Elizabeth Jane Cross - Curriculum Vitae

Dynamics Research Group
Department of Mechanical Engineering
University of Sheffield
Mappin Street, Sheffield
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Summary

- Senior Lecturer, Department of Mechanical Engineering, University of Sheffield.
- Research interests in structural health monitoring, time series analysis, machine learning and nonlinearity in structural dynamics.
- Published articles: 21 peer reviewed papers published including 11 journal papers (+3 currently under review), 7 peer reviewed conference papers and 3 invited book chapters. Further to this 33 papers have been published in conference proceedings and 5 technical reports have been produced.
- In the 2012-2015 period funding awarded £4.2M (PI and CI)
- Awarded University of Sheffield/EPSRC Post-Doctoral Prize Fellowship 2011 (Funding of £43,250).
- Year Tutor and Intro week Coordinator for First year Mechanical Engineering students.

1. Personal Details

Home Address	221 Ringinglow Road, Sheffield, S11 7PT.
Telephone	+44 (0)114 2331506
Email	e.j.cross@sheffield.ac.uk
Date of Birth	23rd October 1985

2. Education

2013-present	**Postgraduate Certificate in Learning and Teaching (CILT)** Masters Level Certificate (60 credits).	University of Sheffield
2008-2012	**PhD, Department of Mechanical Engineering** PhD studentship sponsored by EPSRC. Topic: Novel data mining and performance diagnosis systems for structural health monitoring of suspension bridges. Supervised by Professor Keith Worden.	University of Sheffield
2007-2008	**MSc (Res) in Advanced Mechanical Engineering (Distinction)**	University of Sheffield

Thesis Topic: Approximate Eigenfunction Expansions of the Duffing system – Approximating the FRF of the Duffing Oscillator using the FPK equation. Supervised by Professor Keith Worden.

2004-2007 **BSc. (Hons) Mathematics (First Class)** University of Sheffield

3. Employment History

2015-Present **Senior Lecturer in Dynamics**

Department of Mechanical Engineering

The University of Sheffield

2012-2015 **Lecturer in Dynamics**

Department of Mechanical Engineering

The University of Sheffield

2011-2012 **Research Associate**

The University of Sheffield

24 month research associate post working in collaboration with Messier Dowty on the prediction of loads on landing gears from recorded flight parameters using neural networks and Gaussian processes.

4. Prizes / Awards

Awarded the University of Sheffield/EPSRC Post-Doctoral Prize Fellowship 2011 (£43,250)

A fellowship of the duration of a year, with funding worth £43,250 from EPSRC.

5. Research

Research Interests

My main research interests are in the field of Structural Health Monitoring (SHM), specifically vibration based SHM, which uses monitored dynamic properties of a structure for condition assessment and damage detection. SHM is still a relatively young field and so much of the research that goes on is confined to the laboratory. While it is true that research into SHM is becoming increasingly popular, it has failed, so far, to be taken up in any major way by industry, despite the obvious economic and safety benefits it could offer. My current research is broadly concerned with how SHM can be made to work for the real world.

There is a growing trend within SHM, and also within the closely related field of performance monitoring, to instrument large sensor networks on civil structures. These sensor networks will typically monitor displacement and acceleration of the structure, loads and strains, and also the environmental and operational conditions in which the structure operates. While this is a good step in the right direction if SHM is to be adopted into industry's common practice, many of these campaigns actually do very little with the massive amount of data that is collected on a daily basis. I am currently working with the Vibration Engineering Section now based at the University of Exeter who run many comprehensive monitoring campaigns on a number of bridges, large building and chimneys. The aim of our collaboration with VES is to find sensible ways to use the large amounts of data that have accumulated from large monitoring projects. We are currently in the early stages of the process, which begins with the (not inconsiderable) task of understanding the normal condition of a structure, i.e., how a structure responds to the conditions in which it operates. Before any attempt can be made to implement an SHM system, a sound understanding of a structure's response to its environment must be gained. This leads neatly on to the data normalisation problem in SHM, which a large part of my research is focused on.

The data normalisation problem is a large stumbling block for the implementation of SHM systems in the real world. This is the problem that, outside of the laboratory, many of the features that are monitored for their damage sensitivity are also sensitive to the changing environment and operational conditions any in-service structure must endure. This means that most damage features must undergo some normalisation procedure to remove any dependency on the changing environmental/operational conditions. My current work is focused on investigating how research from other fields can help with this problem; as a relatively young field, SHM can definitely benefit from cross-pollination from other well developed research areas. Econometrics is one good example of a research field that could provide well developed analysis tools for application to SHM; as both fields are concerned with the analysis of nonstationary and/or nonlinear time series, it is natural that we should look to the more developed field for potentially useful tools. Specifically, we are currently exploring how *cointegration*, (from econometrics), can be used to remove the environmentally dependent trends from damage sensitive features. Further to this, my research has also encompassed techniques from machine learning, and naturally time series analysis.

Apart from SHM, I also take an interest in nonlinearity in structural dynamics, this is carried over from the research I undertook for my master's thesis, in which an approximation of the FRF of Duffing's oscillator was found using the Fokker-Planck Kolmogorov equation. Despite the fact that most systems and structures exhibit nonlinear behaviour, they are commonly modelled using linear theory. Studying nonlinearity in structural dynamics is a real challenge because of its mathematical complexity, but one that needs to be undertaken if we wish to model and understand complex systems sufficiently.

Funded Projects

Live Projects

Co-investigator: Structural Dynamics Laboratory for Verification and Validation (LVV) across Scales and Environments - EPSRC Capital Equipment Bid, awarded July 2015.

Co-investigator: Autonomous Inspection in Manufacturing & Remanufacturing (AIMaReM), EPSRC £1.8M, June 2015.

Co-investigator: EngD with Element 6 and AMRC, Accelerated introduction of transformative cutting tool materials. £68,000. August 2015-2019.

Co-investigator: Ricardo-Kongsberg Wind Turbine Bearing sensor development. Funded by Ricardo Uk ltd. £106,655. November 2014-2015.

Principle investigator: LAGEMOSYS: Landing year structural health monitoring. TSB funding (ATI) £358,829. July 2014-2017.

Co-investigator: Vibration control of rigid objects - Phase 2 Research Project with Rolls Royce. £60,000. March 2014-2017.

Principal investigator: EPSRC DTG funded PhD studentship on Nonlinear system identification of offshore jacket structures. Additional funding from Ramboll Oil and Gas of £25,000. September 2013-2016.

Co-investigator: EngD with Messier-Bugatti-Dowty and AMRC, Correlation between machining monitoring signals, cutting tools wear and surface integrity on High Strength Titanium Alloys. Funding of £68,000 provided by MBD. August 2013-2017.

Completed Projects

Co-investigator: STRING Manufacturing of Advanced Composite Structures, EPSRC feasibility study. £ 46,959. September- February 2013.

Co-investigator: KTP with HBM/NCode £124 326 from TSB/nCode. October 2012 - September 2014. In this project I am the KTP supervisor.

Co-investigator: Monitoring of Aircraft Component Health - MACH. £211 494 from TSB and Messier-Bugatti-Dowty. April 2011 - March 2013.

Publications

Book Chapters

In press	K. Worden, G. Manson and **E.J. Cross**. 2014. "On Gaussian Process NARX models and their Higher-Order Frequency Response Functions". To appear in Advances in Simulation-Driven Optimization and Modeling.
2013	K. Worden and **E. J. Cross**, J.M.W. Brownjohn 2013, "Switching Response Surface Models for Structural Health Monitoring of Bridges" Surrogate-Based Modeling and Optimization, Applications in Engineering, Koziel, Slawomir, Leifsson, Leifur (Eds.). Springer.
2013	**E.J. Cross** and K. Worden, 2013. "An introduction to Structural Health Monitoring in the context of civil infrastructure". Health Assessment of Engineering Structures: Bridges and Other Infrastructure. Ed. A. Haldar. World Scientific. (Distributed online as free sample chapter).

Journal Papers

Under review	I. Antoniadou, **E.J. Cross**, W. J. Staszewski, T. Barszcz, K. Worden. "The phase space thresholding method for structural health monitoring and condition monitoring purposes" Submitted to MSSP.
2016	**E. J. Cross**, K. Worden, P. Sartor, P. Southern**,** "Prediction of Landing Gear Loads from Flight Test Data Using Gaussian Process Regression." Submitted to the International Journal of Structural Health Monitoring. In press
2016	T. Baldacchino, **E.J. Cross**, K.Worden, and J. Rowson, "Variational Bayesian Mixture of Experts Models and Sensitivity Analysis for Nonlinear Dynamical Systems" MSSP 2015
2015	N. Dervilis, I. Antoniadou, **E.J. Cross,** K. Worden "A Nonlinear Manifold Strategy for SHM Approaches" Strain 2015
2015	N.Dervilis, K.Worden, **E.J. Cross** "On Robust Regression Analysis as a Means of Exploring Environmental and Operational conditions for SHM Data" Journal of Sound and Vibration **347**:279-296
2015	P.L. Green, **E.J. Cross** and K. Worden, "Bayesian System Identification of Dynamical Systems using Highly Informative Training Data" MSSP **56**:109-122
2014	N. Dervilis, **E.J. Cross,** R. J. Barthorpe and K. Worden, "Robust methods of inclusive outlier analysis for structural health montioring" Journal of Sound and Vibration **333**(20):5181-5195
2014	K. Worden, **E.J. Cross,** I. Antoniadou and A. Kyprianou, 2014, "A Multiresolution Approach to Cointegration for Enhanced SHM of Structures under Varying Conditions - an exploratory study". MSSP 47 (2014), pp. 243-262
2013	E. Figueiredo and **E. J. Cross**, "Linear approaches to modeling nonlinearities in long-term" Journal of Civil Structural Health Monitoring. DOI 10.1007/s13349-013-0038-3

2012 **E.J. Cross**, K. Worden, G. Manson and G. Pierce, 2012, "Features for damage detection with insensitivity to environmental and operational variations". Proceedings of the Royal Society A, **468**, 4098-4122

2012 **E. J. Cross**, K.Y. Koo, J.M.W. Brownjohn and K. Worden, 2013, "Long-term monitoring and analysis of the Tamar Bridge". MSSP, Volume 35, Issues 1–2, Pages 16–34.

2011 **E.J. Cross**, K. Worden and Q. Chen, 2011, "Cointegration; A novel approach for the removal of environmental trends in structural health monitoring data. Proceedings of the Royal Society A **467** 2712-2732 *doi:10.1098/rspa.2011.0023*

2011 **E.J. Cross** and K. Worden, 2011, "Approximation of the Duffing Oscillator Frequency Response Function using the FPK Equation" Journal of Sound and Vibration **330** (2011) 743–756.

Reviewed Conference Papers

2013 I. Antoniadoua, **E.J. Cross** and K. Worden, "Cointegration and the Empirical Mode Decomposition for the analysis of nonstationary diagnostic data", DAMAS 2013

2012 **E. J. Cross**, K.Y. Koo, J.M.W. Brownjohn and K. Worden, 2012, "Filtering environmental loading effects to enhance novelty detection on cable-supported bridge performance", *6th International conference on Bridge Maintenance, Safety and Management, Lake Como, Italy.*

2012 **E. J. Cross**, K. Worden, "Cointegration theory and why it works for SHM", 2012, *7th International Conference on Modern Practice in Stress and Vibration Analysis*.

2011 **E. J. Cross** and K. Worden, 2011, "Approaches to Nonlinear Cointegration with a View Towards Applications in SHM." *Proceedings of the 9th International Conference on Damage Assessment of Structures*, Oxford.

2011 K. Worden, **E. J. Cross** and A. Kyprianou, 2011, "Cointegration and Nonstationarity in the Context of Multi-resolution Analysis." *Proceedings of the 9th International Conference on Damage Assessment of Structures*, Oxford.

2010 **E. J. Cross**, K. Worden, R.J. Sturgeon and Q. Chen, 2010 "A tutorial on Cointegration for engineers - a tool for non-stationary time series analysis." *Proceedings of the 10th International Conference on Recent Advances in Structural Dynamics.*

2009 **E. J. Cross** and K. Worden, 2009 "Approximation of the Duffing oscillator frequency response function using the FPK equation", *7th International Conference on Modern Practice in Stress and Vibration Analysis*.

Conference Papers

2015 G. Holmes, V. Cokonaj, P. Southern, K. Worden and **E.J. Cross**. "Non-stationary models for predicting strain on aircraft landing gear from flight data measurements" ICAF 2015 – Helsinki Finland.

2015 N. Ray, **E.J. Cross**, K. Worden, T. McLeay, S. Turner, J.P. Villain-Chastre. "Relationships between 3D tool geometry, in-process acoustic emissions and

workpiece surface integrity in finish end milling". Condition Monitoring, Oxford 2015

2015 R. Fuentes, T. Huntley, T. Howard, **E. J. Cross**, M. B. Marshall, R. S. Dwyer-Joyce. "Detecting Damage on Wind Turbine Bearings Using Acoustic Emissions and Gaussian Process Latent Variable Models". IWSHM 2015

2015 R. Fuentes, T. Huntley, T. Howard, **E. J. Cross**, M. B. Marshall, R. S. Dwyer-Joyce. "Observations On Acoustic Emissions From Hertzian Contact Compression On Steel" Proceedings of the 42th Leeds-Lyon Symposium on Tribology. September 7-9, 2015, Lyon, France

2015 K. Worden, **E.J. Cross,** N. Dervilis, E.Papatheou, I. Antoniadou, "Structural Health Monitoring: from Structures to Systems-of-Systems?" 9th IFAC Symposium on Fault Detection, Supervision and Safety of Technical Processes

2014 N. Dervilis, I. Antoniadou, **E.J. Cross,** K. Worden "A Nonlinear Manifold Strategy for SHM Approaches" ASHMCS 2014

2014 N.Dervilis, K.Worden, **E.J.Cross** "Nonlinear robust regression analysis as a means of exploring SHM data" ISMA 2014

2014 K. Chandrasekhar, J. A. Rongong , **E. J. Cross** "Frequency and Amplitude Dependent Behaviour of Tangled Metal Wire Dampers" ISMA 2014

2014 R. Fuentes, **E.J. Cross**, A. Halfpenny, K. Worden, R.J. Barthorpe, Autoregressive Gaussian Process Regression for Structural Damage Detection. ISMA 2014

2014 R. Fuentes, **E.J. Cross**, A. Halfpenny, K.Worden, R.J. Barthorpe, "Aircraft parametric structural load monitoring using Gaussian Process Regression". EWSHM 2014

2013 **E. J. Cross**, K. Worden, P. Sartor, P. Southern**,** "Prediction of Landing Gear Loads from Flight Test Data Using Gaussian Process Regression", IWSHM 2013.

2013 I. Antoniadoua, **E.J. Cross** and K. Worden, "Cointegration for the Removal of Environmental and Operational Effects using a Single Sensor" IWSHM 2013.

2013 K. Worden and **E.J. Cross** "Gaussian Process Regression Trees for Surrogate Models and Cointegration in the Health Monitoring of Civil Infrastructure." IWSHM 2013.

2013 R. Fuentes-Esquivel, A. Halfpenny, R.J. Barthorpe, **E. J. Cross**, K. Worden, "Fatigue Damage and Load Identification on Ground Vehicles Via a Linear Gaussian Framework." IWSHM 2013.

2013 R. Westgate, J.MW. Brownjohn, K.Y. Koo, **E. J. Cross**, K. Worden, "Thermal effects on the Tamar and Humber Bridge". SMAR 2013

2013 R. Fuentes-Esquivel, A. Halfpenny, **E. J. Cross**, K. Worden, "Order filtering of rotating machinery operational response data using wavelet packet decomposition and resampling techniques", *IOMAC 2013*

2012 F. Lu, Q. Chen, **E J Cross**, K Worden, 2012, "Cointegration testing method for condition monitoring of nonstationary engineering systems", 23rd International Conference on Adaptive Structures and Technologies (ICAST 2012), October 11-13, 2012, Nanjing, China.

2012 **E. J. Cross**, K. Worden, 2012, "GP-NARX and higher order FRFs", *ISMA 2012, International conference on noise and vibration engineering.*

2012	**E. J. Cross**, K. Worden, P. Sartor, P. Southern, 2012, "Prediction of Landing Gear Loads Using Machine Learning Techniques", *Proceedings of the 5th European Workshop on Structural Health Monitoring*
2012	K. Worden, **E.J. Cross**, E. Barton, 2012, "Damage detection of the NPL footbridge under changing environmental conditions" *Proceedings of the 5th European Workshop on Structural Health Monitoring.*
2012	E. Figuarado, R. Westgate, **E. J. Cross**, J.MW. Brownjohn, K. Worden , 2012, "Applicability of Markov Chain Monte Carlo for damage detection on data from the Tamar suspension bridge and Z24", *Proceedings of the 5th European Workshop on Structural Health Monitoring*
2011	R.J. Barthorpe, **E.J. Cross**, E. Papatheou , K. Worden, 2011, "Some recent developments in SHM", *Proceedings of 2nd International Workshop on Smart Diagnostics of structures.*
2011	**E. J. Cross**, K.Y. Koo, J.M.W. Brownjohn and K. Worden, 2011, "Cointegration and SHM of bridges", *Proceedings of 8th International Workshop on Structural Health Monitoring, Stanford.*
2011	**E. J. Cross**, and K. Worden, 2011, "Nonlinear cointegration as a combinatorial optimisation problem for damage detection", *Proceedings of 8th International Workshop on Structural Health Monitoring, Stanford.*
2011	**E.J. Cross**, K. Worden and G. Manson, 2011, "Cointegration for the removal of environmental trends in SHM data", *Proceedings of the 2011 International Conference on Structural Engineering Dynamics, Tavira, Portugal*.
2010	**E. J. Cross**, K.Y. Koo, J.M.W. Brownjohn and K. Worden, 2010, "Long-term monitoring and data analysis of the Tamar Bridge", *Proceedings of ISMA, International conference on noise and vibration engineering.*
2010	**E.J. Cross** and K. Worden, 2010, "An approach to nonlinear cointegration with application to structural health monitoring data." *Proceedings of the 5th European Workshop on Structural Health Monitoring.*
2010	K.Y. Koo, **E.J. Cross**, K. Worden, J.M.W. Brownjohn, D. List, R. Cole and T. Wood, 2010 "Long-term Structural Health Monitoring for Tamar Suspension Bridge". *Proceedings of the 5th International Conference on Bridge Maintenance, Safety and Management*.
2010	**E.J. Cross**, K. Worden, K. Y. Koo and J.M.W. Brownjohn, 2010, "Modelling environmental effects on the dynamic characteristics of the Tamar suspension bridge" *Proceedings of IMAC XXVIII*.
2010	D. Harvey, **E.J. Cross**, R. Silva, C. Farrar and M. Bement, 2010 "Input Estimation from Measured Structural Response" *Proceedings of IMAC XXVIII*
2009	R. Sturgeon, **E. J. Cross**, K. Worden, J.M.W. Brownjohn, K.Y. Koo and Q. Chen, 2009, "Elimination of long-term trends in SHM data using cointegration", *Proceedings of 7th International Workshop on Structural Health Monitoring, Stanford.*
2009	J.M.W. Brownjohn, K. Worden, **E.J. Cross**, D. List, R. Cole and T. Wood, 2009, "Thermal effects on performance on Tamar Bridge" *4th International Conference on Structural Health Monitoring on Intelligent Infrastructure (SHMII-4).*

Technical Reports

2014	**E. J. Cross**, K. Worden, P. Sartor, P. Southern, 2011, MACH WP3 Report 4: Final Report.
2012	**E. J. Cross**, K. Worden, P. Sartor, P. Southern, 2011, MACH WP3 Report 3: Model development.
2011	**E. J. Cross**, K. Worden, P. Sartor, P. Southern, 2011, MACH WP3 Report 2: Preliminary models.
2011	**E. J. Cross**, K. Worden, P. Sartor, P. Southern, 2011, MACH WP3 Report 1: Analysis of data sources.

Standing / Other Relevant Research Experience

EPSRC Panel Member 2014: I have been invited to be a panel member in EPSRC Engineering Prioritisation Panel Meeting (August 2014).

EACS 2016 Co-director of the Organising Committee: Along with Dr R.J. Barthorpe and Professor D. Wagg (Conference Chair), we are working to bring the European Conference on Structural Control to Sheffield in 2016.

Reviewer for International Journals: I am a regular reviewer for the international journal Mechanical Systems and Signal Processing, the International Journal of Shock and Vibration and the Journal of Engineering Mechanics.

Session Chair at IWSHM 2013: Co-chair of session "Special Session: Guided Waves in Structures for SHM".

PhD External Examiner: External Examiner for C. Sbarufatti, Politecnico Milano. Thesis title: "Fatigue crack monitoring of helicopter fuselages and life evaluation through sensor networks".

Invited Speaker at NPL conference: One day conference on Structural Health Monitoring. Talk entitled "Cointegration and SHM of bridges". December 2012.

Invited Speaker/Guest lecture at Los Alamos National Laboratory: Invited guest lecture to the Engineering Institute at Los Alamos National Laboratory. Talk entitled "An introduction to cointegration for SHM". June 2012

Computer languages: matlab, python and fortran.

Consultancy

Consultation for industry: I have carried out a number of consultancy projects for Whitehopleman, an industry expert on cement production. These projects have included a full scale mechanical review of a rotary kiln, and the development of an optimal plant production plan.

Research Impact

Follow on funding from MACH (Aircraft Health Monitoring): The MACH project (coordinated by Messier-Bugatti-Dowty (MBD)) that I was a researcher on and latterly a co-investigator looked at the development of machine learning algorithms for the prediction of load on landing gear. The innovations

and findings in the MACH project will be built upon in a new TSB funded project LAGEMOSYS, which was supported by MBD on the back of the MACH project.

KTP Impact: The KTP project with HBM-nCode has developed a number of commercial applications of the research tools we use for SHM. As a direct consequence of the collaboration nCode have several software packages under development for inclusion in their Glyphworks package. The developed 'Glyphs' include wavelet denoising, kalman filtering, principal component analysis and factor analysis.

6. Teaching

Teaching Experience/Current Duties

Module Coordinator: MEC410 – Structural Vibration; analysis and practice: A 20 lecture masters level course on advanced topics in vibration. This course has been adapted from the lecture series of the same name previously taught by Professor W. Staszewski. Since I have taken over, all material has been reviewed and updated, the course notes, tutorials and lectures have been entirely rewritten and now provide a comprehensive learning resource for students. The lectures and tutorials are run in an interactive style, with videos, demonstrations and group discussions. I have also introduced a number of guest lectures into – with emphasis on industrial applications.

Module lecturer: MEC133 – MATLAB short course: A first year course on MATLAB for engineers. I have developed this course as part of a first year lab module in order to begin the process of developing computer programming skills in our undergraduate cohort. The course comprises of three lectures and four two-hour lab classes. I have developed online tutorials for the lab classes designed to develop basic programming skills as well as knowledge of MATLAB itself. All problems and assessments are oriented to engineering problems. During the lecture sessions clickers are used to give feedback on the lab classes and a cooperative learning approach is taken to encourage the students to assess their strengths and weaknesses.

Mechanical Engineering tutor:

1st year – 4 tutees; 2 hours of academic tutorials every week in term time

2nd & 3rd year - 8 tutees; pastoral tutorials throughout semesters

Year in Industry – responsible for tutoring and visiting students in their year in industry.

MSc – 4 tutees; pastoral tutorials throughout semesters

MSc/MEng project student supervision, 2013-14, 10 current projects running (4 as co-supervisor)

- Understanding the effect of environmental and operational variation on the Humber Bridge
- Identifying terrain roughness from monitoring ground vehicles
- Simulating damage scenarios for structural health monitoring
- Optimisation of vibration plate technology for exercise
- Automated systems for processing structural health monitoring data
- Vehicle resilience to impulsive shock loads
- Manufacturing and Execution Systems for Process Monitoring and Planning (supervised in collaboration with the AMRC)

- Application of manufacturing planning and costing software (supervised in collaboration with the AMRC)
- Modelling and experimental analysis of high temperature and high strain rate deformation of aerospace materials (supervised in collaboration with the AMRC)
- Effect of workpiece temperature on the machining of carbon fibre reinforced polymer composite materials. (supervised in collaboration with the AMRC)

PhD supervision - current students:

- 1st supervisor: Ramon Fuentes – Practical application of data driven SHM technology for ground and aerospace vehicles. 3rd year part time PhD student - staff candidate, originally funded by NCode KTP.
- 1st supervisor: Nathan Ray - Correlation between machining monitoring signals, cutting tools wear and surface integrity on High Strength Titanium Alloys. 2nd year EngD student – project led and funded by AMRC and Messier-Bugatti-Dowty.
- 1st Supervisor: Iason Iakovidis – Econometric methods for SHM. 1st Year PhD student – department funded studentship.
- 1st Supervisor: Haichen Shi – Nonlinear cointegration for SHM. 1st Year PhD student – China Scholarship.
- 1st Supervisor: Chandula Wickramarachchi - Accelerated introduction of transformative cutting tool materials. EngD student – project led and sponsored by AMRC and Element Six – starting September 2015.
- 1st supervisor: Timothy Rogers – Nonlinear system identification of offshore jacket structures. Starting September 2015 (in collaboration with, and partly funded by, Ramboll Oil & Gas).
- 2nd supervisor: Kartik Chandrasekhar – Vibration control using metal rubber. 3rd year PhD student (with J. Rongong).
- 2nd supervisor/co-supervisor: Suzhou Chen – Uncertainty analysis of particle dampers. 1st Year student. Studentship funded by Rolls-Royce (with J.Rongong).
- 2nd Supervisor: Niloufar Motazedi - Multi-scale dynamic modelling by integrating PIC and FEA codes with Lagrangian Dynamics. 1st year student (with M. Cartmell).

PhD supervision - previous students:

- 2nd supervisor: Sophia Pavlopoulou – On Structural Health Monitoring of Aircraft Adhesively Bonded Repairs - completed PhD 2013.

Academic Away day session coordinator: Co-chair of a session on optimising teaching in our new teaching spaces. July 2014.

Guest lectures: Delivered two lectures on MEC308 (Applied Noise and Vibration) under peer observation and received and discussed feedback.

Guest seminar: Guest seminar for MEC 416 Computer modelling and validation.

7. Leadership, management and administration

Year Tutor (First Year) and Intro Week Coordinator: Coordinator of first year studies in the Department of Mechanical Engineering. Duties include overseeing and coordinating intro week, allocation of tutors, overseeing of tutoring system, coordination of midterm assessments, progression & attendance, problem solving for students in difficulty, disciplinary matters for first year students and coordinating solutions to problems with modules.

Teaching Committee Member

Computer Teaching Working Group Member

Mechanical Engineering representative for the Engineering-Maths Liaison Group

Women in Engineering Steering Committee Member

Departmental Coordinator of Student Mentoring Scheme

LAGEMOSYS project coordination: I coordinate the LAGEMOSYS project (3 year project funded by the TSB). Duties include line management of one Research Associate.

KTP Supervisor: Coordination of KTP project with HBM-nCode. Includes supervision of KTP associate.