SOURAV BANERJEE Ph.D., P.E., Fellow-ASME

CURRICULUM VITAE

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Articles on Prof. Banerjee

Tangible Math - August 4, 2017
Material Whisperer - June 14, 2019
SHM Person of the Year 2019 - October 29, 2019
AR-VR in Online Teaching - April 6, 2020

Education

- **Ph.D.,** Department of Engineering Mechanics**, University of Arizona,** Tucson, August [illegible].
  Major: ***Engineering Mechanics****;* Minor: ***Applied Mathematics***

- **M.Tech.** Indian Institute of Technology (**IIT**), Bombay, India, March 2002.
  Institute of Static and Dynamics of Aerospace Structures (**ISD**), University of Stuttgart, Germany,
  Major: ***Structural Engineering***

- **B.E.,** Bachelor of Civil Engineering, Indian Institute of Engineering Science and Technology (**IIEST**), formerly known as Bengal Engineering College (D.U.), West Bengal, India, May 2000.

Research: Themes

1. **Computational Acoustics and Ultrasonics:** computational nondestructive evaluation (NDE) & structural health monitoring (SHM). physics based predictive modeling of acoustics & ultrasonic waves in solids, fluids, composites, nuclear & engineered metamaterials, impact mitigation and wave suppression.
2. **Material State Awareness for SHM**: composites damage precursors; predictive material degradation; progressive damage assessment at multiple scales; experimental NDE and SHM
3. **System Identification:** Signal Processing; Big-Data analytics; Surrogate modeling of complex systems
4. **Metamaterials, Mechatronics and Robotics**: smart materials and sensing technologies; robotic hearing, acoustic/ultrasonic energy harvesting; ultrasonic wave guiding/ tunneling/ lensing, topological structure,
5. **AcoustoBiomechanics, Bio-Origami & Programmable Matter**: exploring the physics of acoustics in nature to device new devices / sensors; metamaterial applications; computationally predict the complex dynamics of bioorganisms.

In-house Research tools

1. Quantitative Acoustic Contrast Tomography (Q-ACT) - Experimental
2. Quantitative Ultrasonic Image Correlation (QUIC) - Experimental
3. Distributed Point Source Method (DPSM-SISMAG – Wave-FILM) – Computational
4. Peri-elastodynamic Simulation Approach (PESA) - Computational
5. Finite Spectral Element Method (FSEM) – Computational
6. Inverse Digital and Computational Analysis Terminal (INDICATE) – Big-Data Processing, ZIGNAL

Honors and Awards

- 2022-2023: **ONR Sabbatical Program Award,** working at NAVSEA Carderock, MD
- 2021, 2022: **ONR Summer Research Faculty Award**, ONR, NAVSEA, Carderock, MD
- 2020: **Outstanding Paper Award** by ASME Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems

- 2020: **NASA Group Achievement Award**: A team member of Advanced Composite Program (ACP- 2015-2019)
- 2020: Become an **ASME Fellow**, Honored by American Society of Mechanical Engineers.
- 2020: Honored as a leading faculty to ease the online teaching at UofSC. President of UofSC visited the virtual class to recognize his effort. Pls refer the article AR-VR in Online Teaching.
- 2020: Invited for Graduate Seminar, Civil Engineering and Engineering Mechanics Department, University of Arizona, Tucson,
- 2019: ***Structural Health Monitoring Person of the Year Award***, by Structural Health Monitoring: An International Journal. An Article on Dr. Banerjee's award
- 2019: ***Breakthrough Star Award***: Prestigious highest research award to a young faculty by USC Office of Vice President of Research, University of South Carolina, Februray 2019 An Article on Dr. Banerjee's Research
- 2019: Invited for a Technical Expert Talk, Aerospace Engineering Department, Indian Institute of Technology, Kharagpur, India
- 2019: ***Banerjee's student Ms. Fariha Mir, received Outstanding Master Thesis award***, honored by University of South Carolina, Graduate School.
- 2018: ***Banerjee's student Mr. Sajan Shrestha, received Outstanding Master Thesis award***, honored by University of South Carolina, Graduate School.
- 2018: ***Invited Author***: Advanced Composite Program Handbook on NDE of Composite, NASA
- 2018: ***Invited Guest Lecture***: R&D division, TATA Steel, Jamshedpur, India, Jan 9th 2018.
- 2017: ***Michael J. Mungo Teaching Award***: Prestigious highest teaching award at University of South Carolina, by the Office of Provost, University of South Carolina, May 2017. An Article on Dr. Banerjee's teaching
- 2016: **Editorial Board Member: Scientific Reports** published by Nature Publishing Group. Since 2016
- 2016: **Invited Speaker**: IEEE CMMI conference at Jadavpur University, Kolkata 700047
- 2015: **ASPIRE** Award grant by the Office of Vice President of Research, University of South Carolina
- 2014: **Invited Guest Lecturer**: Industry workshop on SHM of Composites at Skolkovo technological Institute (Skoltech), Moscow, Russia, Dec 8th – Dec 12th
- 2014: **Invited Speaker**: 29th American Society of Composites, Annual Technical Conference, University of California, San Diego, Special Session on NDE and SHM of Composites
- 2013: Who is Who in America
- 2012: **Invited Speaker**: 164th ASA Meeting, Kansas City, Missouri, USA, Special Session 2pSA
- 2010: **Achenbach Medal** to recognize the outstanding contribution as a young researcher in the field of structural health monitoring, Sponsored by Embraer, Given at IWSHM 2011
- 2009: **Best Practical SHM Solution** in Aerospace awarded by Airbus at IWSHM 2009
- 2008: **Professional Engineers** (PE) License, Since 2008
- 2007: **Invited speaker** Sponsored by NSF to present contemporary research in "World Forum on Smart Materials and Smart Structures Technology", Chonjqing & Nanjing, China"
- 2007: Invited as a leading author to write a technical article on contemporary research in "Industrial Sensing and Measurement" column of Optical Engineering Magazine, SPIE Newsroom
- 2006: Honored as a **Technical Expert**, by Department of Engineering Mechanics, University of Arizona, Tucson.
- 2004: Visiting research scholar to IIT Bombay, Awarded by University of Arizona, National Science Foundation (NSF)

- 2002: ***National Award for one of the best M.Tech Thesis***, Honored by Indian Society of Technical Education (ISTE)
- 2002: ***Jaya Seetha Ranjani Harihar Subramani Award***, for being outstanding graduate student. Honored by Indian Institute of Technology (IIT) Bombay
- 2001: **DAAD Scholar**, Honored by German Academic Exchange Program Service, German

Positions and Employments

Year	Institution	Position
2018-present	University of South Carolina	Associate Professor (Tenured)
2012-2017	University of South Carolina	Assistant Professor
2009-2011	Acellent Technologies Inc.	Director of Product Development
2008-2009	Acellent Technologies Inc.	Senior Project Engineer
2008-2008	Arizona State University	Research Assistant Professor
2005-2008	University of Arizona	Technical Expert (Part time)
2006-2007	Consulting Engineers Corporation	Project Engineer, Structure
2005-2006	AMEC, Earth and Environment	Staff Professional, NDE Engineer

Awards and Funding - Present to old

Sponsor	Project Title	Role	Years Funded
ONR	Digital NDE Twin Application for Ship Hulls	SRF PI	2021
NASA	SBIR Phase I: Ultrasonic Energy Interaction with Composite Damage in Both Frequency and Time Domains, Subcontract by Advent Innovation.	PI	2021
SCDA	Application of robotics in vegetable harvesting	PI	2020-2021
NASA	HiCAM Assess SAO NDE for Hi-rate Manufacturing	PI	2021-2026
SCDA	AI Driven Robotic Planting	PI	2021-2022
SCDA	Fully Automated Ultrasonic Detection and Robotic Removal of Bones & Foreign Materials from Ground Poultry and Rendered Products	PI	2019-2021
NASA	Damage Detection using Two Stage Compressive Sensing (Phase I & II)	PI	2019-2022

U.S. DEPARTMENT OF ENERGY	PVDF-film for Robust Online Assessment of Composite Tanks (PROACT)	**PI**	2019-2020
NASA ACP	Composite bond line Inspection through Ultrasonics and Bond Quality Index	**PI** of the Task 7 / Co-**PI**- TC21	2017-2020
USDA*	TOXIMAP: Computational Framework for Prediction of Geographical and Temporal Incidence of Mycotoxins in US Crop Fields	Co-PI	2017-2021
NRCS, UDSA*	Demonstration of model using cover crops to improve soil health and reduce crop stress and aflatoxin contamination	Co-PI	2016-2018
NASA LaRC*	Multiscale Computational NDE and SHM for Composites	**PI**	2015-2018
Boeing Co.*	Nondestructive evaluation of Composite Project 1: Energy Harvesting using Acoustoelastic Metamaterials for SHM Project 3: Physics based model of wave composite interaction Project 4: Angle beam ultrasonic for wrinkle inspection in composites	*Bucket Co-director* **PI** **PI** **PI**	2016-2019
ARL SBIR Phase I *	Explaining to Damage State in Composites at Multiple Length Scale using Quantitative Ultrasonic and SEM	**PI**	2015-2016
ASPIRE I, USC*	"Is it possible to Quantify the Growth of Entropy due to Material Damage?"	**PI**	2015-2016
NASA SC SGC Office*	"A novel computational method for nondestructive evaluation of space composite" (Palmetto Academy Program)	**PI**	2015
SPARC program USC/VPR*	Graduate Research: "Autonomous energy scavenging from low frequency ambient noise using Acoustoelastic Metamaterials (AEMM)"	**PI**	2015-2016
Magellan USC*	UG Research: "Development of broad band mechanical energy harvester using cochlea mechanics"	Mentor	2015
NCI/NIH*	"Center for Colon Cancer Research: Mechanical landscaping of a colon tissue with customized gut microflora (pilot project)"	Co-PI	2014-2015
ASPIRE II, USC*	"Uncertainty quantification driven multi-scale model development for aflatoxin prediction"	Co-PI	2014-2015

SkolTech, Russia* Skoltech Skolkovo Institute of Science and Technology	Advanced Structures, Processes and Engineered Materials (ASPEM), **Project 1.2:** Predictive Multi-scale Quantification of Precursor to Damage State in Composites	Co-PI **PI** for the Project 1.2	2014-2015
AFOSR	Development of CSLAN for real time monitoring of F-15 aircraft components	**PI**	2009-2010
AFOSR	Development of CSLAN for real time monitoring of F-15 aircraft components: Phase II	**PI**	2010-2012
ONR	Development of SMART HULL system for Naval Structures	**PI**	2011-2011
EADS, Germany EMBRAER	Development of on-board SHM system for full-composite Unmanned Air Vehicles	**PI**	2010-2011
AIRBUS AIRBUS	Development of predictive model to classify disbond and delamination in Composite Structures	Co-PI	2010-2011
Thales Alenia, Italy ThalesAlenia Space	Structural Health Monitoring System for Composite Propellant Tank used in space applications	**PI**	2010
NIST NIST National Institute of Standards and Technology U.S. Department of Commerce	Development of SCANSn System for Infrastructure health management. PI: Dr. Shawn Beard	Co-PI	2008-2012

Professional Services for Broader Scientific Community

Professional Societies

- Served as a Secretary, and currently, Executive Committee member of the NDE division of ASME
- Serving as a Chair of the Ultrasonic Technical Committee (TC) of the NDE division of ASME.
- Serving as a member, SHM of Aerospace Structures TC of SMASIS, ASME
- Member since 2008, The American Society of Mechanical Engineers (ASME)

Conferences

- **Special Session Organizer**, QNDE **2020**, Organized by ASME NDPD division, Minneapolis, MN
- **Symposium Organizer**, Conference wide Symposium on NDE, ASME IMECE **2019**, Salt Lake City, UT
- **Symposium Organizer**, Conference wide Symposium on NDE, ASME IMECE **2018**, Pittsburg, PA
- **Track Organizer**, Track 17- NDE, Diagnosis and Prognosis, ASME IMECE **2017**, Tampa, FL
- **Track Organizer**, Track 17- NDE, Diagnosis and Prognosis, ASME IMECE **2016**, Phoenix, AZ
- **Topic Organizer**, Track 2, Topic 17, Ultrasonic Manufacturing, ASME IMECE, 2015, Huston, TX
- **Committee Member**, Session Chair, SPIE NDE & Smart Structure Conference, **2008-2016**
- **Session Organizer and Chair**, 51st Society of Engineering Science (SES) Meeting, Purdue, **2014**
- **Session Organizer and Chair**, Special Session: Precursor to damage quantification, IWSHM **2013**.
- **Session Organizer and Chair**, 50st Society of Engineering Science (SES) Meeting, Brown, **2013**
- **Session Chair**, ASME SMASIS, **2011**

Journals and Publishers

- **Editorial Board Member**, Journal of Composite Science, MDPI Publication, 2020-present
- **Advisory Board Member**, *ASME Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems, 2019-present*
- **Editorial Board Member**, Scientific Reports, Nature Publishing Group, 2016-present
- **Editorial Board Member**, International Aeronautics Journal
- **Editorial Board Member**, International Journal of Aeronautics and Aerospace Engineering
- **Book Reviewer**: Springer, CRC Press, Cambridge University Press,
- **Reviewer** to more than **~52** National and International Journals including Nature publishing Group

Patents

Approved / Pending / Disclosed

P1. **Banerjee**, S., Qing, X., Beard, S., Chang, F., "*Method and Apparatus for Estimating Damage in a Structure*", US Patent No. 8521444, Approved on August 2013.

P2. **Banerjee**, S., Chnada, A., "*Quantitative Acoustic Contrast Tomography (Q-ACT) for studying fungal growth and toxicity*", US Patent No. 9670522, Approved on June 6, 2017.

P3. **Banerjee**, S., Ahmed, R., "*Power Optimization for a Unit Cell Metamaterial Energy Harvester* ", US Patent No. 10694466, Approved on June 23, 2020.

P4. **Banerjee**, S., Saadatzi, MdS., "Artificial Cochlea for Mechanical Processing of Sound", UofSC Patent File No. 1491

P5. Saadatzi, MdS., **Banerjee**, S., "High Voltage Energy Harvesting and Sensing with 3D Spiral Design", UofSC Patent File No. 1488

Books / Chapters

Published / In Press / Writing

B1. **Banerjee**, S., Metamaterials for Topological Acoustics and Energy Harvesting, CRC Press Taylor and Francis Group, Contract Signed, TBP 2023.

B2. **Banerjee,** S., Leckey, C., A Handbook of Computational Nondestructive Evaluation, CRC Press Taylor and Francis Group, May 28, 2020, ISBN 9781138314542.

B3. **Banerjee,** S., Patra S., Chapter 15 Multiscale Quantification of Damage Precursors, Nonlinear Acoustic Techniques for Nondestructive Evaluation**,** Acoustical Society of America. ISBN 978-3-319-94474-6, 2018

B4. **Banerjee,** S., Shrestha, S., "Numerical Modeling of Wave Propagation in Composites", Structural Health Monitoring for Advanced Composite Structures, World Scientific. ISBN 978-1-78634-392-5, 2018

B5. **Banerjee**, S., Kundu, T., Chapter 4 "Advanced Application of Distributed Point Source Method - Ultrasonic Field Modeling in Solid media". Ed. T. Kundu and D. Placko, *John & Willey Publication,* Hoboken, New Jersey, USA, ISBN: 978-0-471-73314-0 (Lib. CAT# TA347.D57P585)*,* 2007.

Magazine Articles

Published / In Press / Writing

M1. **Banerjee**, S., Kundu, T., "Modeling of Ultrasonic Wave-scattering by Internal Anomalies for NDE/SHM Application.", Column - Industrial Sensing and Measurement, SPIE News Room, Optical Engineering Magazine **(2007)**.

Journal Publications

Published / In Press / Accepted / Submitted

2022

J1. Akter, K., Ahmed, H., **Banerjee**, S., Anisotropic guided wave in isotropic metaplate with orthogonal perturbation, International Journal of Solids and Structures, 254, 111922, 2022.

J2. Indaleeb, M.M., Ahmed, H., **Banerjee**, S., Acoustic Computing: At tunable pseudospin-1 Hermitian Dirac-like cone, Journal of Acoustical Society of America, 152(3), pp. 1449-1462, 2022.

J3. Mandal, D., Indaleeb, M.M., Younan, A., **Banerjee**, S., Piezoelectric point-of-care biosensor for the detection of SARS-COV-2 (COVID-19) antibodies, Sensing and Bio-Sensing Research, 37, 100510, 2022.

J4. Mandal, D., **Banerjee**, S., Surface Acoustic Wave (SAW) Sensors: Physics, Materials, and Applications, **Sensors**, Vol. 22(3), 820, 2022.

J5. Tavaf, V., **Banerjee**, S., Effect of Defects Part I: Degradation of Constitutive Coefficients as an input to the Composite Failure Model with Micro voids and Porosity, **Journal of Composite Science**, Vol.. 6 (2), 37. 2022.

2021

J6. Indaleeb, M. M., **Banerjee**, S., Simultaneous Dirac-like Cones at Two energy states in Tunable Phononic Crystals: An Analytical and Numerical Study., **Crystals**, 11 (12), 1528, 2021

J7. Ahmed, H., Ghosh, S., Sain, T., **Banerjee**, S., Hybrid Bessel beam and metamaterial lenses for deep laparoscopic nondestructive evaluation. **Journal of Applied Physics**, 129(6) 165107, 2021.

J8. Tavaf, V., Saadatzi, M., **Banerjee**, S., Effect of Defect II: Multiscale Effect of Microvoids, Orientation of Rivet Holes on the Damage Propagation, and Ultimate Failure Strength of Composites, **Journal of Composite Science**, 5(4), 112. 2021

J9. Sultana, Q. N., Khan, M., Mahamud, R., Saadatzi, M., Sultana, P., Farouk, T., Quirino, R., **Banerjee**, S., Fabrication and Characterization of Non-Equilibrium Plasma-Treated PVDF Nanofiber Membrane-Based **Sensors**, Vol. 21(12), 4179, 2021.

2020

J10. Ahmed, R., Ahmed, H., **Banerjee**, S., "A Numerical Approach to Investigate the Influence of Resonator Setting and Volume Fraction on Stop Bands in an Acoustic Metamaterial, **Journal of Engineering Advancement** (Accepted)

J11. Tavaf, V., **Banerjee**, S., Generalized Analytical Dispersion Equations for Guided Rayleigh-Lamb (RL) waves and Shear Horizontal (SH) waves in Corrugated Waveguides, **International Journal of Solids and Structures**, Vol 202, 1, pp.75-86, 2020.

J12. Saadatzi, MS., Saaadatzi, S, **Banerjee**, S., Modeling and Fabrication of a Piezoelectric Artificial Cochlea Electrode Array with Longitudinal Coupling, **IEEE Sensors**, Vol. 20, Issue 9, pp. 11163-11172, 2020

J13. Indaleeb, M.M., Ahmed, H., Saadatzi, MS., **Banerjee**, S., Deaf band-based prediction of Dirac Cone in acoustic metamaterials, ***Journal of Applied Physics***, Vol. 127, Issue 6, 10.1063/1.5122297, 2020 (**Featured as Editor's Pick**).

J14. Shrestha, S., Tavaf, V., **Banerjee**, S., "A Framework for Computational Nondestructive Evaluation of Degraded Composite with Microscale Defects," ***ASNT Journal of Materials Evaluation***, Vol. 78(1), pp. 104-118, 2020.

2019

J15. Patra, S., Ahmed, H., Saadatzi, MS., **Banerjee,** S., Effect of Time-Dependent Strength Recovery of Composite Materials: Quantification Through Higher Order Ultrasonic Non-Linearity Using Lamb Waves, ***ASME Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems***, Vol. 3(1): 011005, 2019.

J16. Patra, S., Ahmed, H., Saadatzi, MS., **Banerjee**, S., Experimental Verification and Validation of Nonlocal Peridyanmic Approach for Simulating Guided Lamb Wave Propagation and Damage Interaction, ***Structural Health Monitoring*** Journal, Vol 18(5-6), pp. 1789-1802.

J17. Tavaf, V., **Banerjee**, S., Quantification of degraded constitutive coefficients of composites in the presence of distributed defects, ***Journal of Composite Materials***, Vol. 53(18) 2517–2529, DOI: 10.1177/0021998319832351

J18. Indaleeb, M.M., **Banerjee**, S., Hossain A., Saadatzi, MS., Ahmed, R., Deaf band based engineered Dirac cone in a periodic acoustic metamaterial: A numerical and experimental study, ***Physical Review B***, Vol. 99, 024311; https://doi.org/10.1103/PhysRevB.99.024311.

J19. Patra, S., Hossain A., Saadatzi, MS., **Banerjee**, S., Evidence of dissipative and growing nonlinearity in Lamb waves due to respective stress-relaxation and material degradation in composites, ***Ultrasonics***, Jul 2019, Vol. 96, pp. 224-231, doi: 10.1016/j.ultras.2019.01.002.

2018

J20. Hossain A., Indaleeb M.M., Ahmed, R., **Banerjee**, S., Multifunction acoustic modulation by a multi-mode acoustic metamaterial architecture, ***Journal of Physics Communication***, Vol 2 (11), pp. 115001.

J21. Kaur, K., Saxena, A., Debnath, I., L O'Brien, J., Ajami, NJ., Auchtung, TA., Petrosino, JF., Sougiannis AJ., Depaep, S., Chumanevich, A., Gummadidala, PM., Omebeyinje, MH**., Banerjee**, S., Chatzistamou, I., Chakraborty, P., Fayad. R., Berger, F. G., Carson, JA., Chanda, A., Antibiotic-mediated bacteriome depletion in $Apc^{min/+}$ mice is associated with reduction in mucus-producing goblet cells and increased colorectal cancer, ***Cancer Medicine***, Vol. 7 (5), pp. 2003-2012, 2018

J22. Tavaf, V., Saadatzi, MS, Shrestha, S., **Banerjee**, S., Quantification of Material Degradation and its behavior of Elastodynamic Green's function for Computational Wave Field Modeling in Composites, ***Materialstoday Communications***, Vol. 17, pp. 402-412.

J23. Habib, A., Shelke, A., Amjad, U., Pietsch, U., **Banerjee**, S., Nonlocal Damage Mechanics for Quantification of Health for Piezoelectric Sensor, **Applied Sciences**, Vol. 8(9), pp. 1683.

J24. Saadatzi, MS., Mir, F., Saadatzi, M. N., **Banerjee**, S., Modeling and Fabrication of a Multi-axial Piezoelectric Energy Harvester based on a Metamaterial-inspired Structure, ***IEEE Sensors Journal***, Vol 18, No. 22, pp. 9410-9419.

J25. Saadatzi, MS., Saadatzi, M. N., Tavaf, V., **Banerjee**, S., AEVE 3D Acousto-Electrodynamic 3Dimensional Vibration Exciter for Engineering Testing, ***IEEE/ASME Transactions on Mechatronics***, Vol. 23, No. 4, pp. 1897-1906.

J26. Mir. F., Saadatzi, MS., Ahmed, R., **Banerjee**, S., (2018) Acoustoelastic Metawall Noise Barriers for Industrial Application with Simultaneous Energy Harvesting Capability, ***Applied Acoustics***, Vol 139, pp.282-292.

J27. Shrestha, S., Ahmed, R., **Banerjee**, S., (2018) Virtual Nondestructive Evaluation of Anisotropic Plates Using Symmetry Informed Sequential Mapping of Anisotropic Green's function (SISMAG), ***Ultrasonics,*** Vol 88, pp 53-61.

J28. Ahmed, R., **Banerjee**, S., (2018) An Articulated Predictive Model for Fluid-free Artificial Basilar Membrane as Broadband Frequency Sensor, ***Mechanical Systems and Signal Processing***, Vol. 100, pp. 766-781.

J29. Patra, S., Ahmed, H., **Banerjee**, S., (2018) Peri-Elastodynamic Simulations of Guided Ultrasonic Waves in Plate-Like Structure with Surface Mounted PZT, ***Sensors***, Vol. 18, No. 274, pp. 1-16.

2017

J30. Cary, JW., Harris-Coward, P., Scharfensetein, L., Mack, MM., Chang, PK., Wei, Q., Lebar, M., Carter-Wientjes, C., Majumdar, R., Mitra, C., **Banerjee**, S., Chanda, C., The Aspergillus flavus homeobox gene, hbx1, is required for development and aflatoxin production, Toxins, Vol. 9(10), 315, 2018

J31. Patra, S., **Banerjee**, S., (2017), Material State Awareness for Composites Part II: Precursor Damage Analysis and Quantification of Degraded Material Properties Using Quantitative Ultrasonic Image Correlation (QUIC), **Materials**, Vol. 10(12), pp. 1444

J32. Patra, S., **Banerjee**, S., (2017), Material State Awareness for Composites Part I: Precursor Damage Analysis Using Ultrasonic Guided Coda Wave Interferometry (CWI), **Materials**, Vol. 10(12), pp. 1436.

J33. Ahmed, R., Mir, F., **Banerjee**, S., A Review on Energy Harvesting Approaches for Renewable Energies from Ambient Vibrations & Acoustic Waves using Piezoelectricity, ***Smart Materials and Structures***, Vol 26, Number 8, (27pp).

J34. Chijioke, A., Mir, F., **Banerjee**, S., Modified 'Zener' Theory to accurately predict Impact Force History for Soft Impactors employing Spiral Sensing, ***Experimental mechanics***, 57:1435-1444.

2016

J35. Ahmed, R., **Banerjee**, S., A Sub-Wavelength Scale Acoustoelastic Sonic Crystal for Harvesting Energies at very Low Frequencies (<~1 KHz) using Controlled Geometric Configurations, ***Journal of Intelligent Material Systems and Structures***, Vol. 28(3), pp. 381-391.

J36. Lin, X., Terejanu, G., Shrestha, S., **Banerjee**, S., Chanda, A., (2016) Bayesian Model Selection Framework for Identifying Growth Patterns in Filamentous Fungi, ***Journal of Theoretical Biology***, Vol. 398, pp. 85-95.

J37. Rima, R., Chijioke, A., Chakraborty, P., **Banerjee**, S., Spiral Sensing & Probability Map of Impact (PMOI) for Impact characterization, ***International Journal of Modern Engineering***, Vol. 16 (1), pp. 56-68.

2015

J38. Patra, S., **Banerjee**, S., Terejanu, G., Chanda, A., (2015), Subsurface pressure profiling: a novel mathematical paradigm for computing colony pressures on substrate during fungal infections, ***Scientific Reports,*** **5**, 12928, (2015).

J39. Shelke, A., **Banerjee**, S., Zhenhua, T., Yu, L., (2015) "Predictive Design of Spiral Lamb Waveguide for Spatial Filtration of Frequencies in a Confined Space". ***Journal of Experimental Mechanics***, Springer, 55:1199-1209.

J40. Dongyu X, Cheng, X., **Banerjee**, S., Huang, S., (2015), Dielectric and electromechanical properties of modified cement/polymer based 1-3 connectivity piezoelectric composites containing inorganic fillers, ***Composites Science and Technology***, Vol. 114, pp. 72-78.

J41. Habib, A., Vogel, M., Shelke, A., Brand, S., Jiang, X., Kundu, T., Pietsch, U., **Banerjee**, S., (2015) Quantitative Ultrasonic Characterization of c-axis oriented polycrystalline AlN thin film for smart device application, ***Acta Austica***, *European Acoustic Association, Vol 101 (4),* DOI: 10.3813/AAA.918863.

J42. Dongyu, X., Cheng, X, **Banerjee**, S, Wang, L, Huang, S, (2015), "Dielectric, piezoelectric and damping properties of novel 2-2 piezoelectric composites", ***Smart Materials and Structures,*** **24,** 025003 (8pp), 2015, doi: 10.1088/0964-1726/24/2/025003.

J43. Dongyu, X., **Banerjee**, S, Wang, Y, Huang, S, Cheng, X., (2015), "Temperature and loading effects of embedded smart piezoelectric sensor for health monitoring of concrete structures", ***Construction and Building Materials*****, 76**, pp. 187-193.

J44. Ahmed, R., **Banerjee**, S, (2015), "Predictive Electromechanical Model for Energy Scavengers using Patterned Piezoelectric Layers", ***ASCE Journal of Engineering Mechanics****, Vol 141 (2) pp. 04014113-1-04014113-11,* 10.1061/(ASCE) EM.1943-7889.0000829, 04014113**.**

2014

J45. Dongyu, X., Cheng, X, **Banerjee**, Huang, S, (2014), "Design fabrication and properties of 2-2 connectivity cement/polymer based piezoelectric composites with varied piezoelectric phase distribution", ***AIP Journal of Applied Physics****,* **116**, 244103.1-7.

J46. Ahmed, R., **Banerjee**, S., (2014), "Low Frequency Energy scavenging using sub-wave length scale acousto-elastic metamaterial", ***AIP Advances*** **4**, 117114 (2014).

J47. **Banerjee**, S., Gummadidala, P. M., Rima R. A., Ahmed, R. U., Kenne, G. J., Mitra, C., Gomaa, O. M., Hill, J., McFadden, S., Banaszek, N., Fayad, R., Terejanu, G., Chanda, A., (2014), "Quantitative acoustic contrast tomography reveals unique multiscale physical fluctuations during aflatoxin synthesis in *Aspergillus parasiticus*"**, *Fungal Genetics and Biology***, Oct 10. pii: S1087-1845(14)00189-3. doi: 10.1016/j.fgb.2014.10.006.

J48. **Banerjee**, S., Terejanu, G., Chanda, A, (2014), 'Uncertainty Quantification driven Predictive multi-scale model for synthesis of mycotoxin ', ***Computational Biology and Bioinformatics***, Vol. 2,1, pp. 7-12, doi: 110.11648/j.cbb.20140201.12.

J49. **Banerjee**, S., Ahmed, R., (2014), 'Phonon Confinement using Spirally Designed Elastic Resonators in Discrete Continuum', ***International Journal of Material Science and Application***, ISSN: 2327-2635, Vol. 3,1, pp. 6-13, doi: 10.11648/j.ijmsa.20140301.12

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CP6. **Banerjee**, S., Application of Computational NDE and SHM for Digital Twin, ASME SMASIS

CP7. Ahmed, H., Sain, T, Ghosh, S., **Banerjee**, S., Metamaterial Lenses for Ultrasonic NDE of thick attenuative structures, ASME Quantitative Nondestructive Evaluation (QNDE) Conference, Virtual, July 2021

CP8. Mustahseen, I, Beard, S., **Banerjee**, S., Ultrasonic Bessel Beam for Nondestructive Evaluation of Attenuative Media, ASME Quantitative Nondestructive Evaluation (QNDE) Conference, Virtual, July 2021

CP9. Patra, S., Ahmed, H., Sadatzi, MS., **Banerjee**, S., Evidence of reduced order nonlinear state of Lamb wave due to stress-relaxation in composites, Health Monitoring of Engineering and Biological Systems XIII, SPIE 2019, Denver, Colorado.

CP10. Chanda, A., **Banerjee**, S., Terejanu, S., (2016) Multiscale mapping of morphomechanical properties of fungi with ultrasound, Biology and Biochemistry of Fungi, Gordon Research Conference, New Hampshire.

CP11. **Banerjee**, S., (2014) “Precursor to damage quantification in composites under fatigue: A method for real time implementation”, A19: NDE and SHM for Composites, 2014 ASC 29 / US-Japan 16 / ASTM D30 Conference, University of California, San Diego.

CP12. Terejanu, S., **Banerjee**, S., Chanda, A., (2014) Multiscale Modeling of Fungi, Multiscale Modeling in Biology, organized by IMAG, NIH, NIH Campus, Bethesda, MD.

CP13. **Banerjee**, S., Ahmed, R., (2013) "Guided Wave Propagation Showing Frequency Trapping in Periodic Structure", Society of Engineering Science, 50 the Annual Technical Meeting and ASME-AMD Annual Summer Meeting (July 28-31 2013).

CP14. Ahmed, R., **Banerjee**, S., (2013) "Introduction of Novel Split Ring Metamaterial for Acoustic Wave Control", Society of Engineering Science, 50 the Annual Technical Meeting and ASME-AMD Annual Summer Meeting (July 28-31 2013).

CP15. **Banerjee**, S., (2013), Incubation of Damage State Quantification in Laminated Composites and Metallic Alloys", Session 3aSAb, San Francisco, CA December 2013, Acoustical Society of America. 2013 Nov; 134(5):4105. doi: 10.1121/1.4831066.

CP16. **Banerjee**, S., (2012), Hybrid Microcontinuum Field Approach for Intrinsic Damage State Quantification", Session 2pSA, 164th Meeting, Acoustical Society of America, Kansas City, MO, 2012

CP17. Beard, S., **Banerjee**, S., Zhang, D., Kumar, A., Chang, F., (2011), "Networked Elements for Resin Visualization and Evaluation (NERVE) System", DARPA Conference, March 2011.

CP18. Qing, X., **Banerjee**, S., Beard, S., (2010) "Maturation of Active Smart patch System for monitoring the integrity of aircraft structures", Aircrafts Airworthiness and Sustainability Conference (AASC), Austin, Texas, 2010.

Presentations in Professional Technical Meeting

PM1. **Banerjee**, S., **(2020)** Ultrasonic Identification and Quantification of Mechanomorphic Pressure exerted by a Biological Species during their Colony Expansion, Ultrasonic Conference, Portugal, June 1-4 2020.

PM2. **Banerjee,** S., **(2019),** Fully automated ultrasonic detection and robotic removal of bones and foreign materials from ground poultry and rendered products, Clemson University, Organized by ACRE, SCDA

PM3. **Banerjee**, S., **(2018)**, Multiscale Computational Wave Field Modeling in Composites., NASA, Langley Research Center, Newport News, VA, Spring Review Meeting 2018.

PM4. **Banerjee**, S., **(2018)**, Bond Quality Index (BQI), a new method for the evaluation of the quality of composite bond lines, NASA, Langley Research Center, Newport News, VA, Spring Review Meeting 2018.

PM5. Chanda, A., **Banerjee,** S., Mechanical Landscaping if Gut Microbiome using Quantitative Acoustic Contrast Tomography (Q-ACT), Invited seminar in COBRE Retreat to demonstrate the technologies applied for colon cancer research, January 2016, River Center at Saluda Shoals Park.

PM6. **Banerjee**, S., Terejanu, G., Chanda, A., Hazardous Aflatoxin Map for South Carolina farmers using trans disciplinary UQ driven multi-scale modeling frame work. Invited as Guest Presented at the USDA State Technical Committee Meeting organized by NRCS, South Carolina in Forestry Department, Columbia, SC on 3rd March 2015.

PM7. Chanda, A.**, Banerjee,** S., Mechanical Landscaping if Gut Microbiome using Quantitative Acoustic Contrast Tomography (Q-ACT), Invited seminar in COBRE Retreat to demonstrate possible new technologies, January 2015, River Center at Saluda Shoals Park.

PM8. Chanda, A., **Banerjee**, S., Quantitative Acoustic Contrast Tomography (Q-ACT): A possible diagnostic tool for studying invasive cellular colonies, Invited seminar in COBRE Retreat to demonstrate possible new technologies, January 2014, River Center at Saluda Shoals Park.

Workshop / Lectures

PM9. **Banerjee**, S., **(2020),** Acoustics and Ultrasonic waves in Periodic Metamaterials: A new frontier in Engineering, University of Arizona, Civil and Engineering Mechanics Department. Feb 2020

PM10. **Banerjee**, S., **(2020),** Acoustics and Ultrasonic waves in Periodic Metamaterials: A new frontier in Engineering, Indian Institute of Technology, Kharagpur, Aerospace Engineering Department. Jan 2020

PM11. **Banerjee**, S., **(2017)**, Acoustic and Ultrasonic Research at University of South Carolina, Indian Institute of Science, Bangalore, India; Aerospace Engineering.

PM12. **Banerjee,** S.**,** Acoustoultrasonics: New directions and visions – A pathway to the new Future of Engineering, Department of Mechanical Engineering, Michigan Tech., Hancock, Michigan (April 2017).

PM13. **Banerjee**, S., Research to Product: The fundamentals of Online NDE and SHM of Composite, December 2014, Skolkovo Institute of Science and Technology, Moscow, Russia. (65 Professional Registered)

Teaching

Course	Title	Institution	Enrollment	Max. Rating
EMCH 220	Mechanical Engineering: Fundamental of Fluid Mechanics	*University of South Carolina*	35	4.7/5.0
EMCH 201 PHYS 311	Introduction to the Application of Numerical Methods for Engineers	*University of South Carolina*	130-165 / yr.	4.5/5.0
ENCP 201	Numerical Methods for Engineers	*University of South Carolina*	30 / yr.	4.4/5.0
EMCH 501	Engineering Analysis I (Advanced Mathematical Methods for Engineers)	*University of South Carolina*	12-25 /yr.	4.8/5.0
EMCH 502	Engineering Analysis I (Advanced Numerical Methods and AI for Engineers)	*University of South Carolina*	12-25 /yr.	5.0/5.0
EMCH 561	Advanced Numerical Methods	*University of South Carolina*	20	4.6/5.0
EMCH 260	Mechanics of Solids	*University of South Carolina*	120-135 /yr.	4.85/5.0
EMCH 764	Mechanical Engineering Projects	*University of South Carolina*	4/yr.	5.0/5.0
EMCH 792	Selected Topics in Mechanics Systems	*University of South Carolina*	4/yr.	5.0/5.0
EMCH 799	Thesis preparation	*University of South Carolina*		NA
EMCH 899	Dissertation preparation	*University of South Carolina*		NA

PhD Graduated 7

No.	Name	Year	Dissertation
1.	Dr. Riaz U. Ahmed	2012-2015	Bio-inspired Design of Mechanical Band Pass Filter with the Ability of Scavenging Energy
2.	Dr. Subir Patra	2014-2018	Ultrasonic Analysis Methods and Tools for Quantitative Material State Awareness of Engineered and Biological Materials
3.	Dr. Vahid Tavaf	2015-2019	Quantification of Material Degradation for Material State Awareness of Composite Materials
4.	Dr. Sajan Shrestha	2017-2019	Computational Wave Field Modeling in Anisotropic Media
5.	Dr. MdSadegh Saadatzi	2015-2020	Design of Bio-inspired Multifrequency Acoustic Sensors and Metamaterial Energy Harvesting Smart Structures
6.	Dr. Hossain Ahmed	2016-2020	Acoustic and Ultrasonic Beam Focusing Through Aberrative and Attenuative Layers
7.	Dr. Fariha Mir	2018-2021	Development of Acoustic Metamaterial Noise Barriers and Simultaneous Harvesting Energy using Smart Materials

MS Graduated 6

No.	Name	Year	Thesis
1.	Ms. Rowshan R. Rima	2012-2014	Modeling of Ultrasonic Wave Filed Emanating from Scanning Acoustic Microscope for Reliable Characterization of Pathogens
2.	Mr. Agbasi Chijioke	2013-2014	Classification of Material Properties of the Foreign Impactors using Acoustoultrasonic Spiral Sensing
3.	Mr. Sajan Shrestha	2015-2017	Computational Wave-field Modeling using Sequential Mapping of Poly-Crepitus Green's Function in Anisotropic Media
4.	Ms. Fariha Mir	2016-2018	Acoustoelastic Metamaterial with Simultaneous Noise Filtering and Energy Harvesting Capability from Ambient Vibration
5	Mr. I. M. Mustahseen	2016-2018	Topological Conduction and Investigation on Multi-occurrence of Dirac-Cone
6.	Mrs. Akter Khaleda	2019-2021	Anisotropic Wave Behavior in Isotropic Material with orthogonal Surface Perturbation

UG Research Assistance 10

No.	Name	Year	Thesis
1.	Mr. Dylan Madisetti	2015-2018	Magellan: Energy harvesting for powering bio devices + Automated discretization for DPSM
2.	Ms. Shelby Rushe	2015-2018	Magellan: Energy harvesting for powering bio devices + Fabrication of artificial basilar membrane
3.	Ms. Omolara E. Olorunniwo	2019-2020	Capstone: Air Coupled ultrasonic scanning system
4.	Mr. Jacob Blottenberger	2019-2021	Magellan: Deep Learning of Memory Effect in Composites
5.	Mr. Corey Leydig	2019-2020	3D automation of non-hydro NDE
6.	Ms. Sierra Batson	2020 - present	NAVY NREIP: Digital Twin for NDE/SHM of Ship Structure
7.	Ms. Tally Bovender	2020 - present	Functionality of Piezo protein in cell membrane
8.	Mr. William Davis	2020 - present	Robotic application of Guided Wave NDE of Composites
9.	Mr. Trey Nelson	2020 - present	Harvesting Energy from Plate Type Harvesters
10.	Mr. Nolan Nimrick	2020 – present	Harvesting Energy from Plate Type Harvesters
11.	Mr. Max Bowman	2021 – present	TBD

Notable Services with Leadership

Department of Mechanical Engineering

- Chair of the IT Committee in the DME, 2019 – present
- Evaluated all course, Proposed, and Implemented new Graduate Tracks in Mechanical Engineering, 2020, Graduate Committee member, 2012-present.

College of Engineering and Computing

- Served as an active member (representing Mechanical Engineering) of the "Distant Learning Best Practice Committee" formed by the Dean.
- Helped many faculties in CEC during the pandemic to teach software tools for effective online teaching; Created YouTube videos; Hold many hands on training sessions. See the article

https://www.sc.edu/study/colleges_schools/engineering_and_computing/news_events/news/2020/banerjee_onlineteaching.php

University

- Chair, Michael J. Mungo Undergraduate Teaching Award Committee, 2019 - 2021
- Served on the Garnet Apple Teaching Award Committee, 2019-2020
- Served on the Michael J Mungo Undergraduate Teaching Award Committee, 2018.

Greater Community

- *Project Director*, Bongotsov, Rhythm of Compassion, supported by SC Humanities ($2200) and SC Art Commission ($2000), 2017 & 2019. Collaborator: UofSC Music School, UofSC African American Studies Program, Claflin University, SC.
- Diversity Equity and Inclusion (DEI) based small projects with nonprofit organizations in SC to serve underrepresented SC communities. 2016-present.
- Taught Science classes to Grade 2 and 3 kids in the Elementary Schools, Chapin, SC, Topic: Force and Motion. 2018, 2019
- Founder and Secretary of a nonprofit organization Choondeshi. 2015-present

Professional Societies

- *Session Organizer*, Metamaterial for NDE in ASME QNDE Conference, 2020 & 2021
- *Editorial Board Member*, Journal of Composite Science, MDPI Publication, 2020 - present
- Organized Conference wide symposium on NDE Diagnostics and Prognostics in 2019 ASME International Mechanical Engineering Congress and Exposition (IMECE), the biggest conference for mechanical engineers, Salt Lake City, UT
- Organized Conference wide symposium on NDE Diagnostics and Prognostics in 2018 ASME IMECE, Pittsburg, PA
- Organized a complete Track composed of 4 topics on NDE Diagnostics and Prognostics in 2017 ASME IMECE, Tampa, Florida.
- Organized a complete Track composed of 9 topics on NDE Diagnostics and Prognostics in 2016 ASME IMECE, Phoenix, Arizona.
- Created and running a Technical Committee on Ultrasonic NDE for Mechanical Systems, which was nonexistent under 'NDE Division' in ASME. Secured 9 members (academia and industry) from all around the globe. Serving as Chair for the committee, selected by executive committee voting. 2015-present
- Organized a session on "Precursor to damage state quantification in materials" Session 11 under "Mechanics of Solids and Structures" at the Society of Engineering Science, 51th Annual technical Meeting at Purdue University 2013.
- Serving as a member of the steering committee of QNDE Conference – Flag ship conf. among NDE community and recently revitalized by ASME by taking over the responsibility. 2019- present.
- *Advisory Board Member*: ASME Journal of Nondestructive Evaluation Diagnostics and Prognostics
- Serving as an Executive Member of the 'NDE Division' in ASME (*this is the outcome of NDE revitalization plan I participated in Jan 2013)*
- Chairing Sessions & Serving as a Program Committee member for the Health Monitoring of Structural and Biological Systems IV Conference SSN10 in SPIE Smart Structure/NDE Conference: help the chair in abstract selection, Review submitted articles, 2012- present.

Professional Services Conference | Journal | Grant Reviewer

Grants Reviewed

- DoE, SBIR FY2020
- DoE, Office of Technology Transition and Technology Commercialization Fund, 2019
- NEUP, DoE, 2014-present
- NSF CMMI: Mechanics of Materials, 2017
- NSF CMMI: Dynamics Systems and Control, 2015
- NSF CMMI: Sensors, Dynamics Systems and Controls, 2016
- USC ASPIRE I Grants to Aspiring Young Faculties, 2016
- USC Magellan Scholar Grants for Under Graduate Research, 2016

Conference Committee

- ASME QNDE 2020-present
- ASME Pressure Vessel Technology Conference, 2018
- ASME IMECE Conference, 2016-present
- SPIE Smart Structures and NDE Conference, 2008-present
- IEEE Conference

Journal Reviews

- Reviewer to more than ~180 National and International Journal Articles including articles submitted to Nature publishing Group

Community Services Culture | Compassion | Teaching

- Frequently Teach younger kids in Elementary School about Science and Technology, 2018-present.
- Served as Cultural Secretary and Founding Member of "Chhondeshi", 2016-2018 (www.chhondeshi.org)
- Served as Treasurer of "Chhondeshi", 2018-2019
- Serving as Secretary of "Chhondeshi", 2019-present
- Participate in Cultural Events to promote Bengali culture and its heritage in North America.

- **Project Director** of Bongotsov: 2017-present: Wrote proposal and received grants from

1. *South Carolina Department of Humanities,* Project Title: Broader understanding of cultural confluence: Bongotsov 2019: The Rhythm of Compassion, (Grant amount $1200) https://schumanities.org/news/bongotsov-2019/
2. *South Carolina Department of Humanities,* Project Title: Broader understanding of cultural confluence: Bongotsov 2017: Bengal Meets the World, (Grant amount $1000)
3. *South Carolina Art Commission*: Project Title: Bongotsov 2019: The Rhythm of Compassion, (Grant amount $1000)
4. *South Carolina Art Commission*: Project Title: Bongotsov 2017: Bengal Meets the World, (Grant amount $1000)
5. *Secured funding for the community events organized by Chhondeshi from local businesses in South Carolina*.

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