Durand R. Begault, Ph.D.
Curriculum Vitae

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EXPERT TESTIMONY 1995 – 2023

2023 **Vedder v. Fortin** (Santa Barbara County, Superior Court of California) Case No. 1469084
Tovar v. City of San Jose, et al. (US DC, Northern District of California) (deposition) 5:21-cv-02497-EJD
Bumstead Living Trust et al. v. Moss (Probate Court, Harris County, Texas) (deposition) Cause No. 484,673
Eight KHZ v. Meta Platforms et al. (US DC, Western District of Texas, Waco Div.) (deposition) 6:22-cv-575-ADA-DTG
Pacheco v. City of Stockton et al. (US DC, Eastern District of California) (deposition) 20-cv-01404-TLN-KJN

2022 **Ethiopian Airlines Flight ET 302 Crash** (US DC, Northern District of Illinois, Eastern Division) (deposition) 1:19-cv-02170
Torres v. Los Angeles Unified School District, et al. (Los Angeles County, Superior Court of California) (deposition) BC701873
McGauh et al. v. Naudet et al. (Circuit Court, Jackson County, Missouri) (deposition) 2016-CV14902
Clark v. City of Sacramento et al. (US DC, Central District of California) (deposition) 2:19-cv-00171-JAM-EFB

2021 **Novak v. City of Madera et al.** (US DC, Eastern District of California) (deposition) 1:20-CV00301-DAD-SKO
Clear One Inc. v. Shure Acquisition Holdings (US Patent Trial & Appeal Board) (third deposition) IPR 2020-00079
Korzekwa v. Encore (San Francisco County, Superior Court of California) (deposition) CGC-18-570071

2020 **QC Manufacturing v. Solatube International (**JAMS Arbitration, Los Angeles, California) 1210037272
Gross v. Towfiq (Orange County, Superior Court of California) 30-2020-01165114-CU-NP-CJC
Caldwell v. City and County of San Francisco (US DC, Northern District of California) (deposition) 12-cv-1892-DMR
Lefiti v. Allied Universal Security Services (San Francisco County, Superior Court of California) (deposition) CGC-17-561236
Cascade investments NV v. Republic of Turkey (ICSID, The World Bank, Washington, D.C.) 19-20107 (ES) (SCM)
Clear One Inc. v. Shure Acquisition Holdings (US Patent Trial & Appeal Board) (second deposition) IPR 2019-00683
Moro v. Lezama (Santa Barbara County, Superior Court of California)
Doe, Borrayo v. Napa Valley Unified School District (Napa County, Superior Court of California) (deposition) 16CV000234

2019 **Watson v. BNSF Railway** (Pawnee County, District Court, State of Oklahoma) CJ-2015-00028
Clear One Inc. v. Shure Acquisition Holdings (US Patent Trial & Appeal Board) (deposition) IPR 2019-00683
Economus v. City & County of San Francisco (US DC, Northern District of California) (deposition) ND 4:18-CV-01071

2018 **Irwin v. County of Sacramento** (Sacramento County, Superior Court of California) (deposition) 34-2017-00210093
Ernesto Flores v. County of San Bernardino (US DC, Central District of California) (deposition) 5:2015-cv-0220
Sahar v. Shefayee (Contra Costa County, Superior Court of California) MSC20-00706
People v. J. Grant and C. Warren (Santa Clara County, Superior Court of California) C1759030
Maharrey v. County of Kern (US DC, Eastern District of California) (deposition) BCV-15-101291

2017 **Alvarez, et al. v. Fresno Community Regional Medical Center** (deposition) 13-CEC-G03906
McGowan; Blanco v. County of Kern et al. (US DC, Eastern District of California) (deposition) ED 1:15-cv-01365-KJM-SKO
People v. Jereh Lubrin et al. (Santa Clara County, Superior Court of California) C1519377
Taheri v. Four Seasons Hotels Ltd. et al. (Second Circuit Court, Maui, Hawaii) HI 1:15-cv-00024

2016 **People v. Joseph Nunn** (Placer County, Superior Court of California) 62-125182
Krapivkin v. L. B. Property Management (Los Angeles County, Superior Court of California) LC096466
ABS Entertainment v. CBS Corporation (deposition) CD 2:15-CV-06257-PA-AGR
Dolan v. Troy (deposition) (Marin County, Superior Court of California) CIV 1205771
Marriage Preston v. Preston (Weld County, District Court, Colorado)

2015 **Olivero v. Yellow Cab** (San Francisco County, Superior Court of California) CGC 14 537850
People v. Foreman (Marin County, Superior Court of California) SC188751A
Capitol Oil v. Tanin, et al. (Sacramento County, Superior Court of California) (deposition)

2014 **Frary v. County of Marin** (US DC, Northern District of California) (deposition) C12 3928 MEJ
Sterling v. City of Antioch (US DC, Northern District of California) (deposition) 13-cv-00812-NC
Johnson v. Bay Area Rapid Transit (US DC, Northern District of California) ND C09-00901 EMC
Hale v. Atlantic Recording Corporation (deposition)
People v. Bernstine (Kelly-Frye Hearing re "Shot Spotter") Contra Costa County, Superior Court of California) CIVMSN13-0781
Burkinshaw v. Box Elder County (US DC, D. Utah) (deposition) 1:13CV00079-CW

2013 **Rosenblatt v. Town of Hillsborough** (deposition) ND C12-5210 LB
McConville v. Aspen Transportation et al. (deposition) RIC1101758
Duenez v. City of Manteca (deposition) 2:11-cv-01820-LKK-KJN
Connor v. City of Porterville (Tulare County, Superior Court of California) 10-239413

EXPERT TESTIMONY 1995 – 2023 (CONT.)

2012 **Crown v. Levin** (Court of Queen's Bench, Superior Trial Court, Province of Alberta)
Hayley v. C. W. Brower, Inc. (Stanislaus County, Superior Court of California)
Faidi v. Faidi (Marin County, Superior Court of California) FL1100264
Hernandez v. City of Napa et al. (US DC, Northern District of California) C–09–02782 EDL

2011 **State of New Mexico v. Shirley** (Fifth Judicial Court, County of Lea, New Mexico) 142 N.M. 765
Enriquez v. City of Fresno (US DC, Eastern District of California) 1:10-CV-00581-AWI-DLB
Singh v. City of Gilroy (deposition) 5:09-cv-00740-EJD
Mehdavi v. City of Fremont (deposition)
People v. Kopack (San Luis Obispo County, Superior Court of California)

2010 **Nokia v. Apple Computer, Inc.** (US International Trade Commission, Washington, DC) 1:09-cv-00791
Richardson v. City of Antioch, et al. (US DC, Northern District of California) (deposition) 3:08-cv-03470
Jones v. County of Del Norte et al. (US DC, Northern District of California) (deposition) 08-cv-03222 CW
Walston v. Davis (Los Angeles County, Superior Court of California) (deposition)

2009 **State of Texas v. Lewis** (Brazoria County DC, Texas) 01-10-00762-CR
Libananco Holdings Co. Ltd. v. The Republic of Turkey (ICSID, The World Bank, Washington, D.C.)
Rago et al. v. Federal Signal Corporation (deposition)
People v. Mark Corella (Alameda County, Superior Court of California)

2008 **Green v. Fire Insurance Exchange** Alameda County, Superior Court of California) (deposition) HG04151663
Taylor v. Medimpact (deposition)
Bose Corporation v. Phitek, et al. (deposition) (International Trade Commission, Washington, D.C.)
Euparadorn v. Dunning (deposition)
Johnson v. Lumenis Corporation (deposition)
Del Barba v. AMR (deposition)

2007 **People v. McClish** (Santa Cruz County, Superior Court of California)
Schnapf v. Shaugnessy (Marin County, Superior Court of California)

2006 **Williams v. Patton** (deposition)
People v. Hessabi (Solano County, Superior Court of California)
Screen Actors Guild v. NBC Studios, Inc. (arbitration)
Bay Ship and Yacht vs. McKinley, et al. (deposition)
Bowoto v. Chevron (deposition) (US DC, Northern District of California)

2005 **State of Nevada v. Harkins** (Judicial Court, Washoe County, State of Nevada-)

2004 **People v. Davis** (Marin County, Superior Court of California)
Zarzuela v. Zarzuela (Orange County, Superior Court of California)
Cavette v. Johnson (Los Angeles County, Superior Court of California)

2003 **Pacific American Securities v. McGee** (arbitration)
People v. Gantz (San Francisco County, Superior Court of California)

2002 **Clanton v. Carr** (Humboldt County, Superior Court of California) (deposition)

1998 **Skallerud v. City of Pinole** (US DC, Northern District of California)
Aureal Corporation v. Creative Technology Ltd. (deposition)

1997 **Willis v. County of El Dorado** (deposition)

1995 **Focal Point v. Advanced Gravis** (arbitration)

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DEGREES

University of California, San Diego, Ph.D. 1987 Computer Audio (Music -Theoretical Studies). Emphases in psychoacoustics, digital signal processing, computer audio, acoustic engineering, speech sciences, music theory. Dissertation: *Control of Auditory Distance.* Research and post-doc work conducted at the Computer Audio Research Laboratory, U. C. San Diego.

Mills College, Oakland, California, M.F.A. 1981 Electronic Music & Recording Media

University of California, Santa Cruz, B.A. ***cum laude*** 1979 Music & Heuristic Models

Continuing education in audio forensics with Fausto Poza (Poza Consulting Services); video forensic training at Ocean Systems.

CONSULTING POSITIONS

1996-current Director, **Audio Forensic Center**, **Charles M. Salter Associates**, San Francisco, CA

Expert consultant in the areas of acoustics; video and audio evidence recordings; audio patent infringement analysis; acoustic measurement; speech intelligibility and warning signal audibility; human factors and psychoacoustics; musicology and copyright infringement; voice comparison; and recorded gunshot analysis. Authentication, speech enhancement, signal identification and analysis of audio-video recordings in legal cases. Consultation in over 800 audio-video and acoustic forensic cases since 1987. Expert testimony over eighty times in court or depositions, in U.S. Federal and State courts including the United States International Trade Commission (USITC), and courts in Canada and International arbitration panels (World Bank-ICSID).

RESEARCH POSITIONS

1988-current **NASA Ames Research Center** Research Scientist, Human Systems Integration Division

Research scientist specializing in psychoacoustics, human factors, multimodal systems, and communications engineering research, applied to aerospace safety, virtual reality, and speech communications. Activities have included: Design of experiments concerned with spatial hearing, speech intelligibility, human performance, acoustic analysis and simulation, cognitive load, and multimodal interaction. Development and patenting of advanced technologies for communications and warning systems, virtual acoustic technologies. Participant in writing NASA standards (NASA-STD-3001), recommendations and publications. Cross-laboratory team organization and cooperative agreements with industry and academia (Bang & Olufsen, McGill University, Alegent Health, U.C. San Diego). Collaboration and support for NASA programs include the Human Research Program for human factors of space habitats; the Airspace Operations and Safety Program (aeronautics directorate); JSC's Crew and Thermal Systems Division (EVA communications); Dept. of Homeland Security DNDO (Domestic Nuclear Detection Office); and aviation noise response for the RVLT program (Revolutionary Vertical Lift Technology). Member, Auditory Health and Performance Focus Group, Multilateral Medical Operations Panel (ISS). Expertise in acoustical engineering, acoustic measurement and instrumentation, simulation, human factors and subjective evaluation. Four US patents for audio technologies; over one hundred publications (conference papers, journal papers, book chapters, and books); >4900 citations per Google Scholar.

ACADEMIC POSITIONS

2004-2018	**McGill University**, Adjunct Professor, Sound Recording program, Schulich School of Music (lecturer in room acoustics; audio-haptic interaction).
1997-2016	**Ph.D. committee member**, Helsinki University of Technology; U.S. Naval Postgraduate School, Monterey; University of Paris VI; McGill University; University of Melbourne; Northwestern University; Chalmers University of Technology, Goteburg, Sweden; University of Nice.
1996	**San Francisco State University**, Conceptual Design Program: Lecturer, Multimedia Technology.
1995-7	**University of California Santa Cruz Extension**, Department of Science and Technology. Visiting Lecturer, Audio Technology.
1987-8	**San Diego State University,** Lecturer, Computer Music.

HONORS AND AWARDS

Audio Engineering Society **Fellowship Award** for contributions to spatial hearing, 2002
NASA **Ames Honor Award**, contractor category, 1999
Ten NASA **Certificates of Recognition** for Inventive Contributions, 1992-2005
Three NASA **Garner Space Act Awards** for US patents, 1994, 2002
Three NASA **Director's Discretionary Funding** awards 1992, 1997, 2001
NASA Ames Research Center **Nielsen Award** for best basic research proposal, 1992
National Research Council **Post-Doctoral Fellowship**, Ames Research Center, 1988-90
Post-Doctoral Fellowship, U.C.S.D. Computer Audio Research Laboratory, 1987
University of California **Regent's Fellowship**, U.C.S.D., 1981-2

REVIEW BOARDS AND STANDARDS COMMITTEES

Member, Human Subjects Institutional Review Board, NASA Ames Research Center (2012-2014).
Member, Acoustical Society of America Subcommittee on Forensic Acoustics (2011-2014).
Chair, Technical Committee on Audio Forensics, Audio Eng. Soc. (2006-2010).
Associate Technical Editor and Vice-Chair, Publications Committee, Journal of the Audio Engineering Society (2009-2012).
Co-papers chair, semi-annual International Conference on Audio Forensics, sponsored by the Audio Engineering Society (2008-2017).
Chair, Technical Committee on Perception and Subjective Evaluation of Audio Signals (1999-2006), Audio Eng. Soc.; member, Standards Committee, Forensic Audio.
Vice-Chairman (2006, 2010-2015), Technical Committee on Human Factors, Audio Eng. Soc..
Reviewer (guest), Journal of the Human Factors Society, Journal of the Acoustical Society of America, Journal of Experimental Psychology, Int. Journal of Audiology.

PROFESSIONAL SOCIETIES

Acoustical Society of America; Audio Engineering Society; Human Factors and Ergonomics Society; Institute of Noise Control Engineering; International Association for Identification; Society of Forensic Engineers and Scientists; American Musicological Society.

PATENTS

Begault, D. R. (1992). "Head related transfer function pseudo-stereophony". U.S. patent 5,173,944.
Begault, D. R. (1995) "Multi-channel spatialization system for audio signals". U.S. patent 5,438,623.
Begault, D. R. (2008) "Auditory alert systems with enhanced detectability", U.S. Patent 7,346,172.
Begault, D. R., Anderson, M. R., McClain, B. M. and Miller, J. D. "Reconfigurable Auditory-visual Display (2008) U.S. Patent 7,378,963.

BOOK PUBLICATIONS, CHAPTERS IN EDITED BOOKS

Begault, D. R. (1994). *3-D Sound for Virtual Reality and Multimedia.* Cambridge, MA: Academic Press Professional.

Begault, D. R. (1996). *The Sonic CD-ROM for Desktop Audio Production. An Electronic Guide to Producing Computer Audio for Multimedia*. [CD-ROM]. Chestnut Hill, MA: Academic Press Professional.

Ellis, S. R., Begault, D. R., & Wenzel, E. M. (1997). Virtual Environments as Human-Computer Interfaces. In M. Helander (Ed.), Handbook of Human-Computer Interaction. Amsterdam: Elsiver Science Publishers B.V.

Begault, D. R. (1998). Fundamentals of Acoustics. Psychoacoustics and Hearing. Acoustical Measurements. In C. M. Salter (Ed.), *Acoustics. Architecture, Engineering, The Environment.* New York: McGraw-Hill.

Begault, D. R. (1999). 3-D Sound and Auralization. In J. Sendra (Ed.) *Computational* Architectural Acoustics. Southampton, UK: Computational Mechanics Publications.

Begault, D. R. (Ed.). (2004). *Spatial Sound Techniques*. *Part I: Virtual and Binaural Audio Technologies.* New York: Audio Engineering Society.

Begault, D. R., Godfroy, M., and Wenzel, E. M. (2017). Perception of spatial sound. In Roginska, A. and Geluso, P. (ed.s), *Immersive Sound: The Art And Science of Binaural and Multi-Channel Audio*. Burlington, MA: Taylor and Francis.

Begault, D. R. and Sandor, A. (2017). Visual-Aural Alert Design. in Sgobba, T., Kanki, B. G., Clervoy, J. and Sandal, G. (ed.s), *Space Safety and Human Performance.* Amsterdam, NL: Elsevier.

RECORDING CREDITS

As engineer: Diamanda Galas, *Litanies of Satan* (1982).
As engineer: Anthony Braxton Quartet, *Twelve Compositions- Live at Yoshi's* (1993).
As engineer: Julius Hemphill, Abdul Wadud, *Oakland Duets* (1993).
As consultant: Roger Reynolds, *Process and Passion* (2004).

JOURNAL AND CONFERENCE PUBLICATIONS, WORKSHOPS

Begault, D. R. (1986). Spatial Manipulation and Computers. *Ex Tempore 4*(1), 56-88.

Begault, D. R. (1987). *Control of Auditory Distance*. Unpublished Ph.D. dissertation, Music Department, U. C. San Diego. Available via University Microfilms International, Ann Arbor, MI.

Begault, D. R. (1990). The Composition of Auditory Space: Recent Developments. *Leonardo 23* (1), pp. 45-52.

Begault, D. R. & Wenzel, E. M. (1990). Technical Aspects of a Demonstration Tape for Three-Dimensional Auditory Displays. (Technical Memorandum 102286). NASA Ames Research Center.

Begault, D. R. (1991). Preferred sound intensity increase for sensation of half distance. *Perceptual and Motor Skills*, *72*, 1019-1029.

Begault, D. R. (1991). Challenges to the successful implementation of 3-D sound. *Journal of the Audio Engineering Society*, *39* (11), 864-870.

Begault, D. R. (1992). Perceptual effects of synthetic reverberation on three-dimensional audio systems. *Audio Engineering Society 91st Convention* (paper 3212).

Begault, D. R. & Wenzel, E. M. (1991). Headphone Localization of Speech Stimuli. In *Proceedings of the Human Factors Society 35th Convention*, pp. 82-86.

Begault, D. R. (1992). Perceptual effects of synthetic reverberation on three-dimensional audio systems. *Journal of the Audio Engineering Society*, *40*(11), 895-904.

Begault, D. R. & Wenzel, E. M. (1992). Techniques and applications for binaural sound manipulation in human-machine interfaces. *International Journal of Aviation Psychology 2*(1), 1-22.

Begault, D. R. (1992). The Virtual Reality of 3-D Sound. In L. Jacobson (Eds.), *Cyberarts: Exploring Art and Technology* (pp. 79-87). San Francisco: Miller-Freeman Publications.

Begault, D. R. (1992). Binaural Auralization and Perceptual Veridicality. *Audio Engineering Society 93rd Convention*, *San Francisco, CA* (paper 3421).

Begault, D. R. (1992). Perceptual similarity of measured and synthetic HRTF filtered speech stimuli. *Journal of the Acoustical Society of America*, *92*, 2334.

Begault, D. R. & Wenzel, E. M. (1993). Headphone Localization of Speech. *Human Factors*, *35*, 361-376.

Begault, D. R. (1993). An introduction to 3-D sound for virtual reality. In S. K. Helsel (Ed.), *VR Becomes A Business: Virtual Reality '92 Proceedings.* (pp. 4-15). Westport, CT: Meckler.

Begault, D. R. (1993). Call sign intelligibility improvement using a spatial auditory display: applications to KSC speech communications. *Proceedings of the Space Operations, Applications and Research (SOAR) Conference*, 363-70. NASA Johnson Space Center.

Begault, D. R. (1993). Call sign intelligibility improvement using a spatial auditory display (Technical Memorandum No. 104014). NASA Ames Research Center.

Begault, D. R., & Erbe, T. R. (1993). Multi-channel spatial auditory display for speech communications. *Audio Engineering Society 95th Convention*, Preprint No. 3707 .

Begault, D. R. (1993, October). The Evolution of 3-D Sound. *Mix, 17*, 42-46.

Begault, D. R. (1993). A head-up auditory display for TCAS advisories. *Human Factors*, *35*, 707-717.

Begault, D. R., & Pittman, M. T. (1994). 3-D Audio Versus Head Down TCAS Displays. (Contractor Report No. 177636). Moffett Field, CA: NASA Ames Research Center.

Begault, D. R., & Erbe, T. (1994). Multichannel spatial auditory display for speech communications. *Journal of the Audio Engineering Society*, *42*, 819-826.

Begault, D. R. (1995). Virtual acoustic displays for teleconferencing: Intelligibility advantage for "telephone grade" audio. *Audio Engineering Society 98th Convention, San Francisco* (paper 4008).

Begault, D. R. (1995). Head-up auditory display research at NASA Ames Research Center. *Proceedings of the 39th Annual Human Factors and Ergonomics Society Meeting, San Diego, CA.*

Begault, D. R. (1996). Audible and inaudible early reflections: thresholds for auralization system design. *Audio Engineering Society 100th Convention, Copenhagen, DK* (paper 4244).

Begault, D. R., & Pittman, M. T. (1996). Three-Dimensional Audio Versus Head-Down Traffic Alert and Collision Avoidance System Displays. *International Journal of Aviation Psychology*, *6*(1), 79-93.

Begault, D. R. (1996). Virtual acoustics, aeronautics and communications. Audio *Engineering Society 101st Convention, Los Angeles* (paper 4352).

Begault, D. R., Wenzel, E. M., Shrum, R., & Miller, J. (1996). A virtual audio guidance and alert system for commercial aircraft operations. *Proceedings of the International Community on Auditory Display (ICAD 1996), Palo Alto, CA.*

Foyle, D. C., Andre, A. D., McCann, R. S., Wenzel, E. M., Begault, D. R., & Battiste, V. (1996). Taxiway Navigation and Situation Awareness (T-NASA) system: Problem, design philosophy, and description of an integrated display suite for low-visibility airport surface operations. *Proceedings of the SAE/AIAA World Aviation Congress*, paper 965551.

McCann, R. S., Andre, A. D., Begault, D. R., Foyle, D. C., & Wenzel, E. M. (1997). Enhancing ground taxi performance under low visibility: are electronic moving maps enough? *Proceedings of the Human Factors Society 41st Annual Meeting, Albuquerque, NM*, pp. 37-41.

Begault, D. R. (1997). Evaluation of psychoacoustical parameters of 3-D sound. *Workshop on three-dimensional sound spatialization and its applications* [Invited presentation]*, Institut de Recherche et Coordination Acoustique/Musique (IRCAM), Paris, FR*.

Begault, D. R. (1997). Virtual acoustics: evaluation of psychoacoustic parameters of early reflection synthesis for improved rendering and data reduction. [Invited paper] *Proceedings of IWHIT'97, Third International Workshop on Human Interface Technology, University of Aizu, Aizu-Wakamatsu, Japan, March 12-14, 1997.*

Begault, D. R., Wenzel, E. M., & Lathrop, W. B. (1997). Augmented TCAS advisories using a 3-D audio guidance system. *Proceedings of the Ninth International Symposium on Aviation Psychology.*

Begault, D. R., Wenzel, E. M., Tran, L. L., & Anderson, M. R. (1998). Survey of Commercial Airline Pilot's Hearing Loss. *Perceptual and Motor Skills*, v. 86, p. 258.

Begault, D. R., & Abel, J. S. (1998). Studying room acoustics using a monopole-dipole microphone array. *Proceedings of the 16th International Congress on Acoustics and 135th Meeting of the Acoustical Society of America, Seattle, 369-370*.

Begault, D. R., Wenzel, E. M., Tran, L. L., & Anderson, M. R. (1998). Octave-band thresholds for Modeled Reverberant Fields. *Audio Engineering Society 104th Convention, Amsterdam, NL* (paper 4662).

Begault, D. R. (1998). Virtual acoustics, aeronautics and communications. *Journal of the Audio Engineering Society*, *46*, 520-530.

Begault, D. R. (1998). An introduction to Auralization and Psychoacoustics. *Conference Acoustique Virtuelle '98 - le son 3d et ses applications, Pôle Universitaire Leonard de Vinci, Paris.*

Begault, D. R., Ellis, S. R., & Wenzel, E. M. (1998). Headphone and head-mounted visual displays for virtual environments. *Proceedings of the Audio Engineering Society 15th International Conference (Audio, Acoustics, and Small Spaces), Snekkersten, DK*, pp. 213-217.

Abel, J. S., & Begault, D. R. (1998). Methods for room acoustic analysis and synthesis using a monopole-dipole microphone array. *Proceedings of the 1998 International Congress on Noise Control Engineering (InterNoise 98), Christchurch, NZ* (paper 123).

Begault, D. R. (1999). Auditory and non-auditory factors that potentially influence virtual acoustic imagery. *Proceedings of the Audio Engineering Society 16th International Conference on Spatial Sound Reproduction, Rovaniemi, FIN.* [invited paper]

Begault, D. R. (1999). Challenges facing 3-D audio display design for multimedia. *Proceedings of the 137th meeting of the Acoustical Society of America, 2nd Convention of the European Acoustics Association (Forum Accusticum 99) and the 25th German DAGA Conference, Berlin.*

Begault, D. R. (1999). Virtual acoustic displays for teleconferencing: intelligibility advantage for "telephone-grade" audio. *Journal of the Audio Engineering Society*, *47,* 824-828.

Begault, D. R. (2000). Direct comparison of the impact of head tracking, reverberation, and individualized head-related transfer functions on the spatial perception of a virtual speech source. *Audio Engineering Society 108th convention, Paris* (paper 5134).

Begault, D. R. (2000). Improved HRTF-Based Pseudo-stereophony. *NASA Tech Briefs*. pp. 40-43.

Begault, D. R. (2001). Compositional spatial sound manipulation: historical overview and analyses. *Journal of the Acoustical Society of America (abstracts)*, *109,* 2460. [invited paper]

Begault, D. R. and McClain, B. U. (2001). Early reflection thresholds for virtual acoustic sound field simulation. *Proceedings of the 17th International Congress on Acoustics, Rome, 2-7 September* [invited paper].

Begault, D. R., McClain, B. U., and Anderson, M.R. (2001). Early reflection thresholds for virtual sound sources. *Proceedings of the 2001 International Workshop on Spatial Media (IWSM '01), Aizu-Wakamatsu, Japan. October 25-26, 2001* [invited paper]

Begault, D. R., Wenzel, E.M. and Anderson, M. R. (2001). Direct comparison of the impact of head tracking, reverberation and individualized head-related transfer functions on the spatial perception of a virtual speech source. *Journal of the Audio Engineering Society*, *49,* 904-916.

Krukowski, A. E., Begault, D. R., Wenzel, E. M., and Stone, L. S. (2001). Human oculomotor responses to virtual auditory motion. *Society for Neuroscience 31st Annual Meeting*, *San Diego, CA* (poster).

Krukowski, A. E., Begault, D. R., Wenzel, E. M., and Stone, L. S. (2002). Human smooth pursuit eye movement responses to visual, auditory, and imagined target motion. *The Society for the Neural Control of Movement Twelfth Annual Meeting, Naples, Florida,* poster 404.15.

Jost, A. and Begault, D. R. (2002). Observed effects of HRTF measurement signal level. *Proceedings of the Audio Engineering Society 21st International Conference. Architectural acoustics and sound reinforcement, St. Petersburg, RU.*

Begault, D. R. (2002). Challenges and solutions for realistic room simulation. *Journal of the Acoustical Society of America (abstracts)*, *111,* 2440. [invited paper]

Begault, D. R. (2002, October). Binaural Effects and Spatial Hearing. In A. Kohlrausch & D. Begault (Co-chairs.), *What Audio Engineers Should Know About Human Sound Perception. Workshop, Audio Engineering Society 113th Convention, Los Angeles, CA*

Begault, D. R. (2002). Making audible alarms more noticeable in noisy environments. *NASA Tech Briefs* **26**(9).

Begault, D. R., Anderson, M. R., & McClain, B. U. (2003). Spatially-modulated auditory alerts. *Proceedings of the 2003 International Conference on Auditory Display, Boston, MA. July 6-9 2003.*

Adelstein, B. D., Begault, D. R., Anderson, M. R., & Wenzel, E. M. (2003). Sensitivity to Haptic-Audio Asynchrony. *Fifth International Conference on Multimodal Interfaces November 5-7, Vancouver, B.C.*

Krukowski, A. E., Begault, D. R., et al. (2003 submitted). Pursuing the invisible: Human oculomotor response to auditory motion. *Nature*.

Begault, D. R. (2003). Intelligibility in auditory displays. *Proceedings of Reproduced sound 19, Institute of Acoustics, Oxford, UK*.

Begault, D. R. (2003). Overview of electronic reverberation systems. In D. R. Begault (Chair), *Electronic reverberation systems*. *Workshop, Audio Engineering Society 114th Convention, Amsterdam, NL.*

Begault, D. R. (2003). Measurement and auralization of 'moving' late reverberation. *Proceedings of the Third International Workshop on Spatial Media (IWSM 2003), Aizu, Japan.*

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