John Gordon Casali, Ph.D., CPE

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- Web Page-Short Vita & Laboratory: https://sites.google.com/a/vt.edu/john-g-casali-grado-chaired-professor/
- 2016 NIOSH Safe-in-Sound Award for Innovation: See http://www.safeinsound.us/winners.html
- A 33-year overview of the Auditory Systems Lab at Virginia Tech: http://www.safeinsound.us/swf/2016/VATECHIST/index.html

Brief Vita

Dr. Casali is the John Grado Professor of Industrial and Systems Engineering (ISE) and Director of the Auditory Systems Laboratory at Virginia Tech in Blacksburg, VA. He is a Board-Certified Professional Ergonomist (CPE registration # 222). Since 2015, he also is Founder and Chief Technology Officer of *Hearing, Ergonomics & Acoustics Resources (HEAR) LLC,* a Virginia company that conducts product design/testing, intellectual property assistance, research contracts, and litigation support, including human factors expert witness services.

Dr. Casali attended public schools in Princeton, WV and received a B.S. in Psychology (1977) and M.S. (1979) and Ph.D. (1982) degrees in Industrial Engineering (IE) with concentrations in Human Factors Engineering at Virginia Tech. During his graduate work, he received two IE scholarships and was a Virginia Tech Cunningham Dissertation Year Fellow. He joined the faculty in 1982 and was promoted to Associate Professor with tenure in 1986, to Full Professor in 1991, to the Grado Professorship in 1996, and was Department Head from 1995-2002. He is an international authority on ergonomics, human factors engineering, situation awareness, hearing protection, and auditory displays. Dr. Casali is a *Fellow* of the Human Factors and Ergonomics Society since 1994, and a *Fellow* of the Institute of Industrial Engineers (IIE) since 2001. Dr. Casali recently received two major national awards, the *Lauer Safety Award* for outstanding accomplishments in safety-related research/practice from the Human Factors and Ergonomics Society (HFES) in October, 2017, and the *Safe-in-Sound Award for Innovation* in hearing conservation from the National Institute for Occupational Safety and Health (NIOSH) in February, 2016, as well as the *Outreach Excellence Award* in September, 2020 from Virginia Tech College of Engineering for his community and professional work outside the university.

As a consultant, Dr. Casali has served over 80 U.S. and foreign companies and U.S. government organizations in over 150 projects concerning industrial and product safety, acoustics and hearing protection, ergonomics, warning signal design, operator displays and zoning/ordinances. He is active as a legal consultant, having served in expert witness or other litigation support capacities in over 50 cases involving civil tort law, patent litigation, criminal law and public hearings. These cases have encompassed industrial safety, product and premises liability, systems ergonomics, hearing-critical arbitration, hearing protection, acoustic alarms, situation awareness, signal detection, community and occupational noise, and intellectual property. He also developed and teaches a university course and outreach seminar on expert witnessing and litigation for engineers.

Dr. Casali has research interests in human factors, ergonomics, product/premises safety and acoustics/hearing, and he has conducted experiments spanning the human factors of displays, operator workload and attention, hearing protection devices, auditory situation awareness in military and industrial applications, active noise cancellation, headset design, ear anthropometry, aircraft cockpit communications, truck safety, driver-vehicle interaction and vehicular displays, warning signal design, backup alarm design, aural nondetectability (stealth) of military devices, and operator communications in noise and under workload. He has developed both a truck and an automobile simulator, as well as two systems to train humans to detect, recognize and localize stimuli in their environment. His research contracts at Virginia Tech and HEAR LLC, spanning over 100 separate projects, have been funded to a total of over $7 million by a variety of government and military agencies (e.g., Office of Naval Research, U.S. Navy Submarine Medical Research Lab, FHWA, NIOSH-CDC, U.S. Army Aeromedical Research Lab, U.S. Army Human Engineering Lab, Naval Training Systems Center, U.S. Bureau of Mines, DoD Hearing Center of Excellence) as well as industrial corporations (e.g., 3M, Etymotic Research, Alcoa, General Motors, Toyota, Battelle, United Parcel Service, Triton Systems, Carilion Health Care Systems, Peltor AB and Bilsom AB of Sweden, Bose Corp., Shure Inc., Sound Innovations, Inc., AEARO Corp., Custom Protect Ear, Inc.). In total, he has been responsible for procuring over $14.8 million of funds to Virginia Tech. A large portion of his research work on human hearing, hearing protection and auditory situation awareness has been supported by the National Institute of Occupational Safety and Health and the Office of Naval Research.

Dr. Casali founded and developed the Auditory Systems Laboratory, which is unique among U.S. academic institutions in that it is equipped to conduct experimentation on and testing of hearing protectors as per ANSI Standards S3.19-1974, S12.42-2010, and S12.6-2016, as well as several ISO and military standards. This facility houses both anechoic and reverberant acoustical chambers as well as a variety of acoustical and audiometric instrumentation. In 2009, he also developed the Auditory Field Test Range for outdoor experiments involving detection, identification, localization and other situation awareness tasks. Many of the publications emanating from the laboratory and field test range concern human operational performance, auditory situation awareness and communications, hearing protection effects and military hearing scenarios, and vehicular-related alarms; Dr. Casali is considered to be a leading expert in these research areas. He has also developed an ultra-low noise floor facility to perform human aural nondetectability acoustical testing for military devices per MIL-STD-1474E. Furthermore, he has tested hundreds of hearing protection devices and headsets for noise attenuation performance and speech intelligibility, and has testified to the U.S. EPA regarding testing protocols and product labeling.

In February, 2006, Dr. Casali was elected *President* of the *National Hearing Conservation Association,* an international organization whose mission is to prevent hearing loss due to noise in all sectors of society. He was awarded the *Outstanding Hearing Conservationist* award by this Association in February, 2009. In May of 2005, he received the *Institute of Industrial Engineers (IIE) Alexander Holtzman Distinguished Educator Award,* the premier industrial engineering educator award, and in 1999, he also received from IIE the *David Baker Award,* the premier industrial engineering research award. Dr. Casali was also selected for the following honorary societies: Sigma Xi, Alpha Pi Mu, Psi Chi, and Phi Kappa Phi. He is an Editorial Board member of *Human Factors* and serves as reviewer for several other journals. He has served on several ANSI and ISO Standards committees on hearing protection and human engineering. He previously served on the Scientific Advisory Boards for CPE of Canada and for Personics Holding Company.

He also has received from the Human Factors and Ergonomics Society (HFES) the *Paul M. Fitts Award* (September, 1997) for outstanding contributions to the education and training of human factors specialists, and the *Jack A. Kraft Award* (September, 1991) for his efforts to extend or diversify the application of human factors. He also received the *American Psychological Association Briggs Award* for the Outstanding Dissertation in Engineering Psychology for 1982. From the National Hearing Conservation Association (NHCA) he received the *Outstanding Lecture Award* based on audience ratings for his papers at both the 2008 and 1991 NHCA Conferences, and the 1994 *Media Award* for television and newspaper interviews he gave on the problems of noise exposure. He has been interviewed, and the Virginia Tech Auditory Systems Lab featured, on three national Cable News Network (CNN) TV shows: World News Tonight, Headline News, and Science and Technology Week. In May, 1998, Virginia Tech awarded him the *Engineering Award for Excellence in Research* while he was serving as Department Head of Industrial and Systems Engineering. In September, 2002, Virginia Tech awarded him its highest research award, the *Alumni Award for Research Excellence.* From the College of Engineering at Virginia Tech, in May, 2006 he received the *Outreach Excellence Award*, in May, 2011 he received the *Dean's Teaching Excellence Award,* and in May of both 1998 and 2013, he received the *Dean's Research Excellence Award.* In 2014, his former Ph.D. student, Lt. Col. Kristy Casto and he received the *Haley Writing Award* from the Army Aviation Medical Association, for the best helicopter-related aerospace medicine publication in any media (journal, book, video) for year 2013.

As Department Head (1995-2002) at Virginia Tech, Dr. Casali recruited 15 faculty and played a significant role in procuring over $7.2 million in donations and scholarships/fellowships, including a major endowment which resulted in the permanent naming of the ISE department for the benefactor (Mr. John Grado). Under his leadership, in 2000 the ISE department was named as one of three *Exemplary Departments* at Virginia Tech for accomplishments toward diversity and multiculturalism. In 2002, the ISE department also rose to become the 7th-ranked department nationally in *U.S. News and World Report* rankings for undergraduate programs and 8th-ranked for graduate programs, and it remains one of the top-ranked programs at Virginia Tech.

Dr. Casali has been a versatile teacher, receiving several commendations for his classroom performance. Under Casali's chairmanship, 31 M.S. and 25 Ph.D. students (10 from the U.S. military) have completed degrees. He credits much of the research accomplishments of the Auditory Systems Laboratory to the work of these students. Dr. Casali is holder or co-holder of 8 awarded patents: 4 U.S. Patents (#8,550,206 B2, #8,554,350 B2, #5,333,622 and #5,131,411) for innovations in hearing protection and communications devices, U.S. patent (#5,651,422) for a detachable power drive/steer attachment for a folding wheelchair, U.S. Patent (#7,822,219) for a method of displacing cartilage in the ear canal to position hearing aids and earplugs, U.S. Patent (#9,763,003) and European Patent (#EP2663470A0) for a method of maintaining constant signal-to-noise ratio in vehicle to enhance situation awareness. He has authored or co-authored noise ordinance legislation adopted by small cities and participated in numerous public hearings on zoning and community noise annoyance issues.

In the human factors engineering and acoustics literature, Dr. Casali has authored over 170 publications, including over 120 refereed papers. He has also given over 130 technical presentations, workshops, and seminars, including plenary or invited speeches at conferences in South America, Canada, NATO-AGARD in Belgium, Germany, and Denmark, as well as in the U.S.

A few sample publications are listed below. A full curriculum vita which lists all publications, patents, consulting and expert witness activities, research contracts, and other accomplishments is available upon request.

Casali, J. G and Tufts, J. Auditory situation awareness and speech communications in noise. Invited book chapter in Meinke, D. et al. (Eds.), The Noise Manual, 6th Ed., Fairfax, VA: American Industrial Hygiene Association, Chapter 17, in press.

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Lee, K. and Casali, J. G. Development of an auditory situation awareness test battery for advanced hearing protectors and TCAPS: Detection subtest of DRILCOM (Detection-Recognition/Identification-Localization-Communication). International Journal of Audiology, 2017, 56, Suppl 1, 22-33.

Clasing, J. E. and Casali, J. G. Warfighter auditory situation awareness: Effects of augmented hearing protection/enhancement devices and TCAPS for military ground combat applications. International Journal of Audiology, 2014, 52, Suppl 2, 43-52.

Casto, K. L. and Casali, J. G. Effects of headset, flight workload, hearing ability, and communications message quality on pilot performance. Human Factors, 2013, 55(3), 486-498.

Alali, K. A. and Casali, J. G. Auditory backup alarms: Distance-at-first detection via in-situ experimentation on alarm design and hearing protection effects. Work: A Journal of Prevention, Assessment, and Rehabilitation, 2012, 41, 3599-3607

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Belz, S. M., Robinson, G. S., and Casali, J. G. Temporal separation and self-rating of alertness as indicators of driver fatigue in commercial motor vehicle operators. Human Factors, 2004, 46(1), 154-169.

Robinson, G. S. and Casali, J. G. Audibility of reverse alarms under hearing protectors for normal and hearing-impaired listeners. Ergonomics, 1995, 38(11), 2281-2299.

Casali, J. G. and Park, M. Y. Attenuation performance of four hearing protectors under dynamic movement and different user fitting conditions. Human Factors, 1990, 32(1), 9-25.

Casali, J. G. and Wierwille, W. W. Mental workload assessment. In Gael, S. (Ed.) The Job Analysis Handbook for Business, Industry, and Government I, New York: John Wiley, 1988, 697-714.

Casali, J. G. and Gaylin, K. B. Selected graph design variables in four interpretation tasks: A microcomputer-based pilot study. Journal of Behavior and Information Technology, 1988, 7(1), 31-49.

Casali, J. G. and Frank, L. H. Perceptual distortion and its consequences in vehicular simulation: Basic theory and incidence of simulator sickness. Transportation Research Record, 1986, 1059, 57-65.