reflectance", in *Proceedings of the 1994 International Computer Music Conference, Århus*. 1994, pp. 419–422, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`.

[40] D. P. Berners and J. O. Smith, "Super-spherical wave simulation in flaring horns", in *Proceedings of the 1995 International Computer Music Conference, Banff*. 1995, pp. 112–113, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`.

[41] B. Friedlander and J. O. Smith, "Analysis and performance evaluation of an adaptive notch filter", *IEEE Transactions on Information Theory*, vol. 30, no. 2, pp. 283–295, Mar. 1984.

[42] J. W. Gordon and J. O. Smith, "A sine generation algorithm for VLSI applications", in *Proceedings of the 1985 International Computer Music Conference, Vancouver*. 1985, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`, `https://-ccrma.stanford.edu/~jos/pdf/GordonAndSmith86.pdf`.

[43] S. Hirschman, P. R. Cook, and J. O. Smith, "Digital waveguide modelling of reed woodwinds: An interactive development environment on the NeXT computer", in *Proceedings of the 1991 International Computer Music Conference, Montréal*. 1991, pp. 300–303, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`, available in "CCRMA Papers on Physical Modeling from the 1991 International Computer Music Conference," Department of Music Technical Report STAN-M-73, Stanford University, October 1991.

[44] D. A. Jaffe and J. O. Smith, "Extensions of the Karplus-Strong plucked string algorithm", *Computer Music Journal*, vol. 7, no. 2, pp. 56–69, 1983, Reprinted in [24, pp. 481–494].

[45] D. A. Jaffe and J. O. Smith, "Real time sound processing and synthesis on multiple DSPs using the Music Kit and the Ariel QuintProcessor", in *Proceedings of the 1993 International Computer Music Conference, Tokyo*. 1993, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`.

[46] D. A. Jaffe and J. O. Smith, "Performance expression in commuted waveguide synthesis of bowed strings", in *Proceedings of the 1995 International Computer Music Conference, Banff*. 1995, pp. 343–346, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`.

[47] D. A. Jaffe, J. O. Smith, and N. Porcaro, "The Music Kit on a PC", in *Proceedings of the First Brazilian Symposium on Computer Music, XIV Congress of the Brazillian Society of Computation, Caxambu*, Canela, Brazil, Aug. 1994, pp. 63–69, Informática UFRGS.

[48] N. Porcaro, P. Scandalis, J. O. Smith, D. A. Jaffe, and T. Stilson, "SynthBuilder—a graphical real-time synthesis, processing and performance system", in *Proceedings of the 1995 International Computer Music Conference, Banff*. 1995, pp. 61–62, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`.

[49] D. Rocchesso and J. O. Smith, "Circulant feedback delay networks for sound synthesis and processing", in *Proceedings of the 1994 International Computer Music Conference, Århus*. 1995, pp. 378–381, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`.

[50] X. Serra and J. O. Smith, "Spectral modeling synthesis: A sound analysis/synthesis system based on a deterministic plus stochastic decomposition", *Computer Music Journal*, vol. 14, no. 4, pp. 12–24, 1990, Software and recent papers URL: `//www.iua.upf.es/~xserra/`.

[51] X. Serra and J. O. Smith, "Sound-sheet examples for a sound analysis/synthesis system based on a deterministic plus stochastic decomposition", *Computer Music Journal*, vol. 15, no. 1, pp. 86–87, Spring 1991.

[52] S. A. Van Duyne and J. O. Smith, "Implementation of a variable pick-up point on a waveguide string model with FM/AM applications", in *Proceedings of the 1992 International Computer Music Conference, San Jose*. 1992, pp. 154–157, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`.

[53] S. A. Van Duyne and J. O. Smith, "Physical modeling with the 2-D digital waveguide mesh", in *Proceedings of the 1993 International Computer Music Conference, Tokyo*. 1993, pp. 40–47, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`, `https://ccrma.stanford.edu/~jos/pdf/mesh.pdf`.

[54] S. A. Van Duyne and J. O. Smith, "The 2-D digital waveguide mesh", in *Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics, New Paltz, NY*, New York, Oct. 1993, IEEE Press.

[55] S. A. Van Duyne and J. O. Smith, "A simplified approach to modeling dispersion caused by stiffness in strings and plates", in *Proceedings of the 1994 International Computer Music Conference, Århus*. 1994, pp. 407–410, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`.

[56] S. A. Van Duyne, J. R. Pierce, and J. O. Smith, "Traveling-wave implementation of a lossless mode-coupling filter and the wave digital hammer", in *Proceedings of the 1994 International Computer Music Conference, Århus*. 1994, pp. 411–418, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`, Also presented at the conference of the Acoustical Society of America, Nov., 1994.

[57] S. A. Van Duyne and J. O. Smith, "Developments for the commuted piano", in *Proceedings of the 1995 International Computer Music Conference, Banff*. 1995, pp. 335–343, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`, `https://-ccrma.stanford.edu/~jos/pdf/vds95.pdf`.

[58] J. O. Smith, "Discrete-time modeling of acoustic systems", *CCRMA Associates Conference*, May 1995, Monograph in progress.

[59] J. O. Smith, "Digital waveguide models for sound synthesis based on musical acoustics", in *Proceedings of the 15th International Conference on Acoustics (ICA-95), Trondheim, Norway, April 4–9*, June 1995.

[60] J. O. Smith, "Music synthesis techniques based on musical acoustics research", in *Proceedings of the International Meeting on Physical Modeling in Music, Physical Modeling of Ancient Instruments, and Applications of Physical Modeling in Psychoacoustics, Thessaloniki, Greece*, July 10–12 1995.

[61] J. O. Smith, "Future developments in physical modeling", in *Proceedings of the International Meeting on Physical Modeling in Music, Physical Modeling of Ancient Instruments, and Applications of Physical Modeling in Psychoacoustics, Thessaloniki, Greece*, July 10–12 1995.

[62] J. O. Smith and S. A. Van Duyne, "Recent results in piano synthesis via physical modeling", in *Proceedings of the International Symposium on Musical Acoustics (ISMA-95), Dourdan, France*, France, July 1995, pp. 503–509, Société Français d'Acoustique.

[63] J. O. Smith and J. S. Abel, "The Bark bilinear transform", in *Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics, New Paltz, NY*, New York, Oct. 1995, IEEE Press, Session 8, paper 6, 4 pages. `https://-ccrma.stanford.edu/~jos/gz/bbtmh.tgz`.

[64] W. Putnam, D. Rocchesso, and J. O. Smith, "A numerical investigation of the invertibility of room transfer functions", in *Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics, New Paltz, NY*, New York, Oct. 1995, IEEE Press.

[65] S. A. Van Duyne and J. O. Smith, "The tetrahedral waveguide mesh: Multiply-free computation of wave propagation in free space", in *Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics, New Paltz, NY*, New York, Oct. 1995, pp. 9a.6.1–4, IEEE Press.

[66] J. O. Smith and S. A. V. Duyne, "Overview of the commuted piano synthesis technique", in *Proceedings of the IEEE Workshop on Applications of Signal Processing to Audio and Acoustics, New Paltz, NY*, New York, Oct. 1995, pp. 9a.4.1–4, IEEE Press.

[67] J. O. Smith, "Physical modeling synthesis update", *Computer Music Journal*, vol. 20, no. 2, pp. 44–56, 1996, `https://ccrma.stanford.edu/~jos/pmupd/`.

[68] T. Stilson and J. O. Smith, "Alias-free synthesis of classic analog waveforms", in *Proceedings of the 1996 International Computer Music Conference, Hong Kong*. 1996, pp. 332–335, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`, `https://-ccrma.stanford.edu/~stilti/`.

[69] A. Igoudin and J. O. Smith, Eds., *CCRMA Report, May 1996*, Stanford University Department of Music Technical Report STAN-M-98, May 1996.

[70] T. Stilson and J. O. Smith, "Analyzing the Moog VCF with considerations for digital implementation", in *Proceedings of the 1996 International Computer Music Conference, Hong Kong*. 1996, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`, `https://ccrma.stanford.edu/~stilti/`.

[71] M. Karjalainen and J. O. Smith, "Body modeling techniques for string instrument synthesis", in *Proceedings of the 1996 International Computer Music Conference, Hong Kong*. Aug. 1996, pp. 232–239, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`.

[72] S. A. Van Duyne and J. O. Smith, "The 3D tetrahedral digital waveguide mesh with musical applications", in *Proceedings of the 1996 International Computer Music Conference, Hong Kong*. 1996, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`.

[73] N. Porcaro, P. Scandalis, D. Jaffe, and J. O. Smith, "Using SynthBuilder for the creation of physical models", in *Proceedings of the 1996 International Computer Music Conference, Hong Kong*. 1996, Computer Music Association, searchable at `http://quod.lib.umich.edu/i/icmc/`.

[74] J. O. Smith, "Discrete-time modeling of acoustic systems with applications to sound synthesis of musical instruments", in *Proceedings of the Nordic Acoustical Meeting, Helsinki*, 1996, pp. 21–32, (Plenary paper.).

[75] J. O. Smith, "Recent results in discrete-time models of musical instruments", in *Proceedings of the Tempo Reale Workshop on Physical Model Synthesis of Sound, Florence*, June 1996, pp. 1–6, (Keynote paper).

[76] J. O. Smith, "Principles of digital waveguide models of musical instruments", in *Applications of Digital Signal Processing to Audio and Acoustics*, M. Kahrs and K. Brandenburg, Eds., pp. 417–466. Kluwer Academic Publishers, Boston/Dordrecht/London, 1998.

[77] D. Rocchesso and J. O. Smith, "Circulant and elliptic feedback delay networks for artificial reverberation", *IEEE Transactions on Speech and Audio Processing*, vol. 5, no. 1, pp. 51–63, Jan. 1997, preprint `https://ccrma.stanford.edu/~jos/cfdn/`.

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[79] J. O. Smith, "Acoustic modeling using digital waveguides", in *Musical Signal Processing*, C. Roads, S. T. Pope, A. Piccialli, and G. De Poli, Eds., pp. 221–263. Swets and Zietlinger, Netherlands, 1997.

[80] G. Scavone and J. O. Smith, "Digital waveguide modeling of woodwind toneholes", *132nd meeting of the Acoustical Society of America, Honolulu*, Dec. 1996.

[81] N. Porcaro, W. Putnam, P. Scandalis, D. Jaffe, J. O. Smith, T. Stilson, and S. V. Duyne, "SynthBuilder and Frankenstein, tools for the creation of musical physical models", in *International Conference on Auditory Display, Palo Alto*, G. Kramer, Ed. 1996, Santa Fe Institute and Xerox Parc, `http://www.santafe.edu/~icad/`.

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There are additional publications and course materials in my Google Scholar profile:
`https://scholar.google.com/citations?user=Dx1EblMAAAAJ`
This is the most complete list, but due to its automation I need to manually correct it from time to time.