

Jacqueline Bridge, Ph.D.
Department of Mechanical & Manufacturing Engineering
The University of the West Indies, St. Augustine, TRINIDAD

QUALIFICATIONS

Engineering

Ph.D.	Cornell University, Ithaca, NY, USA	Theoretical & Applied Mechanics, 1992
B.Sc. (First Class Honours)	The University of the West Indies, St. Augustine, Trinidad	Mechanical Engineering, 1986

Other

Dip. Ed.	University of Technology, Jamaica	Post-graduate Diploma in Education, 1999.
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EXPERIENCE

Head of Department	Department of Mechanical and Manufacturing Engineering, The University of the West Indies, St. Augustine	August 2018 - Present
Senior Lecturer Lecturer	Department of Mechanical and Manufacturing Engineering, The University of the West Indies, St. Augustine	August 2016 - Present Jan. 2002 – August 2016
Guest Lecturer	Wind Engineering Programme Fachhochschule Flensburg (Flensburg University of Applied Sciences)	Feb. 1-14, 2015 Feb. 7-20, 2016
Visiting Scientist	Department of Theoretical & Applied Mechanics, Cornell University	Jan. 2008 – Jun. 2008.
Lecturer	School of Engineering, University of Technology, Jamaica	Sep. 1995 – Dec. 2001
Director,	Mechanical Eng'g Programmes School of Engineering, University of Technology, Jamaica	Sep. 1998 – Dec. 2000
Faculty Curriculum Coordinator	Faculty of Engineering & Computing, University of Technology, Jamaica	Sep. 2000 – Dec. 2001.
Assistant Professor	Mechanical Engineering, Georgia Institute of Technology	Sep. 1992 – June 1995.
Research/Teaching Assistant	Department of Theoretical & Applied Mechanics, Cornell University	Aug. 1988 – Aug. 1992
Refinery Engineer	PetroJam Ltd., Kingston, Jamaica W.I.	Oct. 1986 – June 1988

CURRENT DUTIES

- Undergraduate level courses:
 - MENG 1004 Engineering Dynamics
 - MENG 2003 Mechanical Vibrations
 - MENG 2004 Mechanics of Machines
 - *MENG 2005 Engineering Design I*

- *MENG 2006 Engineering Design II*
 - *MENG 2013 Machine Design II*
 - *MENG 3017 Finite Elements in Engineering Practice.*
- Postgraduate level course:
 - *MENG 6201 Machine Tools Technology*
 - *MENG 6305 Finite Element Methods in Manufacturing*
- Research Supervision
 - *Primary Supervisor*
 - Completed**
 - Robert Birch (Ph.D. co-supervised with Prof. E. Ekwue, conferred August 2019) – *Computational Models for machine-soil interactions*
 - Legena Henry (Ph.D., conferred November 2018) – *An analytical approach to statistical moments associated with non-Gaussian behaviour in Ocean Waves.*
 - Richard Bachoo (Ph.D. conferred February 2013) – *Investigations in the vibration characteristics of engineering structures of composite materials*
 - Richard Bachoo (M.Phil. conferred Nov. 2008) - *An Analytical Statistical Energy Analysis (SEA) model for Flexible Coupling Mechanisms*
 - Renique Murray (M.Phil. conferred Nov. 2008) - *Vibration Based Condition Monitoring of Rotating Machinery using Wavelets*
 - In Progress**
 - Vindachal Maraj (Ph.D. Candidate, submitted September 2019) – *Component mode synthesis methods applied to high frequency vibration analysis of thin walled shell structures.*
 - Devin Singh (Ph.D. Candidate, ECD February 2020) - *Application of Smart Materials for Harnessing Solar Thermal Energy from Asphalt Roads*
 - Shivan Ramnarace (M. Phil. Candidate, ECD August 2020) – *Design of a novel SMA device actuated by low grade heat.*
 - Josh Henry (M. Phil. Candidate, ECD August 2021) – *Design of a novel SMA device actuated by low grade heat.*
 - Undergraduate Project Supervision (On average 10 projects per academic year)

PUBLICATIONS

Thesis:

1. **Bridge, J.** “Chaos in Dynamical Systems with Periodically Disappearing Separatrices”, Aug. 1992, Cornell University.

Refereed Journals:

1. Jodhan, M. and **Bridge, J.** “Characterisation of Induction Motors based on Vibration Signal Analysis using Machine Learning Techniques”, *Journal of the Association of Professional Engineers of Trinidad and Tobago*, Vol 47(2), 2019
2. Murray, R., and **Bridge, J.** “Assessing combustion performance of a diesel reciprocating engine under various fuel blends using a calculus-statistical time series vibration based approach”, *ASME Journal of Engineering for Gas Turbines and Power*, 141(7), 071018
3. Bachoo, R. and **Bridge, J.**, “The modal density of composite beams incorporating the effects of shear deformation and rotary inertia”, *Journal of Sound and Vibration*, vol. 423, p 459-471, 2018.
5 year/Current Journal Impact Factor: 1.893/1.613; Citations 1
4. Bachoo, R. and **Bridge, J.**, “Drive point mobility of anisotropic plates”. *Journal of Sound and Vibration*, vol. 365, p 172-181, 2016.
5 year/Current Journal Impact Factor: 1.893/1.613; Citations 1
5. Henry, L., **Bridge, J.**, et.al. “Key factors around ocean-based power in the Caribbean Region, via Trinidad and Tobago”, *Renewable and Sustainable Energy Reviews* vol 50, p 160-175, 2015
5 year/Current Journal Impact Factor: 7.445/5.901; Citations 3

6. Bachoo, R. and **Bridge, J.**, “The modal distribution and density of fibre reinforced composite beams”. *Journal of Sound and Vibration*, vol. 332(8), p 2000-2018, 2013.
5 year/Current Journal Impact Factor: 1.893/1.613;
Citations 5
7. Ali, E., Ekwue, E., **Bridge, J.** and Birch, R. “A Three-Stack Mechanical Sieve Shaker for Determining Aggregate Size Distribution of Soils”, *West Indian Journal of Engineering*, 35(2), p. 36-44, 2013.
5 year/Current Journal Impact Factor: Unknown; Citations: 4
8. **Bridge, J.**, Rand, R. and Sah, S. “Slow Passage Through Multiple Parametric Resonance Tongues”, *Journal of Vibration and Control*, vol. 15(10), p 1581-1600, 2009.
5 year/Current Journal Impact Factor: 1.74/1.97;
Citations: 10
9. **Bridge, J.**, Rand, R. and Sah, S., “Dynamics of a Ring Network of Phase-Only Oscillators”, *Communications in Nonlinear Science and Numerical Simulation*, vol. 14, pp 3901-3913, 2009.
5 year/Current Journal Impact Factor: 2.67/2.77
Citations: 3
10. **Bridge, J.**, Mendelowitz, L., Rand, R., Sah, S. and Verdugo, A., “Dynamics of a Ring of Three Coupled Oscillators” *Communications in Nonlinear Science and Numerical Simulation*, vol. 14(4), pp 1598-1608, 2009.
5 year/Current Journal Impact Factor: 2.67/2.77
Citations: 12
11. **Bridge, J.** and S. Keshavan, “Vibration Characteristics of a Bi-density Drumhead”, *Mechanics Research Communications*, vol 34, pp 267-274, 2007. 5 year/Current Journal Impact Factor: 1.32/1.05
Citations: 1
12. Quinn, D., R. Rand and **J. Bridge**, “The Dynamics of Resonant Capture”, *Nonlinear Dynamics*, vol. 8, pp 1-20, 1995.
5 year/Current Journal Impact Factor: 2.64/3.009
Citations: 69

Refereed Proceedings:

1. Bachoo, R. and **J. Bridge**, “Analysis of the Power Flow and Modal Energy Distribution in Fiber Reinforced Composite Beams”, *Proceedings of the 26th International Congress on Sound and Vibration, Montreal, Canada, 7-11 July 2019*.
2. Ramnarace, S. and **Bridge, J.** “Analysis of a shape memory alloy spring system under harmonic excitation” in *New Trends in Nonlinear Dynamics: Proceedings of the International Nonlinear Dynamics Conference (NODYCON 2019)*, 17-20 February, 2019.
3. Birch, R, **Bridge, J.** and Ekwue, E. “Investigating fracture and crack propagation in soils using MATLAB: A Novel Technique”, *Caribbean Academy of Sciences Conference, Kingston Jamaica, 27 – 30 November, 2018*
4. **Bridge, J.** “Optimisation of a three mass-three spring vibration energy harvesting system”, *Proceedings of the 24th International Congress on Sound and Vibration, London, 23-27 July 2018*.
5. Singh, D. and **Bridge, J.** “Axisymmetric buckling and strain distributions of shallow spherical caps with free edges”, *Proceedings of the 7th International Conference on Mechanics and Materials in Design, Albufeira, Portugal, 11-15 June 2017*.
6. **Bridge, J.** “Using Online Collaborative exercises to promote the development of critical thinking skills in a large first year class.” *Proceedings of the Research in Engineering Education Symposium, Bogota, Colombia, 2017*.
7. **Bridge, J.** “Mode localisation in a two-span beam with a stiff non-ideal intermediate support”, *Proceedings of the 23rd International Congress on Sound and Vibration, Athens, Greece, 10-14 July 2016*.
8. Henry, L, **Bridge, J.**, Yorke, E, Dass, I., Balliram K., and Henry, R. “The Fluid Mechanics of Mitral Regurgitation in the Human Heart: Towards a better understanding of echocardiograms”, *Proceedings of the World Congress on Engineering 2016* published as *Engineering Letters*, 24:3, EL_24_3_02.
9. Henry, L, **Bridge, J.**, Satahoo, K., Miller, H., Lougheide, B. and Garbett, D. “Equator-Friendly Wave Energy Conversion”, *Proceedings of the World Congress on Engineering 2016, London UK, June 29 – July 1, 2016*.

10. **Bridge, Jacqueline**, “On Phase Locked Motion in a System of Four Phase Only Oscillators With Delayed Communication”, *Proceedings of the 19th International Congress on Sound and Vibration, Vilnius, Lithuania*, 8-12 July 2012.
 11. Bachoo, R and **Bridge J.**, “Vibration transmission in moment excited fibre reinforced composite thin plates and beams”, *Proceedings of the 18th International Congress on Sound and Vibration, Rio de Janeiro, Brazil*, 10-14 July 2011.
 12. **Bridge, Jacqueline**, “The Stability of a Delay Equation Model of Interrupted Cutting”, *Proceedings of the 18th International Congress on Sound and Vibration, Rio de Janeiro, Brazil*, 10-14 July 2011.
 13. Maraj, V. and **Bridge, J.**, “Component Mode Synthesis methods applied to Discontinuous Shell Structures”, *Proceedings of the 18th International Congress on Sound and Vibration, Rio de Janeiro, Brazil*, 10-14 July 2011
 14. **Bridge, Jacqueline**, “Vibration Characteristics of a Primary Plate with a Spring-Connected Secondary Plate Attachment”, *RASD 2010, 10th International Conference of Recent Advances in Structural Dynamics*, Southampton, England, 12-14 July, 2010.
 15. Bachoo, R and **Bridge J.**, “Moment Mobility of Anisotropic Plates”, *RASD 2010, 10th International Conference of Recent Advances in Structural Dynamics*, Southampton, England, 12-14 July, 2010
 16. Bachoo, R. and **Bridge, J.** “Statistical Energy Analysis of a Flexible Coupling Mechanism”, *Proceedings of IRF’ 2009- Integrity, Reliability and Failure: Challenges and Opportunities*, Porto, Portugal, 2009.
 17. Bachoo, R. and **Bridge, J.** “The Modal Density of Composite Beams”, *Proceedings of NOVEM 2009*, Oxford, United Kingdom, 2009.
 18. **Bridge, J.**, “The stability of a delayed quasi-periodic Mathieu equation model of interrupted cutting”, *Proceedings of the CARS/FOR 2008*, Koriyama, Japan, 2008
 19. **Bridge, J.**, “A Web-based Tutorial System in Engineering Dynamics”, *Proceedings of the International Congress on Engineering Education*, Poland, 2005
 20. Ramsaroop, Ravi, **J. Bridge**, C. Sankat and R. Andrews, “Modeling the Heat Transfer in a Hemispherical Shell subjected to a Step Increase in Temperature on its External Boundaries”, *Proceedings of the Inter-American Drying Conference*, Montreal, Canada, August 21 – 23, 2005
 21. Al-Zubaidy, S., A. Johnson and J. Bridge, “Sequential Simulation Used in the Computer Aided Design of Airfoils for Horizontal Axis Wind Turbine Rotors”, *Proceedings of the ASME*. 41995; Volume 2: Fora:47-51, January 01, 2005
 22. **Bridge, J.**, “Shape Optimisation of a Wave Energy Extracting Device”, *CDROM Proceedings of the World Renewable Energy Congress VIII*, Denver, Colorado, USA 29 Aug – 3 Sep, 2004
 23. **Bridge, J.**, “Coulomb Friction in Sliding Mass Absorbers”, *CDROM Proceedings of the 10th International Congress on Sound and Vibration*, Stockholm, Sweden, 7 -10 July, 2003
 24. **Bridge, J.**, “Localisation in a Two Span Beam with a Moving Central Support”, *Proceedings of the VIII International Conference in Recent Advances in Structural Dynamics*, Southampton, UK, 14-16 July, 2003
 25. Fakehinde, O., **J. Bridge** and S. AL-Zubaidy, “Analysis of Heat Transfer Through a Concrete Slab with an Embedded Piping Network”, *CDROM Proceedings of the World Renewable Energy Congress VII*, Cologne, Germany, 29 June – 5 July, 2002.
 26. Johnson, A, **J. Bridge** and S. AL-Zubaidy, “The Shifting Paradigm: Stimulating the Use of Wind Energy Technologies in Jamaica”, *CDROM Proceedings of the World Renewable Energy Congress VII*, Cologne, Germany, 29 June – 5 July, 2002.
 27. Smith, N., **J. Bridge** and E. Clarke, “An evaluation of student’s performance based on their preferred learning styles”, *Proceedings of the 3rd Global Congress on Engineering Education*, Glasgow, Scotland, UK, 30 June - 5 July 2002.
- Citations: 4
28. **Bridge, J.**, “Dynamics of a Stretched String with a Moving End”, *CDROM Proceedings of EM2002, 15th ASCE Engineering Mechanics Conference*, New York, USA, June 2-5, 2002.
 29. Peters, D., S. AL-Zubaidy and **J. Bridge**, , Development of a Dynamic Model of an Upflow Anaerobic Sludge Blanket (UASB) Reactor, *Proceedings of the Environmental Biotechnology Conference: A Massey University 75th Jubilee Event.*, Massey University, Palmerston North, New Zealand, 15-17 April, 2002, pp. 175-182.
 30. **Bridge, J.**, “Stability of a Mechanical Shredder subjected to nonstationary Parametric excitation”, *Proceedings of the 7th Pan American Congress of Applied Mechanics*, Temuco, Chile, Jan 2- 4, 2002, pp 545- 548.

31. AL-Zubaidy, S., **J. Bridge** and A. Johnson, "A Preliminary Study for designing Wind Turbine Blades using Caribbean Technology", Paper AIAA-2000-2939, *Proceeding of the 35th Intersociety Energy Conversion Engineering Conference*, July 24-28, 2000, Las Vegas, Nevada, pp 767-774. Citations: 3
32. **Bridge, J** and P. Johnson, "Promoting a Research Culture within the Engineering Department of the University of Technology, Jamaica", *Proceedings of the Global Congress on Engineering Education*, Cracow, Poland, 6 – 11 September, 1998, pp. 383 –385. Citations: 1
33. **Bridge, J.** and R. Rand, "Chaos and Symbol Sequences in Systems with Periodically-Disappearing Figure-Eight Separatrix", *Bifurcation Phenomena and Chaos in Thermal Convection*, Bau, H.H., Bertram, L.A., and Korpela, S.A. (Editors) ASME WAM, Anaheim, CA., Nov. 8-13, 1992, pp 47-55. Citations: 4

Conference/Seminar Presentations

- **Bridge, J.**, "Fault Characterisation System based on Vibration Signal Analysis Using Machine Learning Techniques", *IEM4-2018 Conference: Striving for performance excellence with quality management and IEM practices; 7th-8th December 2018*; p.68-73
- Singh, D. and **Bridge, J.** "Nonlinear Response of an elastic spherical cap to a descending rigid plate", *Recent Advances in Nonlinear Mechanics 2019, Lodz, Poland, 7 – 10 May, 2019*
- Ramnarace, S. and **Bridge, J.** "Periodic solutions of a shape memory alloy spring system under harmonic excitation by an iterative method", *Recent Advances in Nonlinear Mechanics 2019, Lodz, Poland, 7 – 10 May, 2019*
- Henry, L and **Bridge, J.** "An analytical approach to the statistical moments associated with large ocean waves", *Bulletin of the American Physical Society*, 2018.
- **Bridge, J.** and B. Silvera, "Finite Element Study of an Ocean Wave Energy Conversion System", CDROM Proceedings of SATIS 2003: Sustainable Applications for Tropical Island States, Port-of- Spain, Trinidad, November 11 – 14, 2003
- Fakehinde, O and **J. Bridge**, "Analysis of a Concrete Slab with Embedded Pipes", CDROM Proceedings of SATIS 2003: Sustainable Applications for Tropical Island States, Port-of-Spain, Trinidad, November 11 – 14, 2003
- **Bridge, J.** "Nonstationary Parametric Excitation of a Mechanical Shredder" Book of Abstracts: CDROM Proceedings of the 9th International Congress on Sound and Vibration, Orlando, FL. Jul 8-11, 2002
- **Bridge, J.** and B. Silvera, "A Mathematical Model of a Wave Energy Extracting Device", Proceedings of SATIS 2001: Sustainable Applications for Tropical Island States, Kingston Jamaica, Aug 28-31, 2001, pp 112-122
- Johnson, A., S. AL-Zubaidy and **J. Bridge**, "Using Computational Fluid Dynamics to Design Wind Turbine Rotors for Local Manufacture", Proceedings of SATIS 2001: Sustainable Applications for Tropical Island States, Kingston Jamaica, Aug 28-31, 2001, pp 133-150
- Fakehinde, O., **J. Bridge** and S. AL-Zubaidy, "Analysis of Heat Transfer through a concrete slab with an embedded piping network", Scientific Research Council, Jamaica, 2001.
- **Bridge, J.**, "Renewable Energy Technologies in the Caribbean: Prospects and Problems," REFAD Organizational Meeting, Sandia National Laboratories, June 14-15, 1999.
- **Bridge, J.**, "Engineering Education: Learning Theories and Instructional Media", 12th Annual Association of Professional Engineers of Trinidad and Tobago Meeting, UWI, St. Augustine, January, 1999.
- **Bridge, J.**, B. Silvera and N. Clato-Day, "Attributes of the 21st Century Engineering Graduate", First Latin American & Caribbean Forum on Engineering & Technology Education, Puebla, Mexico, January 1998.
- **Bridge, J.** and B. Silvera, "Comparison of the Greenhouse and Semi-greenhouse Lumber Kilns", SATIS 1997: Sustainable Applications for Tropical Island States, St. Lucia, 1997.

Other

- Bridge, J. and Lew, A (eds.), "CDROM Proceedings of PACAM XII".
- Haraksingh, I and **J. Bridge** (eds.), "Book of Abstracts of SATIS 5, Sustainable Alternatives for Tropical Island States", ISBN: 976-8194-16-2
- Haraksingh, I and **J. Bridge** (eds.), "CDROM Proceedings of SATIS 5, Sustainable Alternatives for Tropical Island States", ISBN: 976-8194-35-9

PROFESSIONAL AWARDS

- UWI Vice-Chancellor Award for Excellence in Teaching, October 2017.
- NGC/UWI Outstanding Research Mentorship Award (Sciences), October 2014
- UWI/Guardian Group Premium Teaching Award, September 2014
- Society of Tribologists and Lubrication Engineers (Park Ridge, Illinois, USA), Special Award for Contributions to Education, March 2007
- World Renewable Energy Network, Oliver Headley Award, September 2004
- Society of Tribologists and Lubrication Engineers (Caribbean Region Section), Special Award for Contributions to Education, March 2004

SERVICE

Departmental

- Head of Department of Mechanical and Manufacturing Engineering, August 2018 – Present,
- Level 3 Coordinator for Bachelor of Science in Mechanical/Industrial Engineering Programmes, 2008 – August 2018
- Group Leader, Engineering Mechanics and Design, 2013 - Present
- Member, Student-Staff Liaison Committee, 2009 – Present
- Member, Industrial Advisory Committee (Mechanical Engineering), 2009 – Present
- Member, Curriculum Committee, 2011 – Present

Service on behalf of the Faculty of Engineering

- Member, Board of the Institute for Gender and Development Studies (previously Centre for Gender & Development Studies), Sep. 2002 – 2006, 2010 - Present.
- Member, Advisory Board of the Centre for Language Learning, 2014 - Present

University

- Residence Manager, Canada and Trinity Halls, October 2007 – Present

Professional Affiliations

- Member, American Society of Mechanical Engineers, 1999 - Present
- Member, American Society of Engineering Educators, 1992 - Present
- Member, International Institute of Acoustics and Vibration, 2002 – Present
- Member Society of Tribologists and Lubrication Engineering, 2004 - Present
- Member, Jamaica Institute of Engineers, 1995-Present
Served on the Engineering Programmes Accreditation Committee of the Professional Engineers Registration Board (Sep. 2000 – June 2002). Assisted in the revision of the accreditation procedures documentation.
- Secretary/Treasurer, Caribbean Solar Energy Society, 2011 – Present

Professional Service

- Served on the Trinidad and Tobago Electricity Commission Committee of Inquiry to investigate the circumstances surrounding the total loss of electrical supply to the island of Tobago on Friday, 29th March 2013. (April 2013)
- Served as judge to the bpTT Ultimate Field Trip Competition, 2013.
- Faculty Advisor, STLE (Caribbean Region Student Chapter), 2007 – 2014
- Editorial Board, West Indian Journal of Engineering
- Reviewer: *Journal of Sound and Vibration, Mathematical and Computer Modelling of Dynamical Systems, IMechE Proceedings Part C: Mechanical Engineering Science, IMechE Proceedings Part L: Journal of Materials, Design and Applications, ASME Transactions of Applied Mechanics, Latin American Journal of Solids and Structures, West Indian Journal of Engineering*

RESEARCH ACTIVITIES

Dynamics & Vibrations

Keywords: Bifurcation theory, chaos, mode localization, parametric excitations, vibration suppression

Summary: The objectives of this research are (i) to investigate how vibrations in machinery may be suppressed through the use of novel passive vibration absorber design using nonlinear theories, (ii) to analyse the effect of variations in operating speeds (and other parametric excitations) on machine performance, (iii) to examine how mode localization occurs in slightly imperfect engineering systems and determine how this may lead to premature failure and (iv) to develop damage detection techniques which utilize operational/experimental modal analysis.

Status: Ongoing

Mathematical Modelling in Alternative Energy Technologies

Keywords: Wind energy, ocean wave energy conversion, computational fluid dynamics, heat transfer through concrete slabs.

Summary: To develop and use computational models to analyse renewable energy technologies.

Status: Ongoing

OTHER

- Volunteer, Habitat for Humanity, 2010 – Present.
- Served as UWI Liaison for The Society of Tribology and Lubrication Engineers (STLE).
 - Co-organised the STLE's Young Engineers Forum. 2003 -2014.
 - Assisted in the development of the STLE Bursary for postgraduate research in Tribology or a related field (TT\$20,000).