

## **MICHAEL ERMANN, AIA**

Professor, Virginia Tech School of Architecture + Design  
mermann@vt.edu

### **EDUCATION**

Master of Architecture, 2000  
University of Florida

Bachelor of Science in Mathematics, Cum Laude, 1996  
Tulane University

### **PROFESSIONAL EXPERIENCE**

Virginia Tech School of Architecture + Design, 2001-present  
[Full Professor with Tenure](#)  
Undergraduate Architecture Program Chair, 2007-2011

Artec Consultants (now Arup), New York City  
Architectural Acoustics and Theater Planning Consultant, 2000-2001

Siebein Associates, Gainesville, Florida  
Architectural Acoustics Consultant, 1997-1999

### **RECENT AWARDS AND RECOGNITION**

#### **Teaching Awards**

Virginia Tech School of Architecture + Design Award for Faculty Development, 2022

AIA Virginia [Award](#) for Distinguished Achievement, 2019  
Lifetime achievement award "For contributions to the profession as an educator and researcher"

Virginia Tech School of Architecture + Design Lecture/Seminar Teaching Excellence Award, 2018

Virginia Tech Teacher of the Week (university-wide), 2015

National Council of Acoustical Consultants selected the architectural acoustics focus at Virginia Tech as one of eight acoustics programs nationally for their recurring student travel [award](#). This is not something I applied for; it was awarded without application based on the reputation of the architectural acoustics program I created, 2014-present.

Virginia Tech School of Architecture + Design Lecture or Seminar Teaching Excellence Award, 2005 (inaugural award)

Perfect student evaluations in six different courses

Received the highest possible overall instructor score from every student in a class in six different course types: advanced acoustics, building systems, design studio, architectural structures, undergraduate and graduate thesis, and a graduate seminar for non-majors I created titled, "Design at every scale: a walking tour," 2001-present

## Research Awards

Virginia Tech School of Architecture + Design Faculty Research Excellence Award, 2015  
Conferred for the [book](#), *Architectural Acoustics Illustrated*, Wiley 2015

American Institute of Architects (AIA) Virginia [Prize](#) for Design Research and Scholarship, First Place. Awarded for the book, *Architectural Acoustics Illustrated*. “The jurors recognized that your submission covered an interesting and important subject, noting that the content has great depth,” 2014

American Institute of Architects (AIA) Virginia [Prize](#) for Design Research and Scholarship, Honorable Mention (inaugural prize) “Five sensitivities of a coupled volume concert hall.” Jury chaired by Cesar Pelli, 2008.

Paper selected for “best-of” [book](#) publication, 2009

Gibbs, B, Goodchild, J, Hopkins, C, and Oldham, D, ed. *Collected Papers in Building Acoustics: Room Acoustics and Environmental Noise*. Multi-Science Press, 2010. ISBN 978-1-907132-14-8.

Ermann, M, “Coupled Volumes: Aperture size and the double-sloped decay of concert halls,” was selected for inclusion into the book “because of its quality, citation history and contribution to the science and practice of Building Acoustics.”

## Design Awards

Virginia Tech School of Architecture + Design Award for Creative Achievement, 2021

Architizer A+ Design [Award](#). One of five finalists in the Architecture + Glass category and one of five finalists, and the winner of the Popular Choice Award in the Architecture + Climate Change category for Bubble Wrap House, primary designer, 2020.

The International awards program selected the Blacksburg project in those categories alongside such firms as Lake Flato and UN Studio. Finalists in other categories included Morphosis, MVRDV, Zaha Hadid, Studio Gang, Toshiko Mori, James Corner, Lewis Tsurumaki Lewis, Steven Holl, MAD, and Brian McKay-Lyons. The house addition was also featured Dwell Magazine Online [here](#).

American Institute of Architects (AIA) Blue Ridge Honor Award for [Bubble Wrap House](#), primary designer, 2018

Architectural acoustics instruction for student design-build [amphitheater](#)

The project was voted “Building of the Year 2012” by American-architects.com; received the inaugural Association of Collegiate Schools of Architecture (ACSA) Design-Build Award; was chronicled in the documentary “Reality Check” by filmmaker Leon Gerskovic; and was featured in Archdaily.com, Architects Magazine, and Metropolis Magazine. My role in this project was *not* as lead faculty, but only as acoustical consultant and acoustics coach to students, 2012.

American Institute of Architects (AIA), Blue Ridge Merit Award for the Diliberti “C5” Residence, secondary designer, 2007

## Grants Awarded

### Blast noise grant

Army Corps of Engineers CESU program, PI, 2016  
\$119,000. My share of the faculty effort: 100%

### Cafeteria noise grant

Cornell Center for Behavioral Economics in Child Nutrition Programs, 2013  
\$20,000. My share of the faculty effort: 25%  
Awarded, in collaboration with the nutrition department, to measure the impact of cafeteria noise on school lunch nutrition.

### School noise grant

Architectural Research Centers Consortium (ARCC) Incentive Fund, PI, 2012  
\$2,400, My share of the faculty effort: 100%  
[Awarded](#) to disseminate our findings linking school HVAC system noise to elementary school student achievement

### Architectural acoustics animation grant

Schultz Grant/Newman Fund/Acoustical Society of America (ASA), PI, 2012  
\$2,400, My share of the faculty effort: 100%  
Awarded to create an [animation](#) illustrating principles of room acoustics.

### Acoustics of multifamily housing publication grant

Acoustical Society of America, PI, 2008  
\$3,500, My share of the faculty effort: 100%  
The unanimous first choice among the three judges.

### Science education grant

Institute for Society, Culture, and Environment (ISCE), Co-PI, 2008  
\$16,000, My share of the faculty effort: 25%  
Awarded to support [Fields Everywhere](#).

### Science education grant

Educational Enhancement Collaboration, Co-PI, 2008  
\$5,000, My share of the faculty effort: 25%  
Awarded to develop [curricula](#) for middle schools teaching [sound](#) fields.

## SELECTED RESEARCH PUBLICATIONS

### Books

Ermann, M, *Architectural Acoustics Illustrated*, Wiley, 2015

With more than 200 illustrations and more than 1 hour of online video animations, the text translates the science of acoustics into the graphical language of architecture. Book review [here](#), pg 32.

*The World's Best Architecture*, Phaidon Press, 2020

The Bubble Wrap house I designed was featured

### Peer-reviewed journal papers

Ermann, M, "[Double sloped decay: subjective listening test to determine perceptibility and preference](#)," *Building Acoustics*. Vol 14 (2), Jun 2007, pp 91-107.

Ermann, M, Kidner, M, and Mennitt, D, "[Mapping the sound field of a 400 seat theater](#)," *Building Acoustics*. Vol 13 (3), Sep 2006, pp 199-210.

Warren, P, Katti, M, Ermann, M, and Brazel, A, "[Urban bioacoustics: it's not just noise](#)," *Animal Behaviour*. Vol 71, 10 Feb 2006, pp 491-502.

Ermann, M, "[Coupled volumes: secondary room reverberance and the double-sloped decay of concert halls](#)," *Building Acoustics*. Vol 12 (3), Sep 2005, pp 165-174.

Ermann, M, "[Coupled volumes: aperture size and the double-sloped decay of concert halls](#)," *Building Acoustics*. Vol 12 (1), Mar 2005, pp 1-13. (selected for "best-of" book)

Ermann, M, Johnson, M, "[Exposure and materiality of the secondary room and its impact on the impulse response of coupled volumes](#)," *Journal of Sound and Vibration*. Vol 284 (3-5), 13 Dec 2004, pp 915-931.

Siebein, G W, Gold, M, Siebein, G, Ermann, M, "[Ten ways to provide a high quality acoustical environment in schools](#)," *American Speech-Language-Hearing Association's Journal of Language Speech and Hearing Services in the Schools*. Vol 13, Oct 2000, pp 376-384.

### SELECTED PROFESSIONAL AND RESEARCH ACTIVITY

Aided 20,000+ Architecture emerging professionals toward architecture licensure with Amber Book online animated [video course](#) and hardcopy [workbook](#) I created. The Amber Book is generally [recognized](#) as the premiere course for ARE prep, 4,000+ positive online reviews, 2015-present.

Taught intensive 3-day seminars for 1,000+ emerging professionals studying for the ARE exam for AIA New York (11 times), AIA New Orleans (4 times), AIA Northern Virginia (4 times), AIA Miami (3 times), AIA Dallas (3 times), AIA Raleigh (2 times), AIA Houston, AIA New Mexico, AIA Alaska, AIA San Francisco, and AIA Washington DC. Also taught at firms in New York (3 times), Los Angeles (2 times), Baltimore, Las Vegas, and St Louis (click [here](#) for all anonymous course evaluations), 2012-2016.

Partnered with AIA National (2 times), AIA Dallas, AIA Miami, AIA San Francisco, and AIA Connecticut to provide AIA members access to Amber Book online course, 2015-present

7 Million YouTube views, 35,000 YouTube subscribers

Author, building science [video series](#) (3% of the Amber Book course) on the topics of architectural acoustics, electricity, air conditioning, plumbing, masonry, metal, wood, electric lighting, roofs, and building foundations, 2011-present

Registered Architect

Licensure, 2017-present. First person in the nation (tied) to pass all six ARE 5.0 divisions

Created the [Olive Book](#), an animated video course to teach math, grammar, reading comprehension and science to high school students in the way that *an architect* would teach them (spatially and authentically), 2018-present

Developed bubble wrap translucent insulating sandwich panel insulating material, 2007-2017

Virginia Tech architectural acoustics research lab

Equipment capable of taking acoustic measurements in rooms, simulating acoustic environments, and analyzing the acoustic character of computer-modeled rooms. The acoustics program I've created attracts students specifically interested in studying Architectural Acoustics to Virginia Tech. 2001-2019

Professional association involvement

Co-chair Acoustical Society of America Student Design Competition, 2015

Member, Acoustical Society of America Technical Committee on Architectural Acoustics and the Technical Committee on Noise, 2002-2018

Member, Institute for Noise Control Engineering, 2012

Faculty representative, Association of Collegiate Schools of Architecture, 2007-2010

Member, board of directors, North Carolina Chapter of the Acoustical Society of America (NC-ASA), 2004-2006. Organizer, NC-ASA meeting in Blacksburg, 2004

LEED Accredited Professional, 2004-present

Undergraduate Architecture Program Co-Chairman, School of Architecture + Design

Wrote faculty reviews, scheduled courses and assigned faculty, advised 250 students, identified and hired visiting-, and tenure-track, faculty, administered and evaluated office support staff, organized lecture series and design competitions, fundraised, assigned scholarships, and maintained budget, 2007 to 2011.

Other scholarship

20+ invited papers to national-level peer reviewed conferences

30+ other papers presented at peer-reviewed conferences

20+ article and manuscript reviews in areas of expertise

### **Selected conference presentations, publications, and competition entries**

Ermann, M, "Building Assemblies: Insulation and Moisture Management," Presented to AIA Blue Ridge, Roanoke, Oct 2017 (invited paper).

Ermann, M, Hulva, A, Upthegrove, T, Rehfuss, R, Haim, W, Kanapesky, A, Mcmillon, T, Park, C, Reardon, A, Rynes, J, Ye, S, Nichols, C, "Subjective perception and preference of simulated sound fields," Presented to the 173<sup>rd</sup> meeting of the Acoustical Society of America. Boston, June 2017 (Invited Paper).

Hulva, A\*, Rynes, J\*, Rehfuss, R\*, Kanapesky, A\*, Reardon, A\*, Ye, S\*, Ermann, M, "Mapping speech transmission index (STI) and background noise in university classrooms," Presented to the 173<sup>rd</sup> meeting of the Acoustical Society of America. Boston, Jun 2017 (invited paper).

Rehfluss, R\*, Ermann, M, Sullivan M, King, N, “Exploring novel, beautiful, durable, hard, smooth, acoustically absorbent materials,” Presented to the 173<sup>rd</sup> meeting of the Acoustical Society of America. Boston, June 2017.

Ermann, M, “Architectural acoustics classroom demonstrations,” selected for an hour-long presentation, Society of Building Science Educators meeting, San Francisco, Jul 2016

Ermann, M, Hulva, A, Schilb, E, Rife, D, Rehfluss, R, Hull, K, “Parametric acoustics in architecture,” Presented to the 171<sup>st</sup> meeting of the Acoustical Society of America. Salt Lake City, May 2016. (invited paper)

Hulva, A Ermann, M, Hull, K, Rehuff, R, Kanapesky, A, Reardon, “Linking design decisions to speech intelligibility,” Presented to the 171<sup>st</sup> meeting of the Acoustical Society of America. Salt Lake City, May 2016. (invited paper)

Ermann, M, “Noise, illustrated,” Presented to the 171<sup>st</sup> meeting of the Acoustical Society of America. Salt Lake City, May 2016.

Ermann, M, Serrano, E, Byker, C, Calvey, R, “Do elementary school children eat less in noisy cafeterias?,” Presented to the 167<sup>th</sup> meeting of the Acoustical Society of America. Providence, May 2014.

A version of this paper also presented as Byker, C, Serrano, E, Ermann, M, Farris, A, “The impact of cafeteria noise on school lunch consumption: a plate waste study,” Meeting of the International Society for Behavioral Nutrition and Physical Activity, Poster Session, San Diego, Jun 2014.

Ermann, M, “Architectural Acoustics Illustrated,” ArchEx, the Virginia statewide American Institute of Architects (AIA) conference, Nov 2014 (invited paper)

Ermann, M , Nawazish, N, Zawistowski, M, Zawistowski, K, Argentina, V, Yourshaw, M, Duda, L, Ezure, M, Stephenson, S, Terrill, T, Shelton, I, Yeh, S, Lee, K, Duong, H, Sikora, B, Naegele, L, Atkins, T, Ellison, D, Nelson, M, Schafer, L, Skelton, E, “Architectural acoustics illustrated, animated, designed, and built,” Presented to the 167<sup>th</sup> meeting of the Acoustical Society of America. Providence, May 2014.

Jaramillo, A, Ermann, M, Miller, P, “What do teachers think about noise in the classroom?” Presented to the 167<sup>th</sup> Meeting of the Acoustical Society of America, Providence, May 2014.

Ermann, M, Serrano, E, Byker, C, Calvey, R, (invited paper) “Do elementary school children eat less in noisy cafeterias?” Presented at the 167<sup>th</sup> meeting of the Acoustical society of America. Providence, May 2014.

A version of this paper also presented at the Meeting of the International Society for Behavioral Nutrition and Physical Activity, San Diego, 2014.

Jaramillo, A, Ermann M, "Linking HVAC type and student achievement," Presented at the 163<sup>rd</sup> meeting of the Acoustical Society of America. Hong Kong, May 2012 (invited paper)

A version of this paper also presented at the Institute for Noise Control Engineering (INCE) Inter-noise conference (invited paper), New York City, Aug 2012; at the Society of Building Science Educators meeting, Idaho, Jun 2012; at the 164<sup>th</sup> meeting of the Acoustical Society of America (invited paper), Kansas City, Nov 2012; and at the Architectural Research Centers Consortium meeting, Charlotte, Mar 2013 (invited paper);

#### Shift Boston Floating Barge Design Competition

Ermann, M, Vernon, Han, J,\* "Sound barge, Mar 2011. See [here](#).

Ermann, M, Meslar, S, Fields, K, Robinson, S, Ota, E, Warren, C, Ritchie, R, Morrison, W, Stricker, K, Kroon, J, White, K, Jennings, J, Hughes, A, Lee, Z, Nelson, WJ, Hellyar, A "Listening to Architecture," Presented to the North Carolina chapter of the Acoustical Society of America. Raleigh, Mar 2010.

Ermann, M, Vernon, M, Jaramillo, A, Barnobi, C, Han, J, "Fields everywhere," Presented at the 160<sup>th</sup> meeting of the Acoustical Society of America. Cancun, Nov 2010.

Ermann, M, "The costs and benefits of LEED," presented to the United States Green Building Council (USGBC) Southwest Virginia Chapter, Blacksburg, Jul 2009.

Ermann, M, Crawford, N, Mitchell, J, Kim, S, Victor, JS, Massengill, A, Green, J, Field, B, Smith, S, Van Wagner, M, "Thirteen findings in ten minutes," Presented to the 157<sup>th</sup> meeting of the Acoustical Society of America. Portland, May 2009.

#### Metropolis International Design Competition

"Translucent Night Insulation", 2009. See [here](#).

Ermann, M, "Building ventilation and acoustics for people who don't know much about building ventilation," Presented to the 157<sup>th</sup> meeting of the Acoustical Society of America. Portland, May 2009.

Ermann, M, Wheeler, J, Davis, L, "The three little pigs: passive thermal in straw, wood, and brick," Society of Environmental Journalists annual meeting. Roanoke, Oct 2008.

Ermann, M, "Geothermal heat pumps and acoustics for people who don't know much about geothermal heat pumps," Presented to the 156<sup>th</sup> meeting of the Acoustical Society of America. Miami, Nov 2008.

Ermann, M, Jaramillo, A, Victor, JS, Barnobi, C, Thompson, A, McDermott, M "Acoustics, translated into the language of architecture," Presented to the 156<sup>th</sup> meeting of the Acoustical Society of America. Miami, Nov 2008.

Ermann, M, "The five sensitivities of coupled volume concert halls: a compendium," published by the Architecture|Music|Acoustics Symposium. Toronto, Jun 2006. (invited paper)

Ermann, M, "Fan noise rule-of-thumb method for architects," Presented to the North Carolina chapter of the Acoustical Society of America. Raleigh, Apr 2006. Invited paper.

Ermann, M, "Shifting edges: beach town urbanism," *Dichotomy*, Vol 16, Fall 2006.

Ermann, M (invited), "Five sensitivities of the coupled volume/double sloped system," Presented to the 148<sup>th</sup> meeting of the Acoustical Society of America. San Diego, Nov 2004 (invited paper).

Ermann, M, "Towards aural opacity—across a visually transparent medium," presented to the 148<sup>th</sup> meeting of the Acoustical Society of America. San Diego, Nov 2004.

Ermann, M, "Case studies in sustainable design," presented at the Meeting of the Society of Building Science Educators (SBSE). Columbus, Indiana, Aug 2003.

Session chair and creator, "Three views of great green: Sustainable architectural case studies," *Building Virginia* Conference, American Institute of Architects (AIA). Richmond, Virginia, Nov 2003.

Twenty five other papers, most of them presented at Acoustical Society of America conferences, on the topics of coupled volume concert halls, haptic perception of sound within a space, sound transmission loss through transparent media, the translation of acoustic principles into an architectural language, and urbanism.

## **TEACHING**

### **Environmental Building Systems Course Sequence**

Required, two-semester 140-person undergraduate lecture class, covering sustainability, thermal comfort, indoor air quality, human performance, heat transfer, passive and active heating and cooling, HVAC, plumbing, electricity, vertical transportation, daylighting, electric lighting, LEED, room acoustics and noise control.

### **Advanced Architectural Acoustics**

Graduate and upper-level undergraduate 10-person seminar class focusing on room acoustics, noise control, and community noise.

### **Design Studio**

All seven undergraduate and graduate design studios taught, freshman design through masters thesis, focusing on rigorous exploration of design through making. See select student work [here](#).

### **Design at Every Scale**

Walking-tour and field-trip-oriented course for graduate students not enrolled in architecture or design fields

Improving teaching: Large class teaching certificate, 2015 and four other classes aimed at improving teaching outcomes, 2001-present



Other Courses Taught: Building Assembly (materials and methods of construction, instruction within studio), Building Analysis (architectural case study investigation), Architectural Structures, Undergraduate and Graduate Thesis (student-directed design studio projects), Integrative studio (fostering professional and technical competence).

Selected as primary thesis/dissertation professor

15 graduate students

70 undergraduate students

33 students earned awards, external to Virginia Tech, in [architectural acoustics](#), [architecture](#), industrial design, photography, and research, where my role was that of the primary mentor

25 more students earned awards internal to Virginia Tech

## **SELECTED OUTREACH ACTIVITIES**

Historic review board. Appointed by town council to town of Blacksburg historic district architecture review board, 2016-2019.

Acoustics in technology and the arts, Virginia Tech institute for Creativity, Arts and Technology (ICAT) working group, 2015-2018.

Thirteen student design competitions created, curated, or administered, 2005-present

Interviewed on 11 different podcasts.

For examples

1. Architect Magazine, "[How to design the acoustics of a concert hall](#)"
2. TRXL, "[Going deeper than the surface we're scratching](#)"
3. Architect Magazine, "[5 mistakes to avoid when designing an acoustic space](#)"
4. Architect Magazine, "[How can architects better understand sound?](#)"

BuildingGreen

"The Sound of Sustainability: Acoustics in High-Performance Design" Interviewed for popular press article, 6 Sep 2017. See [here](#).

Discovery News

"Mobile, Inflatable System Blocks Outside Noise: Discovery News" (Discovery Channel's online web magazine), interviewed for a popular press article, Nov 2011. See [here](#).

Washington Post, Slayter, M E, "Make your noisy home hush" 10 Feb 2008, p. F6.

Interviewed for popular press article. see [here](#).

## **Professional Service**

Pro bono consulting 12 projects on-campus, statewide, and internationally; 65 guest lectures; 55 studio reviews for other faculty; 20 lobby exhibits; 45 letters of support written for faculty awards, staff recognition, and faculty promotion; 12 university committees; 100+ campus tours to prospective students

Created a [ranking of architecture schools by licensure pass rates](#)

**Community Service**

Blacksburg Master Plan, Miller-Southside Neighborhood Content coauthor, 2005. See [here](#).

Weekly elementary school volunteer, 2012-2018, Basketball and soccer coaching, 20 seasons

**Technical Skills**

Acoustic Measurements: Noise criteria (NC), transmission loss/sound transmission class (TL/STC), impact insulation class (IIC), impulse response, model spark testing, speech transmission index (STI), reverberation time (RT), room acoustics simulation and auralization software, LEED Accredited Professional (AP)

Other: Lighting measurements, thermal measurements, power and energy measurements, solar geometry measurements, AutoCAD 2-D and 3-D, Adobe suite.