

MOJTABA NAVVAB, Ph.D., FIES

Education

University of Michigan, Ann Arbor, MI, Ph.D., 1994

University of Michigan, Ann Arbor, MI, Certificate of Simulation & Gaming, 1993

University of California, Berkeley, CA, M. Arch. 1981

University of California, Berkeley, CA, B.Arch., 1979

Academic, Research and Practice Appointments

Associate Professor of Architecture, (1997 to Present)

University of Michigan, A. Taubman College of Architecture and Urban Planning, Ann Arbor, MI.

Visiting Professor - SAPIENZA University of Roma, Roma, Italy

Department Astronautical, Electrical, and Energetic Engineering (DIAEE), Roma, Italy.

(November – December 2012) and (June - August 2015 and 2016)

Fulbright Specialist Grant in Engineering Education, (August 2013)

J. William Fulbright Foreign Scholarship, The Bureau of Education and Cultural Affairs of the US Department of State and the Council for International Exchange of Scholars (CIES), Institute of International Education (IIE), Specialist Grantee, ID #5191, School Light and Vision, National University of Tucuman, Tucuman, **Argentina**

Visiting Scholar - (September - October 2012)

Fraunhofer Institute of Computer Architecture and Software Technology, Berlin, Germany.

Visiting Scholar - (Jan 1999 - June 1999)

University of Fukuyama, Fukuyama, Japan

Senior Architect - (1997 to Present)

University of Michigan, Architectural Engineering and Construction, Ann Arbor, MI

Research Architect - (1985 to 1996)

University of Michigan, Architectural Engineering and Construction, Ann Arbor, MI

Assistant Professor of Architecture, (1985 to 1996)

University of Michigan, TCAUP, Ann Arbor, MI

Research Scientist (1981-1985)

University of California, Berkeley, Lawrence Berkeley National Laboratory, Berkeley, CA

Administrative Appointment

Chair of the Senate at the University of Michigan, Ann Arbor, MI., (2000 to 2002)

and Chair of the Senate Advisory Committee on University Affairs (SACUA)

Chair of Certificate Program in Simulation & Gaming, (1994 to Present)

University of Michigan, Rackham School of Graduate Studies, Ann Arbor, MI

Teaching Areas

Acoustics, Daylight, Electric Light, LEED Certification, Building Energy Efficiency, CFD Modeling and Simulation, Photovoltaic System, Environmental Controls, Research Methods, Simulation and Gaming, Integrated Resource Planning. Application of Environmental Technology within Virtual Environment.

CV

PUBLICATIONS

Book Chapter

- 2018 Mojtaba Navvab*, Chiara Burattini†, Fabio Bisegna† and Franco Gugliermetti†
* University of Michigan, Ann Arbor, MI, United States, †Sapienza University, Rome, Italy.
Chapter 8.1, Efficient Lighting Systems, Title of the Book: “A Life Cycle Approach, Handbook of Energy Efficiency in Buildings”, by Elsevier 1st Edition, Editors: Umberto Desideri, Francesco Asdrubali, eBook ISBN: 9780128128183, Paperback ISBN: 9780128128176, Imprint: Butterworth-Heinemann, Published Date: 12th November 2018. <https://www.elsevier.com/books/handbook-of-energy-efficiency-in-buildings/desideri/978-0-12-812817-6>.
- 2011 T.W. Hall, M. Navvab, E. Maslowski, and S. Petty , Chapter 11 "Virtual Reality as a Surrogate Sensory Environment", Title of the Book: "Advances in Robotics and Virtual Reality", by Springer's Intelligent Systems, Reference Library, <http://www.springer.com/series/8578>, Author : Tauseef Gulrez, Ph.D., Head Intelligent Machines & Robotics Research Group, Department of Computer Science, COMSATS Institute of Information Technology, M.A. Jinnah Campus, Lahore, Pakistan, <http://cimr.ciitlahore.edu.pk> ISBN 978-3-642-23362-3. <http://www.springer.com/engineering/computational+intelligence+and+complexity/book/978-3-642-23362-3>

Patent:

- 2017 U.S. Provisional Application No.: 62/450,678, Filing Date: January 26, 2017
Title: HOSPITAL DOOR NOISE SUPPRESSOR, Inventor: Mojtaba NAVVAB
UM Ref: 7283; HDP Ref: 2115-007283-US-PS1
- 2017 U.S. Provisional Application No.: 62/480,579, Filing Date: April 3, 2017
Title: EYEWEAR FOR AUTOMATICALLY DETECTING AND BLOCKING SOURCES OF GLARE,
Inventor: Mojtaba Navvab, UM Ref: 7284; HDP Ref: 2115-007284-US-PS1

Peer Reviewed Journal Articles

- 2016 Navvab, M., “Measurable Domain for Crowd noise in Modern stadiums and Arenas”, Journal of Acoustic Society of America, Vol. 139, No 4, Pt. 2 of 2, p 2008, April 2016.
- 2016 Navvab, M., “Room acoustic design, measurements and simulation techniques to reduce hospital noise within patients’ environment”, Journal of Acoustic Society of America, Vol. 139, No4, Pt.2 of 2, p 2024, April 2016.
- 2015 Peter M. Farrehi, Brahmajee K. Nallamothu, Mojtaba Navvab”, Reducing Hospital Noise with Sound Diffusing Material: A Controlled Study”. BMJ Qual Saf 2015; 0:1–3. Doi:10.1136/bmjqs-2015-004205.
- 2014 Navvab, M., “Opinion: Simulation in lighting design and research”, LR & T. 2014; Vol. 46:92
- 2014 Mojtaba NAVVAB, Gunnar HEILMANN, Andy MEYER, Sébastien BARRÉ, “Simulation of Concert Halls’ Room acoustic Characteristics toward Sustainability of their cultural Heritage”, Culture and Computer Science. Published in “Reality and Virtuality” by Franken-Wendelstorf, etl. PP. 29-48, ISBN: 978-3-86488-064-3.
- 2013 Mojtaba Navvab, Fabio Bisegna, Franco Gugliermetti , “Experiencing the Tangible Past through Virtual Reconstruction: Cultural Heritage of Buildings and their Environmental Boundaries”, Cultural Heritage Archeomatica N°3, September 2013, pp36-41
- 2012 Navvab, M., "Measurable Domain for Colour Differences within Virtual Environment", Jour. of Light and Engineering Vol.20, No. 3, pp. 71-81, 2012, ISSN 02362945, Published in English & Russian- ISSN 0039-7067, Svetotechnika, Vol.20, No. 2, pp. 53-61, 2012.

CV

- 2009 Navvab, M., "Daylighting Aspects for Plant Growth in Interior Environments", International Journal of Light and Engineering Vol. 17, No. 1, pp. 46-54, ISSN0236-2945, Published in English & Russian - ISSN 0039-7067, Svetotechnika.
- 2009 Navvab, M., "Modeling Color Appearance of Glazing Systems under Different Daylight Conditions", International Jour. of Light and Engineering Vol.17, No. 3, pp. 92-101, 2009, ISSN 02362945, Published in English & Russian-ISSN 0039-7067, Svetotechnika.
- 2008 Navvab, M., "Full-Scale Testing and Computer Simulation of a Double Skin Facade Building", Journal of Essential Collection of Construction (ECC), July 2008, Page 29-46, ISSN- 1814-0114, Editorial Department: zhoutingwen@sina.com, www.cn-ecc.com, In Chinese and English
- 2007 Varodompun, J., Navvab, M. "HVAC Ventilation Strategies: The Contribution for Thermal Comfort, Energy Efficiency, and Indoor Air Quality", Journal of Green building, 2007.jgb 2(2): p. 131-150.
- 2007 C., Sik La'nyi, Zsolt Kosztya'n, Bala'zs Kra'nicz, J Schanda, and M Navvab", "Using Multimedia Interactive E-teaching in Color Science", JIESNA, LEUKOS VOL 4,No 1,July 2007 PAGES 71- 82
- 2006 Inanici, M., Navvab, M., "The Virtual Lighting Laboratory: Per-pixel Luminance Data Analysis", IESNA, LEUKOS Vol 3 No 2 October 2006 PP 89-104.
- 2006 Sam M. Berman, PhD, Mojtaba Navvab, PhD, FIES, Matthew J. Martin OD, James Sheedy OD, PhD, William Tithof, PHD., "A Comparison of Traditional and high Colour Temperature Lighting on the Near Acuity of Elementary School Children", JLR &T, 38:1, (2006) P41-52.
- 2006 Navvab M., "Application of S/P, C/P and C/S Ratios as Indices for Healthy Lighting "(CIE), Ottawa Canada, ISBN-390190655X-CIEX031-2006
- 2006 Navvab M., "Application and Evaluation of Light Therapy Boxes Used in Working and Living Environment for SAD Conditions", (CIE) Ottawa Canada, ISBN-390190655X-CIEX031-2006
- 2006 Werthan, Audrey Kay, Navvab, M., "Building Design Strategies and Their Contribution to Energy Performance for LEED Certification", Journal of Green building, 2006, doi:10.3992/jgb.V1.n4.p 67-87,
- 2002 Navvab M., "Visual Acuity Depends on the Color Temperature of the Surround Lighting", J. Illumin. Eng. Soc., JIES. Vol.31, No.1: 70-84, Winter 2002
- 2001 Navvab M., "Design and Evaluation of the Final Paint Inspection Lighting System at Two Industrial Auto Plants", J. Illumin. Eng. Soc., JIES. Vol.30: 152, Summer 2001
- 2000 Navvab M., "A comparison of Visual Performance under High and Low Color Temperature Fluorescent Lamps" J. Illumin. Eng. Soc., JIES. Vol.30: 170, Summer 2000
- 1999 Navvab M., "Integration of Daylighting and Sports Lighting Systems Design for Turf Growth in an Indoor Football Stadium", J. Illumin. Eng. Soc., JIES, Summer 1999.
- 1999 Navvab M., "Daylighting System Design and Evaluation of Museum of Contemporary Art", Chicago", J. Illumin. Eng. Soc., JIES. 27(2): 160-174, Summer 1998.
- 1998 Navvab M., "New Technology for Designing Daylighting System for Art Museums", Architectural Record, February 1998.
- 1997 Navvab M., Siminovitch, M., Love, J., "Variability of Daylight in Luminous Environment", J Illumin. Eng. Soc., JIES, winter of 1997.
- 1997 Navvab M., "Application of the CIE Glare index for Daylighting Evaluation", JIES., Summer, 97
- 1997 Uetani Y., Navvab M., "Prediction of Sky Luminance by Meteorological Satellite Images", Japan Journal of Illuminating Engineering Society, Japan, autumn.

CV

- 1996 Navvab M. "Integration of Daylight and Electric Light in a Commercial Building", International Journal of Light and Engineering, a Publisher Allerton Press Inc. Moscow Russia, Fall 1997 Issue, ISSN-0039-7067, in Russian and English.
- 1996 Navvab M., "Scale Model Photometry Techniques under Simulated Sky Conditions", JIES., summer 96
- 1996 Navvab M., "Never Mind the Bollards ... Here's the Rock and Roll Hall of Fame", LD & A, Lighting Design and Application (March 1996): pp.24-30.

Peer Reviewed Conference Proceedings

- 2018 Navvab, M., Fabio, B., Gugliermetti, F., "Smart city lighting System evaluation from Drivers' Point of View", IEEE_EEEIC 2018, June12-15, Palermo, Italy.
- 2016 Navvab, M., Measurable domain for crowd noise in modern stadiums and arenas", Acoustical Society of America, Salt Lake City, Utah, May 23–27, 2016.
- 2016 Navvab, M., Room acoustic design, measurements and simulation techniques to reduce hospital noise within patients' environment", Acoustical Society of America, Salt Lake City, Utah, May 23–27, 2016.
- 2016 Navvab, M., Clear, R., "Estimation of the Adaptation Luminance under Roadway Lighting Condition", IEEE_EEEIC 2016, June7-10, Florence, Italy.
- 2016 Navvab, M., Fabio, B., Cellucci, L., "Defining Pedestrian's Visual Adaptation Field under Night Lighting in Venice", IEEE_EEEIC 2016, June7-10, Florence, Italy.
- 2016 Navvab, M., Fabio, B., Gugliermetti, F., "Dynamic Roadways and In-Vehicle Lighting Conditions within City of Rome", IEEE_EEEIC 2016, June7-10, Florence, Italy.
- 2016 Navvab, M., Fabio, B., Gugliermetti, F., "Capturing ancient theaters sound signature using Beam forming", ICSV23- International Congress on Sound and Vibration, Athens Greece, July 10-14, 2016.
- 2015 Mojtaba Navvab, Robert Clear "Estimation of the Adaptation Luminance under Roadway Lighting Conditions", 28th CIE Session in Manchester, United Kingdom, June 28 - July 4, 2015.
- 2015 Mojtaba Navvab, "Photometric Evaluations for Pedestrian Environment with Emphasis of Light Spectrum at the Mesopic level", 28th CIE Session in Manchester, United Kingdom, June 28 - July 4, 2015.
- 2015 Mojtaba Navvab, Fabio Bisegna, Franco Gugliermetti, "Dynamic Roadways and in-vehicle Lighting Conditions for Determining Mesopic Adaptation Luminance", IEEE 2015, Session in Rome, Italy, June 9 June 11, 2015.
- 2014 Gunnar Heilmann, Mojtaba Navvab, Magdalena Boeck, Benjamin Vonrhein, "Acoustic Study and Visualization of a Complex Echo at the Klondike Bluffs, in the Arches National Park", Inter-noise 2014, November16-19, Melbourne Australia.
- 2014 Mojtaba NAVVAB, Gunnar HEILMANN, Andy MEYER, Sébastien BARRÉ, "Simulation of Concert Halls' Room acoustic Characteristics Toward Sustainability of their cultural Heritage", Culture and Computer Science 22 - 25 May 2014 in Berlin, Germany. Published in "Reality and Virtuality" by Franken-Wendelstorf, etl. PP. 29-48, ISBN: 978-3-86488-064-3.
- 2014 Mojtaba Navvab, Richard Perez, Hayato Hosobuchi, "The Estimated Frequencies of CIE Sky Luminance Distributions and the Impact of the Circumsolar Region Using TMY Weather Files", American Solar Energy Society (ASES), 7-10 July 2014, San Francisco, Ca., USA.
- 2014 Mojtaba Navvab, "Virtual Reality as a Surrogate Sensory Environment for Evaluation of Human Luminous Environment", Proceedings of the ISCC/CIE Division 2 within Annual Inter-Society Color Council (ISCC), Color, Light and Appearance, 16-20, June 2014 NIST, Gaithersburg, Maryland, USA.
- 2014 Mojtaba Navvab, Peter Farrehi, Forooz Shahbazi, Andy Meyer, "Application of Beamforming Techniques to Localize and Reduce Noises within Acute Care Patient Environment", BeBEC-2104-29, Berlin, Germany, Feb 19-20, 2014, ISBN976-3-

CV

942709-12-5

- 2014 Mojtaba NAVVAB, Fabio BISEGNA, Gunnar HEILMANN, and Magdalena BÖCK, "Capturing Historical Building Space Sound Signature Using Beamforming", BeBEC-2104-27, Berlin, Germany, Feb 19-20, 2014, ISBN976-3-942709-12-5
- 2013 Mojtaba Navvab, Fabio Bisegna, Franco Gugleirmetti, "Evaluation of Historical Museum Interior Lighting System Using Fully Immersive Virtual Luminous Environment", SPIE Optical Metrology, 13 - 16 May 2013 in Munich, Germany. Proc. SPIE 8790, Optics for Arts, Architecture, and Archaeology IV, 87900F (May 30, 2013); doi:10.1117/12.2020535.
- 2013 Mojtaba Navvab, Fabio Bisegna, Franco Gugleirmetti, "Virtual Reconstructions, Visualization, Auralization and Interaction within a Cultural Heritage buildings and Sites", Culture and Computer Science 22 - 25 May 2013 in Berlin, Germany. Published in "Visual World and Interactive Space" by Regina Franken-Wendelstorf, etl., PP. 131-146, ISBN: 978-3-86488-045-2.
- 2012 Navvab, M., "Dynamic Variation of the Direct and Reflected Sound Pressure Levels Using Beamforming", Berlin, Beamforming Conference, Feb22-23, 2012. ISBN: 978-3-94270904-0.
- 2012 Navvab, M., "Simulation, visualization and perception of sound in a virtual environment using Beamforming" Berlin, Beamforming Conference, Feb22-23, 2012. ISBN: 978-3-94270904-0.
- 2011 Navvab, M., "Acoustic Performance of Ancient Theatres: Ancient versus Virtual architecture" conference on "Acoustics of Ancient Theatres" organized by the European Acoustics Association, Petra, Greece. on September 18-21, 2011.
- 2011 Navvab, M., "Measurable Domain for Color Differences within Virtual Environment", CIE 27th session, Sun City, July 9-16th South Africa 2011.p430-440, ISBN 978 3 901906992.
- 2011 Navvab, M., "Plant Lighting Aspects for Plant Growth in Controlled Environments", CIE 27th session, Sun City, July 9-16th, South Africa 2011, p246-256, ISBN 978 3 901906992.
- 2010 Navvab, M., "Application of the Head Related Transfer Function (HRTF) in Room Acoustic", Berlin, Beamforming Conference, (BeBeC), Germany, Feb 20 – 25th, 2010, ISBN 978-3-00-030027-1
- 2010 Navvab, M., "Crowd Noise Measurement and Simulation in Large Stadium Using Beamforming", 11th, International Building Performance Simulation Association, IBPSA, Glasgow, Scotland July 27-30, 2009
- 2009 Navvab, M., "Photometric Evaluations for Pedestrian Environments" Light and Lighting 2009" Conf., Budapest, Hungary 27-29 May 2009.
- 2008 Navvab, M., "Crowd Noise Measurement in Large Stadium using Beamforming", Berlin, Beamforming Conference, (BeBeC), Feb 2008. ISBN: 978300028499.
- 2008 Navvab, M., "Daylighting Aspects for Plant Growth in Interior Environments", CIE-SDR, 10082k9, p297-306. ISBN: 978-961-248-127-8 (CIE) Division 3 within the 17th Conference by the Lighting Engineering Society of Slovenia (SDR) Ljubljana, October 7 - 9, 2008. [English & Slovenian](#)
- 2008 Navvab, M., "Modeling Color Appearance of Glazing Systems under Different Daylight Conditions", CIE-SDR, 10082k9, p261-270. ISBN: 978-961-248-127-8 (CIE) Division 3 within the 17th Conference by the Lighting Engineering Society of Slovenia (SDR) Ljubljana, October 7 - 9, 2008. [English & Slovenian](#)
- 2007 Navvab, M., "Spectral Variability of Daylight and Electric Light at the Eye in Working Environments", CIE, Beijing China, June 2007.
- 2007 Navvab, M., "Physically Based Renderings of Color Appearance of Glazing Systems under Different Daylight Conditions". CIE, Beijing China, June 2007

CV

- 2007 Navvab, M., J. Varodompun. "Pedestrians' Comfort Index in Urban Settlements using CFD Analysis" EPIC 2006 AIVC Technologies & Sustainable Policies for a Radical Decrease of the Energy Consumption in Buildings. 2006. Lyon, France: AIVC.
- 2006 Navvab, M., J. Varodompun. "Thermal Performance of A Double Skin Facade Building using Full-Scale Testing and Computer Simulation", ISES/ASES Renewable Energy Key to Climate Recovery 2006. Denver, Colorado: ISES/ASES.2006.
- 2006 Navvab, M., J. Varodompun. "Efficiency of Building-Integrated Photovoltaic System", Renewable Energy Key to Climate Recovery 2006. Denver, Colorado: ISES/ASES 2006 .
- 2006 Navvab, M., "Visual performance Analysis of Office Occupants Working under High and Low Color Temperature Fluorescent Lamps", EPRI/LRO, Lighting Design For Health, Feb 8th, Orlando, Florida, 2006.
- 2005 Navvab M., "Spectral variability of daylight within the luminous environment", International Commission on Illumination (CIE) Conference, Leon, Spain, May 2005.
- 2005 S. Berman, Navvab, M J. Martin J Sheedy, W. Tithof, "Children's Near Acuity is Better under High Colour Temperature Lighting " International Commission on Illumination (CIE) Conference, Leon, Spain, May 2005
- 2005 Navvab M, "Application of Equivalent Mesopic Luminance and S/P Ratio for Exterior Lighting Design Evaluations" "Special session on Exterior lighting", CIE – Leon Spain, 2005.
- 2005 Navvab M., "Full-Scale Testing, Computer Simulation of a Double Skin Façade", International Building Performance Simulation Association, IBPSA, Montréal, Canada July 2005.
- 2005 Varodompun, J, Navvab, M., "Solar and Daylight Performance of a Building with Glass Roof and Multilateral Glass Shading System. ISES 2005 conference proceeding. Florida 2005.
- 2005 Navvab M., Varodompun, J., "Solar, Daylight, Thermal and Airflow Performance of a Botanical garden. ISES 2005 conference proceeding, Florida, 2005.
- 2005 Navvab M., Varodompun, J., "Qualitative and Quantitative Evaluation of Michigan Solar Decathlon Home", ISES 2005 conference proceeding, Florida, 2005.
- 2003 Navvab M., "Validation of Algorithm for Daylight Indoors and Outdoors" CIE152-2003, Division 3, ISBN-3901-906215.
- 2001 Navvab M., "Lighting Design Application for Plant Growth", International Lighting Congress", CIE Divisional Istanbul, September 11, 2001.
- 2001 Navvab M., "Scale model Photometry Techniques", International Lighting Congress, CIE Divisional Istanbul, Turkey September 11, 2001.
- 1999 Navvab M., "Lighting and Daylighting Design for Plant Growth", IESNA Annual Conference, in New Orleans, August 9-11th, 1999.
- 1997 Navvab M., Uetani, Y., "Design and Evaluation of the Final Paint Inspection, Lighting system at two Industrial Auto Plants", Lux Pacifica, Japan, Fall 1997.
- 1997 Uetani Y., Navvab, M., Kim, H. Suh "Prediction of Sky Luminance by Meteorological Satellite Images", Lux Pacifica, Japan, Fall 1997.
- 1997 Uetani Y., Navvab, M., Kim, H. Suh "Prediction of Daylight Illuminance by Meteorological Satellite Images", Lux Pacifica Conference, Japan, Fall 1997.

CV

- 1997 Altland G. Duke R., Navvab M., "Design and Development of the Value Center Management Game for the University of Michigan", ISAGA Conference, Tilburg, Netherland, July 7-11, 1997.
- 1997 Navvab M., Duke, R. "Taxonomy of Simulation & Gaming Theory", ISAGA Conference, Tilburg, Netherland, July 7-11, 1997.
- 1997 Navvab M., Duke, R. "Simulation and Gaming as a Well Defined Discipline", ISAGA Conference Tilburg, Netherland July 7-11, 1997.
- 1997 Navvab M., "Environmental Design Simulation" Ampro Garcia, Frances Watts - Editors (SPAIN); 'Simulation-Now, Learning through Experience: The Challenge of Change' International Simulation and Gaming Association (ISAGA) & Department of Information Technology at the Poly technique University of Valencia, Spain. (ISBN-84- 7795-1997-8): pp. 167-185.
- 1996 Navvab, M., "Recreation/Simulation for Environmental Design", ACSA Western Regional, Conference, Hawaii, Feb.4-7, 1996.
- 1996 Navvab M., "Simulation of Management Strategies for Operation of Institutional Buildings, ISAGA Conference, Jurmala, Latvia, July 17-19, 1996.

Peer Reviewed Technical Committee Reports

- 2011 CIE-TC6-42, "Lighting Aspect for Plant Growth in Controlled Environment", Technical Committees (TC) within CIE Division 6, Final draft was presented during the CIE 27th session, Sun City, July 9-16th, South Africa 2011, ([In progress](#))
- 2011 LM-50, "Exterior Lighting Design Practice Guide". Report by the Exterior Lighting Measurements Committee, within Illuminating Engineering Society of North America, www.IESNA.org, ([In progress](#))
- 2010 IESNA - RP-05, "Daylighting Design Practice Guide". Report by the Daylighting Committee within Illuminating Engineering Society of North America, www.IESNA.org, ([In progress](#))
- 2007 UM Architectural Engineering and Construction, "UM-Outdoor Lighting Design Guideline-16521", Building Exterior, Parking Lots, Street and Pedestrian Lighting Design, June 2007.
- 1999 CIE-TC-3.11, "Daylighting Calculations", TC report was presented to Division 3 during the 24th Session of the (CIE) in Warsaw Poland, June 23rd to 31st, 1999.
- 1999 CIE. TC-3.19, "Photometry Techniques in Lighting Design", TC report was presented to Division 3 during the 24th Session of the (CIE) in Warsaw Poland, June 23rd to 31st, 1999.
- 1999 CIE. TC-3.32, "Validation of Algorithm for Daylight Outdoors", TC report was presented to Division 3 during the 24th Session of the (CIE) in Warsaw Poland, June 23rd to 31st, 1999.

Peer Reviewed Publication Co-Authored with Recent Students.

- 2011 Utami, S. S., Navvab, M., and Corey, J. "Synchronizing Auditory and Visual Sensation in Computer-Simulated Environments", 41st International Conference: Audio for Games.
- 2011 Utami, S. S., Navvab, M. "Utilizing Virtual Reality for Simulating the Auditory Perception in Architectural Designed Spaces, "The 2011 Annual Architectural Research Centers Consortium Spring Research Conference, and Detroit, MI, USA.
- 2011 Utami, S. S., and Navvab, M. "Impacts of Architectural Design Variables to Diffusion in Room Acoustics", the Journal of the Acoustical Society of America 129, 2503.

CV

- 2011 Utami, S.S., Navvab, M., "Room Acoustics Simulation of Hospital Patient Care-Unit", Journal of the Acoustical Society of America, p129, 2668.
- 2011 Yimprayoon, C., Navvab, M. "Impact of Different Weather Data Sets on Photovoltaic System Performance Evaluation", the 2011 Annual Architectural Research Centers Consortium Spring Research Conference, Detroit, MI
- 2011 Yimprayoon, C., Navvab, M., "Applications of Grid-Connected Photovoltaic System in Large Institutional Buildings", Solar 2011, Raleigh, NC, USA.
- 2010 Utami, S. S., and Navvab, M. "Simulating Diffuseness with Geometry Variations of Room Surfaces", The Journal of the Acoustical Society of America 127, Issue 3, 1752-1752.
- 2010 Yimprayoon, C., Navvab, M., "Quantifying the Location Advantage on Solar Energy Production Case Study: Solar Decathlon Completion", ASES, 2010, National Conference, May 17-22nd, Phoenix Arizona, USA.
- 2010 Yimprayoon, C., Navvab, M., "Residential Housing Photovoltaic System performance in Northern Climate", International High-Performance Building Conference, 2010, Purdue, USA...
- 2007 Varodompun, J., Navvab, M. "HVAC Ventilation Strategies: The Contribution for Thermal Comfort", Energy Efficiency, and Indoor Air Quality. Journal of Green building, 2007.jgb 2(2): p. 131-150.
- 2007 Varodompun, J., Navvab, M. "The Full Scale and CFD simulation of Impinging Jet Ventilation", IAQVEC07: Indoor Air Quality, Ventilation and Energy Conservation in Buildings, Sendai, Japan 2007.
- 2007 Varodompun, J., Navvab, M. "The Impact of Terminal Configurations in Impinging Jet Ventilated Room" IAQVEC07: Indoor Air Quality, Ventilation, and Energy Conservation in Buildings. 2007. Sendai, Japan.
- 2006 Varodompun J., Cotel A., Navvab M., "Ventilation Performances of Mixing, Displacement, and Impinging Jet system under different HVAC scenarios: **PART I**" EPIC 2006 AIVC Technologies & Sustainable Policies for a Radical Decrease of the Energy Consumption in Buildings. 2006. Lyon, France: AIVC.
- 2006 Varodompun J., Cotel A., Navvab M., "Ventilation Performances of Mixing, Displacement, and Impinging Jet system under different HVAC scenarios: **PART II**" EPIC 2006 AIVC Technologies & Sustainable Policies for a Radical Decrease of the Energy Consumption in Buildings. 2006. Lyon, France: AIVC.
- 2006 Werthan, Audrey Kay, Navvab, M., "Building Design Strategies and Their Contribution to Energy Performance for LEED Certification Journal of Green building, 2006, doi:10.3992/jgb.V1.n4.p 67-87
- 2006 Melaka N., Navvab, M., "The Virtual Lighting Laboratory: Per-pixel Luminance Data Analysis", IESNA, LEUKOS Vol 3 No 2 October 2006 PP 89-104.

Peer Reviewed Publication by Others on the Projects

- 2011 Greg Blackman, "Optical Archaeology", Technology - Portable Spectroscopy, UM Measuring Plants, Spectral Reflectance Electro-Optic Magazine, May 2011, PP20-23, see www.electrooptic.com.
- 2010 Application Note: "Room and Building, Acoustics", <http://www.acoustic-camera.com/en/applications>.
- 2008 Kermposky Mary, Associate Editor, "Pushing the Envelope", CAM Magazine, Green Building Product, Page 36-41, Green Roof Project in collaboration with the A3C architect in Ann Arbor, <http://www.a3c.com/sustainability/sustainable-showcase.html>,
- 2003 Walerczyk Stan, Letters to The Editor, "It is Wrong to Presume Scotopic Enhancement is Our Only Spectral Variable" Lighting Design + Application, Feb. 2003, P4-6.

CV

- 2002 Deborah Snoonian, P.E., "Man as Meter", at the University of Michigan, an electronic classroom is home to cutting-edge audiovisual research. Architectural Record. (09/2002): 206-210, 8 Sep 2002, and www.architecturalrecord.com - Digital practice - 09/2002
- 1999 Justin Henderson "Universities Research Lighting - Three Academic Programs Offer Practical Tools to Improve Lighting and Energy Efficiency" Architectural Record (09/1999): 110- 115.
- 1998 Stefan Graf, "Lighting Retail -"The Wonderful Retail World of Disney", Lighting Design and Application, June 1998.
- 1997 Trauthwein Christina, "World of Disney", Architectural Lighting, Jan/Feb. 1998. This project was given the EPRI, International Lighting Design Award, 1997, sponsored by IESNA. Article discussing Project by Stefan Graf, Illuminart and Mojtaba Navvab
- 1997 Yee Roger, "Mickey Gets Wings", Contract Design Magazine, Feb. 1997, Article discussing Project by Stefan Graf, Illuminart and Mojtaba Navvab

Doctoral Dissertations & Certificate in a given Specialty Area within Environmental Technology

- 2011 Subject Area: **PHOTOVOLTAIC SYSTEM**, Chanikarn Yimprayoon
"The Utilization of Grid-Tied Photovoltaic System in Architecture"
- 2011 Subject Area: **ROOM ACOUSTIC**, Sentagi Sesotya Utami
"Characterizing the Audibility of Sound Field with Diffusion in Architectural Space"
- 2008 Subject Area: **VENTILATION AND FULL SCALE AND CFD SIMULATION**, Jatuwat Varodompun, "Architectural and HVAC Applications of Impinging Jet Ventilation using Full Scale and CFD Simulation"
- 2004 Subject Area: **LIGHTING AND COMPUTER SIMULATION**, Mehlika Inanici , "Transformations in Architectural Lighting Analysis: Virtual Lighting Laboratory"
- 2001 Subject Area: **LIGHTING FOR PLANT GROWTH**, Artiwan Shotipruk, PhD., UM-Chemical Engineering, "Extraction of Bio-Active Compounds from Thai Herbal Plants by Sub- and Supercritical Fluid"
- 1997 Subject Area: **SIMULATION AND GAMING** Greg Altland, "Design and Development of the Value Center Management Game for the University of Michigan"
- 1993 Subject Area: **OFFICE / INDUSTRIAL LIGHTING DESIGN & FULL-SCALE SIMULATION**, Michael Siminovitch, "Efficient Lighting Design in Office and Industrial Applications"
- 1991 Subject Area: **DAYLIGHT DESIGN AND PERFORMANCE SCALED & FULL-SCALE SIMULATION**, James Love, "The Vertical to Horizontal Illuminance Ratio: the New Daylight Performance Indicator".

Courses thought within Taubman College of Architecture and Urban Planning

Ph.D. Program

- (1997-2017) + Arch 739 Master of Science (Ind.) Practicum
- (1997-2017) ** Arch 825 Ph.D. Seminar in Methods for Environmental Technology Area
- (1997-2019) ++ Arch 839 Ph.D. (Ind.) Practicum for Environmental Technology Area
- (1997-2019) ++ Arch 990 Ph.D. (Ind.) (Pre-Candidate)
- (1997-2019) ++ Arch 995 Ph.D. (Ind.) (Candidate)

Graduate Program selective Environmental Technology Courses

- (1997-2019) # Arch 525 Computer Applications in ET
- (1997-2015) # Arch 535 Case Studies in ET
- (1997-2019) # Arch 545 Advanced Lighting Design
- (1997-2019) # Arch 555 Building Systems and Energy Conservation
- (1997-2015) # Arch 565 Research Method in Environmental Technology
- (1997-2019) # Arch 605 Environmental Design Simulations

CV

Under-Graduate Program Environmental Technology Courses

(1985-1999) * 315 ET- I

(1997-2009) * 425 ET- II

The above classes are thought by cluster teams now.

Key:

* Required for Bachelor of Science Degree

** Required for Master of Science and Ph.D. Degree

Elective course for Master of Architecture Degree

+ Course required for Master of Science

++ Course required for Ph.D. Degree

U of Michigan - Certificate in Simulation and Gaming (S/G)

Core Courses within the S and Gaming Certificate Program within Rackham School of Graduate Studies

(1994-1999) ##UP644 Case Studies in Simulation and Gaming

(1994-1999) ##UP664 Seminar - Simulation and Gaming Theory

(1994-1999) ##UP666 Advanced Studio in Simulation and Gaming Design

Key: ## Required for core courses for the S & G Certificate

https://secure.rackham.umich.edu/academic_information/program_details/simulation_and_gaming_studies/

2019, 2018, 2017, 2015, Teaching Exchange and Research Collaboration "International Study Program", Workshop on Simulation Techniques, Chinese University of Hong Kong (**March 2015, Feb + Mar 2017, Feb, + Apr 2018, Mar 1-9, 2019**), the workshop provides an understanding of environmental design methods through the use of commercial and newly-developed specific computer programs. State-of-the-art thermal, lighting, daylighting and acoustical analysis models are introduced through simulation techniques.

2017 – Two Workshops on Simulation Techniques (acoustic, lighting and Thermal), **Total of 7; 3-hrs sessions:** Location: The Chinese University of Hong Kong, Center for Housing Innovations, Room 507, Esther Lee Building, Dr./Prof., Jin Tsou , E- mail: <jinyeutsou@cuhk.edu.hk>; jinyeutsou@gmail.com, **dates: Feb-2017 (12 Hours) and March-2017 (9 Hours)**

2016 – One Seminar on Research Methods: Ph.D. Program at the SAPIENZA University of Roma, Contact: **Prof. /Dr. Franco Gugliermetti**, Faculty of Architecture SAPIENZA University – Rome, Dept Astronautical, Electrical, and Energetic Engineering, Rome, Italy, E-mail: franco.gugliermetti@uniroma1.it, **(June 2016), 3-hrs session** Location: Rome

2016 – One Workshop Energy Performance: LEED compliance and energy performance for commercial buildings. Contact: **Prof./Dr. Fabio Bisegna** , Faculty of Architecture SAPIENZA University – Rome, Dept. Astronautical, Electrical, and Energetic Engineering, Rome, Italy, E-mail: fabio.bisegna@uniroma1.it , **(June 2016), 3-hrs session,** Location: Rome

2013 Fulbright Specialist Grant in Engineering Education, (August 2013)

J. William Fulbright Foreign Scholarship, The Bureau of Education and Cultural Affairs of the US Department of State and the Council for International Exchange of Scholars (CIES), Institute of International Education (IIE), Specialist Grantee, ID #5191

National University Tucumán, Argentina,

Certificate in Engineering, Visual Environment and Efficient Lighting

(Spring 2010 & 2012) **MAVILE** - is a network of European, Latin-American and North American teaching and research groups on lighting, environmental architecture, and psychology, optics and vision. This is programmed for training specialists in the field of visual environment and efficient lighting. The Department of Lighting, Light, and Vision of the National University Tucumán, Argentina, e-mail: ilum@herrera.unt.edu.ar

CV

Courses within Electrical Engineering and Computer Science and Engineering

- (Fall 2010) EECS 498 Special Topics on Solid-State Lighting and Solar Cells
Prof. "Ku, Pc" <peicheng@umich.edu> Invited Lecture
- (1996 -2007) # Eng. 477 / NA 477 -- Principles of Virtual Reality (faculty advisor)
<http://www-vrl.umich.edu/Eng477/advisors.html>, <http://www-vrl.umich.edu/Eng477/>

Sponsored Research (selected)

- 2016-2018 Ford Alliance, Research and Advanced Engineering for Vehicle Design & Infotronics.
2015-2016 Ford Alliance, Research and Advanced Engineering for Vehicle Design & Infotronics.
2013-2015 Illuminating Engineering Society North America, Graduate Grant to support Ph.D. student.
2014-2015 UM – M-Cubed - Virtual reality for evaluation of the human luminous environment
2013-2014 Illuminating Engineering Society New Course Development - Nuckolls Fund GRANT
2013-2014 IESNA - Illuminating Engineering Society 2013 Graduate Grant to support Ph.D. student
2012-2013 OVPR - VR as a Surrogate Sensory Environment for Evaluation of Human Luminous Environment
2012-2013 Application of Minimum Motion Photometry within Virtual Environment
2010-2012 Application of the PV Grid –Tied Systems for Institutional Buildings
2010-2012 Energy Baselines for UM-NCRC Buildings
2009-2012 Lighting and Daylighting for Plants Growth
2005-2012 Exterior Lighting Design for Safety and Security within Institutional Buildings
2009-2012 Application of the Head Related Transfer Functions in Room Acoustics
2008-2009 Sustainable Design Research Laboratories
2008-2008 Energy Baselines for Institutional Buildings
2008-2008 Room Acoustic Design Indicators
2008-2008 Crowd Noise Measurement and Simulation in Large stadium
2007-2008 Enhance Spectrum Lighting System for Circadian Rhythm
2006-2007 HVAC and IAQ Performance Evaluation System & Control
2006-2007 New Room Acoustic Indicators for Evaluation of Recording Studios
2005-2007 Full-Scale Simulation of a Double Skin Façade
2005-2007 Full Scale Acoustic and Lighting Class/Laboratory at U of Michigan
2001-2003 Daylight Spectrum Impact on Visual Acuity within School buildings
1997-2000 Funded Research by N.S.F.- Building Integrated Photovoltaic System / U of M SNR& E
1997-1999 Uni.-Solar & ITI and UM Offices of Plant and Plant Extension

Major New Building Projects within U of M, Ann Arbor (selected): Contribution at different stages of the design process through design studies, building performance analysis and ASHRAE 90.1 compliance, (e.g., schematic, construction docs, specification, bidding, commissioning and audit)

- 2019 UM – Detroit Observatory Building, UM Main Campus
2017 UM - South Athletic Facilities, Glick indoor football facility
2016 Outdoors Track and Field, Sports Lighting and Sound System
2015 Lacrosse Field, Sports Lighting and Sound System
2014 UM-Soccer field - Lighting System
2013 Indoor Track and field – Lighting and Sound System
2012 Field Hockey, Room Acoustic & Sound System
2015 Institute of Social Research - ISR New Atrium Space Addition
2010 North Campus Research Complex - NCRC old Pfizer
2010 Phoenix Memorial LAB - PV system
2009 Player Development Center for Intercollegiate Basketball
2009 Michigan Wrestling Center - Completed Fall 2009
2009 Al Glick Field House Indoor Practice Facility for Football - Completed October 2009
2009 Thompson Street Parking Structure Addition - Completed Fall 2010
2009 North Quad Residential and Academic Complex - Completed Fall 2010

CV

2009 Couzens Hall Renovation
2009 Life Science Electronic Microscope Labs. Completed Jan 2010
2008 Walgreen Drama Center and Stamps Auditorium - Completed Jan 2008
2008 Student Activities Building Renovation - Completed December 2008
2008 Art and Architecture Building Addition - Cancelled Jan 2009 - Solar / PV Moved to UM Utility
2008 Mosher Jordan Renovation and New Dining Center - July 2008
2008 Kelsey Museum Renovation & Addition - Completed October 2008
2008 Ray Fisher Baseball Stadium Renovation - Completed March 2008
2008 Alumni Memorial Hall Museum of Art Addition - Completed November 2008
2008 Alumni Field Renovations and Addition - Completed May 2008
2008 Law School Academic Building and Hutchins Hall Law School Commons Addition
2008 Intercollegiate Soccer Stadium - Completed December 2008
2008 C.S. Mott Children's & Women's Hospitals Replacement Project
2008 Ross School of Business Facilities Enhancement- Completed December 2008
2007 School of Public Health Buildings Addition Renovation - Completed December 2007
2007 Temporal Isolation Laboratory - Completed December 2008
2007 Cardiovascular Center - Completed Summer 2007
2007 Michigan Stadium Renovation and Expansion Project
2006 Rachel Upjohn Ambulatory Psychiatry/ Depression Center/Completed September 2006
2006 Angle Hall Computer Center - NEW HVAC & AIR Distribution - Completed Nov. 2006
2006 Perry Building Addition - Completed March 2006
2006 Computer Science and Engineering Building Completed Winter 2006
2006 Towsley Center for Children Replacement Facility - Completed Fall 2009
2006 Biomedical Engineering Project - Completed August 2006
2005 Law Academic Plaza & Underground Library, MI, Unbuilt, Renzo Piano Bldg. Workshop, Genoa, Italy
2005 Life Sciences Institute Building
2005 Palmer Drive Development Completed - December 2005
2005 Stephen M. Ross Academic Center - Completed December 2005
2005 Biomedical Science Research Building - Completed December 2005
2004 Hill Auditorium Renovation - Completed January 2004
2003 Rackham School of Graduate Studies Building - Completed January 2003
2002 Dana Building Phase II Renovations - Completed Fall 2002
2001 Yost Ice Arena - Completed October 2001

Professional Practice and Architectural Design Projects (selected)

2014-2018 Amazon Headquarter, Seattle, WA, Daylighting and Electric lighting for Spheres- In progress
2014-2017 Sun Life Stadium, Miami, FL, Sound System - In progress
2015-2015 Honda Sports Center, LA, CA. Sound System
2014-2015 Architectural Acoustic Renovation of the Saint Joseph Catholic Church, Dexter, MI
2013-2014 Oakland Coliseums, Oakland, CA, - Sound System
2008-2009 Green Roof Design and Performance Evaluation - MI, A3C Architect, Ann Arbor, MI
2007-2008 M Resort - NV, Marnell Corrao Associates, LV, NV
2007-2008 Acoustic Design for the Recording Studio & Detroit Symphony Hall - MI, DSO, Detroit, MI
2006-2008 Echelon Resort, NV, Revel Resorts - NJ, BLT Architects, Philadelphia, PA
2006-2008 Fountain blue Resort, NV, (LEED), Bergman Wall Associates, LV, NV
2006-2007 MGM Resort - NJ, Kohn Pedersen Fox, NY, NY
2006-2007 Encore Resort - NV, Wynn Design & Development, LV, NV
2006-2007 JPR Architect Inc., Office Building, (LEED), DT, MI
2006-2007 Eli and Edythe L. Broad Institute of MIT & Harvard - MA, Elkus Manfredi Associates, Boston, MA
2005-2007 Wynn Resort - NV, Marnell Corrao Associates, LV,NV
2004-2006 BSRB Building, Double Skin Façade - MI, Polshek Partnership Architects, NY, NY
2004-2005 China National Off-shore Oil Company's Building -CNOOC-China, Kohn Pedersen Fox, NY, NY
2004-2005 Law Academic Plaza & Underground Library, MI, Renzo Piano Bldg. Workshop, Genoa, Italy
2003-2005 Lakeview, Spartan and Williamston High Schools - MI, Beta Design Group, Grand Rapid, MI
2003-2004 Ford Rouge Center - MI, William McDonough + Partners, Charlottesville, VR

CV

2003-2004	National Aquariums in Baltimore - MD, National Aquarium in Baltimore, Baltimore, MD
2001-2002	World of Disney Resorts Marketplace, FL & CA, Elkus Manfredi Associates, Boston, MA
2000-2004	The Hill Auditorium Renovation - MI, Kierkegaard Associates. NY, NY & Chicago, IL
2000-2002	Detroit Midfield Airports - MI, Smith Hinchman & Grylls Associates, Detroit, MI
1999-2002	World Cup 2002 Soccer Game Stadium - Kobe Japan, Obayashi, Tokyo, Japan
1998-1999	Ford Field Football Stadium-MI, Smith Group, Detroit, MI
1998-1999	Chicago Contemporary Museum of Art - IL, J.P. Kleihues Germany, AURP - UK
1998-1999	Bellagio Resort - NV, Wynn Design & Development, LV, NV
1997-1998	CY-Twombly Pavilion for the Menil Collection-TX, Renzo Piano Building Workshop, Genoa, Italy
1996-1997	Rock and Roll Hall of Fame and Museum - OH, I.M. PEI & Associates., NY, NY

UM - TCAUP - Environmental Technology (ET) Labs: The laboratory and testing facilities designed, constructed, commissioned and operated for teaching, ET-class demonstration and research.

2016	Virtual Simulation of the Vehicle Interior within the UM 3D Virtual Reality Cave
2015	Simulation of the Perceived Brightness and Loudness within the UM 3D Virtual Reality Cave
2010	Development of Portable Data Acquisition System using Manikin Head to Measure Sound/Light
2009	UM - Matthaei Botanical Garden Conservatory Fully instrumented as a Lab to Study Plant Growth
2008	UM East Medical Center Sleep and Chronophysiology Laboratory for Temporal Isolation Studies
2006	Full-Scale HVAC and Air distribution System Lab with Control along with CFD Modeling Capability,
2005	Full-Scale Vehicle with Data Acquisition System for Automatic Measuring Exterior Lighting Conditions
2004	Full-scale Double Skin Façade for Airflow and Energy Reduction Studies
2003	Full-Scale Task Lighting System & Control (3rd-floor studio) Powered by Roof's PV System
2001	Auditorium /Classroom as a Laboratory, Sound, and Light with Remote Subject Feedback
1999	Photometric and Radiometric Calibration Laboratory with a full set of special instruments,
1997	Full-Scale Photovoltaic System
1996	Automation for Real-Time Data Monitoring of Full-Scale Thermal Chamber Laboratory for Design Studies
1990	Full-scale Lighting and Daylighting Simulation Laboratory
1988	CIE - International Weather station and Sky Luminance Scanner
1987	Sky Simulator

Design and Research Projects

Virtual Reality: Measurable domain of human audio and visual perception within Virtual Environment
Lighting: UM campus exterior lighting utilizing LED as a light source

Architectural Acoustic: Acoustic Performance of Ancient Theaters - Rome Coliseum & Ostia Theater, Italy,
Application of Sound diffusion in Yost Ice Hockey Arena, Classrooms Acoustic Design Guidelines

Energy: Baseline for UM-NCRC Buildings, UM Law School, North Quad Residential Hall

International Presentations - Key Note Speaker and Invited Lectures

2018	U of Tucuman Light/Vision Center, LEED – Museum Lighting, Aug 7th, Tucuman, Argentina
2017	Chinese University of Hong Kong, Simulation Techniques in Planning.
2016	U of Rome - La Sapienza, Ministry of Cultural & Historical Heritage, June 24th, Rome, Italy
2015	U of Tucuman Light/Vision Center, October 1-2, Tucuman, Argentina
2014	U of Rome - La Sapienza, Ministry of Cultural & Historical Heritage, June 18th, Rome, Italy
2010	Osram Lighting, Daylight Simulation, May 25th, Buenos Aires, Argentina
2010	U of Tucuman Light/Vision Center, LEED - Energy Simulation, June 7th, Tucuman, Argentina
2010	U of La Rioja - Applied Science, LEED Needed Design Tools, June 8th, La Rioja, Argentina
2010	U of Mendoza - HRCS, Energy Reduction Strategies, June 9th, Mendoza, Argentina
2008	Argentina Institute of Architecture, Integrated Design, Nov 5th, Buenos Aires, Argentina
2008	Lux America, Daylight Simulation, Nov 7th, Rosario, Argentina
2007	CIE-USNC-NIST, Scotopic Sensors Calibrations, Oct 8th, Ottawa, Canada
2001	IESNA, Industrial Lighting, Aug 8th, Ottawa, Canada
1998	Chinese University of Hong Kong, Daylighting Techniques, Apr 18th, Hong Kong, Hong Kong
1998	ATTEL/Toshiba Corps, Emergency Simulation in Nuclear Power Plant ,May 15th, Tokyo, Japan

CV

- 1998 Obayashi Constructions, Daylighting Design for Soccer Fields, June 15th, Tokyo, Japan
- 1997 Architectural Engineering Department, Lighting Simulation, Nov 12th, Fukuyama, Japan
- 1997 Japan Institute of Arch, , Trends in Daylighting Design, Mar 14th, Tokyo, Japan
- 1997 JSAGA - Japan, G/Simulation as a discipline, Apr 16th, Chiba, Japan

International Presentations - Conference

- 2018 U of Rome – IEEE 2018, June 12th-15th Palermo, Italy.
- 2018 BeBeC 2018, Head Transfer Function, Feb 22nd, Berlin, Germany
- 2016 ICSV –2016, July 10th, Athens Greece.
- 2016 U of Rome – IEEE 2016, June 10th, Rome, Italy.
- 2015 U of Manchester – CIE 2015, July 3rd, Manchester, UK.
- 2015 U of Rome – IEEE 2015, June 12th, Rome, Italy.
- 2015 Simulation Techniques, Chinese University of Hong Kong, March 26th, Hong Kong, China.
- 2014 BeBeC 2012, Head Transfer Function, Feb 22nd, Berlin, Germany
- 2013 LUBEC November, 18-19, Lucca, Italy
- 2013 SPIE Optical Metrology, 13 - 16 May 2013, Munich, Germany.
- 2012 BeBeC 2010, Head Transfer Function, Feb 22nd, Berlin, Germany
- 2015 CIE, Application of Virtual Reality & Color Evaluation, July 11th, Sun City, South Africa
- 2010 BeBeC 2010, Head Transfer Function, Feb 22nd, Berlin, Germany
- 2009 CIE, Light Source for Exterior Lights, May 29th, Budapest, Hungary
- 2008 BeBeC 2008, Acoustic & Crowd Noise, Feb 22nd, Berlin, Germany
- 2008 CIE, Application of S/P Ratio, July 4th, Beijing, China
- 2008 Balkin SDR Lighting 2008, Color Perception, Oct 8th, Ljubljana, Slovenia
- 2006 EPIC/ AIVC, CFD Modeling for Comfort, Dec 12th, Leon, France
- 2005 CIE, Daylight Spectrum, May 21st, Leon, Spain
- 2005 IBPSA Double Skin Façade, Aug 12th, Ottawa, Canada
- 2003 CIE, Validation of Algorithms, July 2nd, San Diego, CA USA
- 2001 CIE, Scale Model Photometry, Oct 11th, Istanbul, Turkey
- 1997 Lux Pacifica Conference, Japan
- 1997 ISAGA Conference Tilburg, Netherland
- 1996 ISAGA Conference with Urban Planning & Gaming and Simulation, July 11th, Jurmala, Latvia

International Presentations - Workshop & Seminar

- 2018 Simulation Techniques, Chinese University of Hong Kong. (Feb and March 2017)
- 2017 Simulation Techniques, Chinese University of Hong Kong. (Feb and March 2017)
- 2016 Energy Modeling toward LEED compliance, SAPIENZA University, Rome (June 2016)
- 2015 Simulation Techniques, TCAUP & Chinese University of Hong Kong- Ann Arbor, MI (April 2015)
- 2015 Simulation Techniques, Chinese University of Hong Kong (March 2015)
- 2014 Lightfair International, Exterior Lighting Design, May 11th, Las Vegas, NV USA
- 2012 Lightfair International, Exterior Lighting Design, May 7th, Las Vegas, NV USA
- 2010 Lightfair International, Exterior Lighting Design, May 9th, Las Vegas, NV USA
- 2009 Lightfair International, Integrated Daylight Design, May 8th, NY, NY, USA
- 2008 Lightfair International, Case Studies: Daylight Design, May 5th, Las Vegas, NV USA
- 2007 Lightfair International, Daylighting Best Practices, May 6th, NY, NY, USA
- 2004 Lightfair International, Integrated Daylight Design, May 7th, Las Vegas, NV USA

National Presentations - Key Note Speaker and Invited Lectures

- 2018 IESNA, Outdoor Lighting, SALC – Smart City Lighting Oct 3rd, Tempe, Fl.
- 2016 Acoustic Society of America, May 2016, Utah, USA
- 2009 IESNA, Outdoor Lighting Challenges, Sep 15th, Philadelphia, PA
- 2008 AIA-LEED, Lighting - Continuing Education, Feb 26th, Ann Arbor, MI
- 2008 IESNA, Daylight Calculation, Oct 10th, Livonia, MI,
- 2004 CLTC-SMUD, Lighting Design Strategies, Aug 20th, Sacramento, CA
- 2002 IESNA Inspection Lighting, Aug 5th, Utah, Utah
- 2001 DTE - IES, Energy Management, Mar 14th, Detroit, MI
- 1997 ACSA, Design Tools, Aug 6th, San Fran, CA,
- 1997 DTE - IES, Energy Management, Apr 14th, Detroit, MI

CV

- 1996 SBSE, Design Tools, Aug 6th, San Fran, CA,
- 1996 IESNA, Daylight Calculation, Oct 10th, Detroit, MI
- 1996 AIA, Simulation Techniques, Dec 12th, Detroit, MI
- 1996 IESNA-DTE, Energy Management, Nov 15th, Detroit, MI

National Presentations - Conference

- 2014 ASES, TMY and TRY Weather file Validations, July 18th, San Francisco, CA>
- 2007 ASES, Integrated PV system, Aug 8th, Miami, Florida,
- 2006 EPRI/LRO, Lighting Design For Health, Feb 8th, Orlando, Florida
- 2005 ASES, Botanical Garden and Miso, Aug 8th, Tampa, Florida
- 2000 IESNA, Visual Performance, Aug 2nd, Washington, DC
- 1999 IESNA, Lighting for Plants, Aug 11th, New Orleans, USA
- 1997 IESNA, Daylighting Application, Aug 6th, Seattle, WA
- 1996 IESNA, Daylighting & Glare, Aug 5th, Cleveland, OH
- 1996 ACSA, Recreation/Simulation for Environment, Feb 7th, Honolulu, Hawaii

National Presentations - Workshop & Seminar

- 2008 AIA, Michigan, Exterior lighting and application of Induction Lamps, Feb 16th, Ann Arbor, MI,
- 2006 CLTC-SMUD-AIA, Simulation Techniques, May 9th, Sacramento, CA,
- 2000 US -NIST and CIE, Standards in lighting, Dec 11th, Washington DC, DC

UM Faculty Representative - Speaker as the Chair of the University Senate

- 2000 - 2001 Speaker for the Annual Honors Convocation, Hill Auditorium
- 2000 - 2001 Speaker Spring Commencement, UM Stadium

Professional Honors and Awards: Individual Teaching, Research, Service or Creative Activity

- 2015 Nominated and voted as one of the 2015 inductees for the Michigan Lighting Hall of Fame within Illuminating Engineering Society of North America (IESNA).
- 2015 Elected as Executive Committee Board Member for (2014- 2016).
USA / CIE (International Commission on Illumination)
- 2015 Visiting Professor: SAPIENZA University of Roma, Roma, Italy
Department Astronautical, Electrical, and Energetic Engineering (DIAEE), Roma, Italy
- 2013 Fulbright Specialist Grant in Engineering Education, J. William Fulbright Foreign Scholarship,
The Bureau of Education and Cultural Affairs of the US Department of State and the Council for
International Exchange of Scholars (CIES), Institute of International Education (IIE),
Specialist Grantee, ID #5191
- 2012 Visiting Professor: SAPIENZA University of Roma, Roma, Italy
Department Astronautical, Electrical, and Energetic Engineering (DIAEE), Roma, Italy
- 2012 Visiting Faculty/Scholar: Fraunhofer Institute of Computer Architecture and Software Technology, Berlin,
Germany.
- 2015 The 2015 University of Michigan Award of Service,
Member of the Senate Advisory Committee on University Affairs (SACUA)
- 2010 The Ocean Optics Industry National Competition Awards: Application of Spectroscopy through video and
photography as a medium. 1) Architecture Research in Lighting 2) and Application of Colorimetric within the
Virtual Environment - UM-3D Lab. - CAVE
- 2006 The 2006 TCAUP- Dean's Faculty Award of Service
- 2002 The 2002 University of Michigan Award of Service as the Chair of the Senate and
the Senate Advisory Committee on University Affairs (SACUA)
- 2000 The 2000 Fellow Award: Fellow Member of the Illuminating Engineering Society of North America.
Lighting Design ", MI, USA.
- 1999 The 1999 IESNA Design Award, EPRI-Award of Merit "The Paint and Finesse Inspection Deck for Chrysler
Assembly Plant ", Newark, NJ, USA.
- 1997 The Energy Power Research Institute (EPRI) Award, as part of the International Illumination Design Award IIDA
1997 IESNA International Illumination Design Award, EPRI-Award of Merit "The World of Disney, the New

CV

- Village Marketplace", FL, USA. Architectural Practice Project - Consultant: Daylighting System and Energy Reduction Strategies.
- 1994 The 1994 IES Michigan Illumination Design Award Hatcher Graduate Library Reading Room Retrofit at University of Michigan, USA.
- 1994 The 1994 IESNA International Illumination Design Award, "Edwin F. Guth Memorial Award of Merit for lighting design of Chrysler Technology Center, Lighting Control System of Atrium Buildings, MI, USA.
- 1993 The 1993 IESNA International Illumination Design Award "Edwin F. Guth Memorial Award of Distinction for lighting design of Chrysler Technology Center, Styling Dome", Michigan, USA.
- 1992 The 1992 General Electric, Edison Design Award for lighting design of Chrysler Technology Center, Lighting System of Styling Dome, Michigan, USA.
- 1991 The 25th Annual Paper Award from the IEEE- 1991, "Strategies to Reduce the Electrical Consumption in Institutional Building Annual Conference, Detroit, MI, USA.
- 1989 The 1989 IESNA International Illumination Design Award Edwin F. Guth Memorial Award of Distinction for Daylighting design of 1988 Olympic Speed Skating Oval in Calgary, Alberta, Canada.
- 1988 The 14th Annual Paper Award from the Solar Energy Society of Canada, "1988 Best Paper of the Year Award on the Technical and Commercial Development in Energy Efficiency and Renewable Energy", Calgary, Alberta, Canada.
- 1988 AIA Educational Honors Program - The 1988 AIA Citation of Honors for development of an architecture course "Technology Research for Design" at The University of Michigan, College of Architecture and Urban Planning, USA.
- 1988 National Lighting Awards Program - 1988 Awards for Daylighting Design Applications in Institutional Buildings, USA.
- 1985 The 32nd Annual Award from P/A, Progressive Architecture: Applied Research Award for 1985; Project Principal Scientist for the Design and Development of Daylighting Simulation Facility at Lawrence Berkeley National Laboratory (LBNL), USA.

Professional Honors and Awards: Team Member of the Awarded Project

- 2015 People Choice Award for Application of Integrated Method in Sound Visualization, A supervised dissertation research by Utami Sentagi, Ph.D. Cyber Infrastructure sponsored by The UM Office of Research Cyber Infrastructure, the office of, Associate Vice-President for Research Cyber Infrastructure.
- 2010 Award of Honor for the supervision of the dissertation research, Ph.D. thesis by the National Research Council of Thailand (NRCT) - 2010. Title: Architectural and HVAC Applications of Impinging Jet Ventilation using Full Scale and CFD Simulation by Jatuwat Varodompon, Ph.D.
- 2008 Project: Al Hamra Tower, Kuwait City, Kuwait, 2008 Chicago Athenaeum - American Architecture & International Architecture Awards, 2008-MIPIM/Architectural Review & Future Project Award for Overall & Tall Buildings; 2007 Project Awards-Miami Architectural Bienal-Bronze Unbuilt Project, Project Architect: Skidmore, Owings & Merrill, LLP. The contribution was within the limits of the Architectural Collaborative Design Team Work in CFD modeling on various design concepts. Contacts: Mr. Mark Igou, Associate Partner & Senior Technical Coordinator & Aybars Asci, Senior Designer in London- Feb. 2006.
- 2007 Project: China National Offshore Oil Corporation - CNOOC Headquarters: Beijing, China, HKIA Architecture Merit Award and Sustainability in Design Award 2007, Project Architect: KPF, NY, NY. Contribution: Architectural Practice Project - Consultant: Daylighting System and Atrium Lighting Design.
- 2007 Project: Biomedical Science Research Building (BSRB), The University of Michigan + Polshek Partnership Architects received the 2007 Institute Honor Award for Architecture from the American Institute of Architects (AIA) Project Architect: Polshek Partnership. Contribution: Architectural Research Project: Double Skin Facade as Daylighting System, plus Full Mock up Testing to Provide Energy Reduction Strategies for Office Section of the Building, Airflow, and CFD modeling.
- 2007 Project: Project Eli and Edythe L. Broad Institute of MIT & Harvard, Client: MIT, the Laboratory of the Year - 2007, High Honors by R & D Magazine, Project Architect: Elkus Manfredi, Boston, MA

CV

Contribution: Architectural Practice Project - Consultant: Daylighting / Shading & Glazing Systems Design.

2007 Project: Ford Field Stadium. The Architect of Record, Smith Group, AIA Detroit Chapter - The Michigan American Institute of Architects Award, April 20, Contribution: Architectural Practice Project - Consultant: Daylighting design and lighting systems for plant growth.

2005 Project: Lakeview High School, Battle Creek, MI, The 2005 Design Award, American School & University Magazine., Project Architect: BETA Design, Grand Rapids, MI. Architectural Practice Project -Consultant: Daylighting System and Energy Reduction Strategies.

2003 Project: Ford Rouge Center, Award in Sustainable Design by AIA Michigan, Architect: William McDonough + Partners, Superior Achievement in Design and Innovation, 2001 Retail Traffic Magazine, Gold Nugget Award of Merit. Architectural Practice Project - Consultant: Daylighting System using Large Scale Skylights and Energy Reduction Strategies.

2002 Project: Walt, Disney Imagineering, Downtown Disney, Disneyland Anaheim, California, Project Architect: Elkus Manfredi, Boston, MA, The California Building Industry 2002 Award, Architectural Practice Project - Consultant: Daylighting/Lighting & Control, Glazing, and Glare.

1996 Project: Rock and Roll Hall of Fame + Museum, Cleveland, Ohio, Completed 1995, The 1998 New York Association of Consulting Engineers: Engineering Excellence Award, 1997 American Institute of Architects Award for Innovative Design and Excellence in Architecture., Project Architect: I.M. Pei, NY, NY. Contribution in 1996 -Architectural Practice Project -Consultant on the Daylighting, Lighting Control & Glazing Systems including glare studies.

Professional Affiliation

Technical Societies

1. A fellow member of the Illuminating Engineering Society of North America (**IESNA**),
2. **Past Chair of** Technical Committees (TC) within CIE Division 6 of The International Commission on Illumination **CIE-TC- 42.6**
The Lighting Aspect for Plant Growth in Controlled Environment

Past Member of the

CIE-TC3-35 International daylight and Solar Research measuring Station

Past Chair of the

- CIE-TC3-11, Daylighting Calculation,
CIE-TC3.19, Scale Model Photometry
CIE-TC3.32, Application of Extra-Terrestrial & Solar Constant
3. Current Member of the (IESNA), Daylighting Committee
RP-05, Daylighting Design Practice Guide and contributor to the
LM-50, Exterior Lighting Design Practice Guide.
 4. Member of the Society of Building Science Educator (**SBSE**)
 5. Member of the Association of Collegiate Schools of Architecture (**ACSA**)

International Advisory Board Member of

1. The Lighting Research and Technology Journal
2. The BUILT; International Journal of Green Buildings, Thailand.

Reviewer for the following Journals

1. Journal of Lighting Research & Technology, (LRT), www.LRT.org
2. Journal of Illuminating Engineering Society of North America, LEUKOS
3. Journal of Green Building, www.collegepublishing.us
4. Journal of Energy & Building.
5. Journal of Energy & Environment.

CV

International Collaboration

- 2014-Present Dr. Sébastien BARRÉ Gfai tech GmbH, Acoustic camera Akustische Kamera,, Rudower Chaussee 30, 12489 Berlin, Germany, Phone: +49 30 6392 -1624, Fax: +49 30 6392 -1630,
E-mail: **Sébastien Barré** <barre@gfai.de>, <http://www.acoustic-camera.com>, <http://www.gfai.de>
- 2014-Present **Prof. Jin Yeu Tsou**, Center for Housing Innovations
Room 507, Esther Lee Building, the Chinese University of Hong Kong
Tel: +852 2994 0495, Fax: +852 2603 6515, Prof. TSOU (jinyeutsou@cuhk.edu.hk)
- 2010-Present **Prof. /Dr. Fabio Bisegna**, Faculty of Architecture SAPIENZA University - Rome
Dept Astronautical, Electrical and Energetic Engineering, Rome, **Italy**
Subject: Acoustic Studies of Ancient Theaters. E-mail: fabio.bisegna@uniroma1.it
- 2007- Present **Gunnar Heilmann, Dipl. Wi, Ing.**, GFAI - Tech GmbH, International Development
Rudower Chaussee 30, 12489 Berlin, **Germany**. Subject: Application of Beamforming Techniques
in Room Acoustic, E-mail: heilmann@gfatech.de.
- 2008- 2016 **Prof. Dr. Eng., Carlos Kirschbaum**, Director of the Post Graduate, Head of the Dept. of School
Light and Vision, National University of Tucuman, Tucuman, **Argentina**
E-mail: "Carlos Kirschbaum" <ckirschbaum@arnet.com.ar>, Subject: Light & Vision
Dra. Elisa M. Colombo, Directora, E: "Elisa Colombo" <ecolombo@herrera.unt.edu.ar>
Dr. /Prof. Leonardo Assaf, E-mail: "Leonardo Assaf" <lassaf@herrera.unt.edu.ar>
Dr. Raul Ajmat, E-mail: Raul Ajmat <rfajmat@hotmail.com>, Subject: Energy & Light
- 2010- 2016 **Prof. Hayato Hosobuchi, Dr. Eng.**, Department of Architecture, Aichi Institute of Technology
1247 Yachigusa, Yakusa Cho, Toyota City, 470-0392, Japan
Tel: Intl+81+565-48-8121 Ext.270, Fax: Intl+81+565-48-0277, E-Mail: hhos@aitech.ac.jp
- 2000-2011 **Dr. Eng. Professor Yoshiaki UETANI**, *Department of Urban and Environmental Engineering,
Kyoto University, Graduate School of Engineering, Kyoto, **Japan**, **Yoshi passed away 2016**
Subject: Color of Light, Email: yoshi.uetani@archi.kyoto-u.ac.jp

Visiting Scholars

- 2009-2010 **Dr. Hayato HOSOBUCHI** came to the USA and worked along with me as a visiting scholar
Post- doctoral research on energy use modeling; Dr. Hayato HOSOBUCHI received a postdoctoral
grant award from the Education Unit for Global Leaders in Advanced Engineering
Sciences in Kyoto University. UM visit dates (090109 to 022810).
- 1998-1999 **Dr. T. Chritova** from Moscow University, Russia, as part of the professional certificate program in
Gaming and Simulation
- 1996-1997 **Dr. M. Valens** from Tilburg University, Netherlands, as part of the Professional Certificate
Program in Gaming and Simulation

International News:

- 2010 "**La Caceta**" - **Tucuman Argentina**" Research on Energy Efficiency Design" and
May 28th "Argentina Association of the Lighting Designers, "Daylighting Design"
<http://www.unlar.edu.ar/index.php/humanidades> - June 12th
- 2002 Misaki Kobe-City Stadium, World Cup 2002, Annual Report by Obayashi Inc., Japan, Page 12

Architectural & Research Projects within the News (selected)

- 2018 New York Times, <https://www.nytimes.com/2018/12/03/upshot/why-hospitals-should-let-you-sleep.html>
Why Hospitals Should Let You Sleep
- 2015 Health Care Facilities magazine, which appears to be affiliated with the American Hospital Association,
published the noise reduction story online. They pretty much used the press release verbatim -- saves time!
http://www.hfmmagazine.com/display/HFM-news-university-of-Michigan-cuts-noise-in-hospital&utm_source=twitter&utm_medium=social&utm_campaign=HFM

CV

- 2012 **Michigan Engineering Lab Log** - spring - News, "Architecture Research in the Virtual Reality", UM3D Lab for visualization & auralization of sound in the Computer Assisted Virtual Environment - <http://lablog.engin.umich.edu/2010/10/why-does-interior-designer-favor-one.html>
- 2010 **The Ocean Optic** Industry National Competition Awards: <http://www.oceanphotochallenge.com/> www.dailymotion.com/.../xjkvya_ocean-optics-video-and-photo-challen - June 28, 2010
- 2009 **Detroit Public Television (WTVS 56)**. The work with the DSH was included in a new TV program which was aired on April 5th, 2:30 PM, An episode that was devoted to Orchestra Hall, its history, the 2003 renovation and expansion, and its acoustic quality. TV program titled "Making Music with the Detroit Symphony Orchestra (DSO)"
- 2009 **The Ann Arbor News** May 26, 2008 14:00PM , Full Spectrum Solutions set to open 'green building' in fall, by Chris Gaultz | Jackson Citizen Patriot , Tuesday March 17, 2009, 6:30 AM, New Buhr Park light powered by wind and solar energy, Posted by Amanda Hamon <http://www.wwj.com/Ann-Arbor-Tries-Out-Solar--Wind-Street-Light/2102890>.
- 2009 **Mlive.com – Jackson News**, Design and construction of a light industrial building as part of the research work within the sustainable design research laboratory, http://www.mlive.com/news/jackson/index.ssf/2009/03/full_spectrum_solutions_set_to.html.
- 2008 **MMVIII WWJ Radio**, May 29th, UM Opens New Sleep Research Center, One of the world's first laboratories devoted solely to research on how sleep and biological rhythms influence depression, substance abuse and other aspects of mental well-being has opened at the University of Michigan Health System.
- 2008 **Ann Arbor News, Connection**, May 26th, Science Section, Sci-Fi Street Light

Society of Building Science Educator News

- 2011 Summer – "Sound within the Roman Coliseum", Research collaboration with the SAPIENZA University - Rome, Italy & GFAI - Tech GmbH, International Berlin, Germany.
- 2011 Spring – "Plants as Meters in Building Commissioning", Research collaboration with the School of Natural resource and environment within Matthaei Botanical Garden results on the Plant growth under different lighting and climatic conditions.
- 2010 Fall - News, The research on the measureable domain for sound and light within the Computer Assisted Virtual Environment (CAVE) - UM 3D Lab.
- 2009 Fall - News on the newly designed Sleep and Chronophysiology Laboratory as part of the Research within Sustainable Design Research Laboratory at TCAUP and collaboration with East medical center - Depression Center and Sleep Laboratory.
- 2008 Fall - News on the application of the green design and strategies for two LEED projects as part of the Research within Sustainable Design Research Laboratory at TCAUP.
- 2008 Summer - News on the "Carbon Natural Street Lights" - a newly developed Solar and Wind Powered exterior lighting system utilizing Induction light source, and installed at the City Ann Arbor's Buhr Park.
- 2007 Winter, News "A Louder Big House"- Research on the acoustic performance of the newly designed UM sky Boxes- Using Beam Forming Techniques in Acoustic"
- 2007 Spring, News "SAD Lights for Happy Winters"- Research on the application of newly developed lights for changing the Circadian Rhythm of the student working within the TCAUP studios" and news on the newly developed Solar Powered exterior lighting system utilizing LED source.
- 2006 Spring - News "Simulation techniques on light pollution and airflow distribution using computational fluid dynamics for measuring environmental performance evaluation"

U of M Record News

- 2010 Spring - News on the application of the UM 3D Lab for visualization and auralization of sound within the Computer Assisted Virtual Environment (CAVE)
- 2008 UM – Medical News - Design and construction, Commissioning of the Temporal Isolation laboratory for East Medical Center- Depression Center, <http://www.depressioncenter.org/news/080529-sleeplab.asp>
- 2007 Biomedical Science Research Building (BSRB) receives national nod By Diane Brown Facilities and Operations, The University, and Polshek Partnership Architects have received the 2007 Institute Honor

CV

- Award for Architecture from the American Institute of Architects (AIA) for the (BSRB) Updated 4:00 PM January 24, 2007- http://ur.umich.edu/0607/Jan22_07/07.shtml.
- 2005 UM Solar House Shines in Washington, D.C., Solar Decathlon, Sponsored by the Department of Energy.

U of M Michigan Daily News

- 2007 A louder Big House by Elaine Lafay for the Daily, Published November 1
2007 Sound Science by Nick Streicher for the Daily, published April 11

Portico Publication by TCAUP

- 2008 Fall - Acoustic Performance of the newly designed Sky Boxes within the University of Michigan Football Stadium, and its geometric impact on the amplification of the crowd noise and its contribution to the mitigation of noise within the surrounding neighborhood.
- 2008 Spring - Sustainable Design Research Laboratory Research reports on the Green Roof for A3C Architect in Anna Arbor and the Industrial Factory - "Well Worth" building for Full Spectrum Solution Inc. designed and built in Jackson County MI
- 2006 Winter - Building Indoor Environment that Makes Sense (s)- Enhance Spectrum Lighting Research Laboratory , Light, Sound and Airflow Simulation.
- 2005 Winter- Breathing for Buildings - Measure many times and build once: Design of the Double Skin Façade for the Biological Science Research Building" BSRB, Natural Ventilation & air flow for Hill Auditorium Displacement Ventilation.
- 2005 Fall - How we look at the light, finding the balance between light and dark at UM
News o the application of the latest research findings for UM campus exterior lighting systems.

WEB links to recent research collaborations and publications

New UM Lab and research activities,

The project page for "Virtual Reality as a Surrogate Sensory Environment":
<http://um3d.dc.umich.edu/portfolio/virtual-reality-as-a-surrogate-sensory-environment/>
A direct link to the published version at Springer Link:
http://link.springer.com/chapter/10.1007%2F978-3-642-23363-0_11

Scuola Grande: Virtual Tour

<http://www.scuolagrandesanrocco.it/en/buildings/scuola-grande/virtual-tour.html>
<http://www.scuolagrandesanrocco.it/en/news.html>

Environmental analysis of the Scuola

The Statute of the "Scuola Grande Arciconfraternita di San Rocco" stipulates that the primary task of the association is the "...care and upkeep of the outstanding works of art..." For this reason, collaboration with the Universities of Rome "Sapienza" and of Michigan in the USA has been initiated by the Chancellor. In the first instance, this involves scientific analysis being undertaken concerning the current situation regarding the microclimate, lighting, and acoustics in all the rooms, halls and galleries of the "Scuola"

Mojtaba Navvab, Ph.D., FIES

Taubman College of Architecture and Urban Planning
The University of Michigan, Arch Bldg., Rm-1205D,
2000 Bonisteel Blvd., Ann Arbor, MI 48109-2069
E-mail: moji@umich.edu, Voice:(734)936-0228
https://www.researchgate.net/profile/Mojtaba_Navvab