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Qualifications

Mechanical and Aeronautical Engineering, PhD, Non-stationary Time-dependent ARMA Random Vibration Modeling, Analysis and SHM with Wind Turbine Applications
Award Date: 19. Jan 2016

Electronic Engineering, BEng
Award Date: 30. Jan 2007

Research outputs

Sequential Bayesian updating of local LPV models for structural damage detection under changing environment
Avendaño-Valencia, L. D., 1. Jul 2025, In: Mechanical Systems and Signal Processing. 234, 32 p., 112775.

A fast identification algorithm for Linear Parameter Varying Vector AR models of short-term drivetrain vibration
Avendaño-Valencia, L. D. & Georgantopoulou, A., 2023, *Eccomas Proceedia SMART*. ECCOMAS Proceedia, p. 1161-1172

Virtual fatigue diagnostics of wake-affected wind turbine via Gaussian Process Regression
Avendaño-Valencia, L. D., Abdallah, I. & Chatzi, E. N., Jun 2021, In: Renewable Energy. 170, p. 539-561

Video-based eye tracking performance for computer-assisted diagnostic support of diabetic neuropathy
Avendaño-Valencia, L. D., Yderstræde, K. B., S. Nadimi, E. & Blanes-Vidal, V., Apr 2021, In: Artificial Intelligence in Medicine. 114, 36 p., 102050.

State-space modal representations for decomposition of multivariate non-stationary signals
Avendaño-Valencia, L. D., Avendaño, L. E., Delgado-Trejos, E. & Cuesta-Frau, D., 2021, In: IFAC-PapersOnLine. 54, 7, p. 475-480

Sequential Bayesian model updating for online vibration data assimilation and SHM
Avendaño-Valencia, L. D., Nov 2020.

Gaussian process models for mitigation of operational variability in the structural health monitoring of wind turbines
Avendaño-Valencia, L. D., Chatzi, E. N. & Tcherniak, D., Aug 2020, In: Mechanical Systems and Signal Processing. 142, 23 p., 106686.

Multivariate GP-VAR models for robust structural identification under operational variability
Avendaño-Valencia, L. D. & Chatzi, E. N., Apr 2020, In: Probabilistic Engineering Mechanics. 60, 13 p., 103035.

Modelling Long-Term Vibration Monitoring Data with Gaussian Process Time-Series Models
Avendaño-Valencia, L. D. & Chatzi, E. N., 2019, In: IFAC-PapersOnLine. 52, 28, p. 26-31

Gaussian Process Time-Series Models for Structures under Operational Variability
Valencia, L. D. A., N. Chatzi, E., Young Koo, K. & M. W. Brownjohn, J., Dec 2017, In: Frontiers in Built Environment. 3, 69 , 19 p.

Damage/fault diagnosis in an operating wind turbine under uncertainty via a vibration response Gaussian mixture random coefficient model based framework
Avendaño-Valencia, L. D. & Fassois, S. D., Jul 2017, In: Mechanical Systems and Signal Processing. 91, p. 326-353

In-operation wind turbine modal analysis via LPV-VAR modeling
Avendaño-Valencia, L. D., Chatzi, E. N. & Fassois, S. D., 2017, *Rotating Machinery, Hybrid Test Methods, Vibro-Acoustics & Laser Vibrometry: Proceedings of the 35th IMAC, A Conference and Exposition on Structural Dynamics 2017.* Di Maio, D. & Castellini, P. (eds.). Vol. 8. p. 47-57

Sensitivity driven robust vibration-based damage diagnosis under uncertainty through hierarchical Bayes time-series representations
Avendaño-Valencia, L. D. & Chatzi, E. N., 2017, *Procedia Engineering.* Vestroni, F., Gattulli, V. & Romeo, F. (eds.). Elsevier, Vol. 199. p. 1852-1857

Gaussian Mixture Random Coefficient model based framework for SHM in structures with time-dependent dynamics under uncertainty
Avendaño-Valencia, L. D. & Fassois, S. D., 2016, In: Mechanical Systems and Signal Processing. 97, p. 59-83

Markov Chain Monte Carlo estimation of non-stationary GSC-TARMA models: Application to random vibration modelling and analysis for an operating wind turbine
Avendaño-Valencia, L. D. & Fassois, S. D., 2016, *Proceedings of ISMA 2016 - International Conference on Noise and Vibration Engineering and USD2016 - International Conference on Uncertainty in Structural Dynamics.* Sas, P., Moens, D. & van de Walle, A. (eds.). ISMA, p. 4153-4167

Parametric Nonstationary Random Vibration Modeling with SHM Applications
Avendaño-Valencia, L. D. & Fassois, S. D., 1. Jan 2015, *Encyclopedia of Earthquake Engineering.* Springer Science+Business Media, p. 1834-1849

Natural vibration response based damage detection for an operating wind turbine via Random Coefficient Linear Parameter Varying AR modelling
Avendaño-Valencia, L. D. & Fassois, S. D., 2015, *11th International Conference on Damage Assessment of Structures (DAMAS 2015).* Vol. 628. (Journal of Physics: Conference Series).

Non-stationary Random Coefficient Models for Vibration-based SHM in Structures Influenced by Strong Operational and Environmental Variability
Avendaño-Valencia, L. D., 2015, *STRUCTURAL HEALTH MONITORING 2015: SYSTEM RELIABILITY FOR VERIFICATION AND IMPLEMENTATION, VOLS. 1 AND 2.*

Non-stationary random coefficient models for vibration-based SHM in structures influenced strong operational and environmental variability
Avendaño-Valencia, L. D. & Chatzi, E. N., 2015, *Structural Health Monitoring 2015: System Reliability for Verification and Implementation - Proceedings of the 10th International Workshop on Structural Health Monitoring, IWSHM 2015.* Chang, F.-K. & Kopsaftopoulos, F. (eds.). p. 799-806

Surrogate modeling of nonstationary systems with uncertain properties
Avendaño-Valencia, L. D., Chatzi, E. N. & Spiridonakos, M. D., 2015, *Safety and Reliability of Complex Engineered Systems - Proceedings of the 25th European Safety and Reliability Conference, ESREL 2015.* Podofillini, L., Sudret, B., Stojadinović, B., Zio, E. & Kröger, W. (eds.). p. 4079-4087

Stationary and non-stationary random vibration modelling and analysis for an operating wind turbine
Avendaño-Valencia, L. D. & Fassois, S. D., 3. Aug 2014, In: Mechanical Systems and Signal Processing. 47, 1-2, p. 263-285

Nonlinear model for condition monitoring of non-stationary vibration signals in ship driveline application
Valencia, L. D. A., Cardona-Morales, O. & Castellanos-Dominguez, G., 20. Feb 2014, In: Mechanical Systems and Signal Processing. 44, 1-2, p. 134-148

Decoupled estimation of the parameters and hyperparameters of generalized stochastic constraint TARMA models
Avendano-Valencia, L. D. & Fassois, S. D., 2014, *ISCCSP 2014 - 2014 6th International Symposium on Communications, Control and Signal Processing, Proceedings.* p. 429-432

Robust fault detection based on multiple functional series TAR models for structures with time-dependent dynamics
Avendaño-Valencia, L. D. & Fassois, S. D., 2014, *7th European Workshop on Structural Health Monitoring, EWSHM 2014 - 2nd European Conference of the Prognostics and Health Management (PHM) Society.* p. 804-811

Generalized stochastic constraint TARMA models for in-operation identification of wind turbine non-stationary dynamics
Avendaño-Valencia, L. D. & Fassois, S. D., Jul 2013, In: Key Engineering Materials. 569-570, p. 587–594

In-operation identification of wind turbine non-stationary dynamics: A comparison of various methods
Avendaño-Valencia, L. D. & Fassois, S. D., 2013, *5th International Operational Modal Analysis Conference, IOMAC 2013.* p. 1-8

In-operation output-only identification of wind turbine structural dynamics: Comparison of stationary and nonstationary approaches
Avendaño-Valencia, L. D. & Fassois, S. D., 2012, *International Conference on Noise and Vibration Engineering 2012, ISMA 2012, including USD 2012: International Conference on Uncertainty in Structure Dynamics.*

In-operation identification of a wind turbine structure via non-stationary parametric models
Avendaño-Valencia, L. D., Spiridonakos, M. D. & Fassois, S. D., 2011, *Structural Health Monitoring 2011: Condition-Based Maintenance and Intelligent Structures - Proceedings of the 8th International Workshop on Structural Health Monitoring.*

Feature extraction from parametric time-frequency representations for heart murmur Detection
Avendaño-Valencia, L. D., Godino-Llorente, J. I., Blanco-Velasco, M. & Castellanos-Dominguez, G., 2010, In: Annals of Biomedical Engineering.

Reduction of irrelevant and redundant data from TFRs for EEG signal classification
Avendaño-Valencia, L. D., Martínez-Vargas, J. D., Giraldo, E. & Castellanos-Domínguez, G., 2010, *2010 Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBC'10.*

TFR-based feature extraction using PCA approaches for discrimination of heart murmurs
Avendaño-Valencia, L. D., Martinez-Tabares, F., Acosta-Medina, D., Godino-Llorente, I. & Castellanos-Dominguez, G., 2009, *Proceedings of the 31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society: Engineering the Future of Biomedicine, EMBC 2009.*

Improved parametric estimation of time frequency representations for cardiac murmur discrimination
Avendaño-Valencia, L. D., Ferrero, J. M. & Castellanos-Domínguez, G., 2008, *Computers in Cardiology.*

Improvement of an extended kalman filter power line interference suppressor for ECG signals
Avendaño-Valencia, L. D., Avendaño, L. E., Ferrero, J. M. & Castellanos-Domínguez, G., 2007, *Computers in Cardiology.*

Teaching and supervision

Machine Learning methods for Monitoring of Structures

Avendaño-Valencia, L. D.
09/02/2022 → 25/05/2022

Signals and systems

Valencia, L. D. A.
04/08/2008 → 12/12/2008

Structural Dynamics

Valencia, L. D. A., Vesterholm, K. K. & Arora, V.
01/09/2021 → 31/01/2022

Structural vibrations

Avendaño-Valencia, L. D.
07/09/2021 → 20/12/2021

Surrogates for Time-Varying Systems

Valencia, L. D. A.
17/03/2017 → 17/03/2017

Time-Series Methods for Condition Monitoring: An Introduction

Valencia, L. D. A.
25/10/2018 → 25/10/2018