

Prof. Jérôme Antoni
University of Lyon, France

Personal details

Date and place of birth:

Nationality:

Situation:

Home address:

Office address:

Phone:

E-mail address: jerome.antoni@insa-lyon.fr

Employment

- Full-time Professor at the University of Lyon, France, Laboratory of Vibrations and Acoustics (<http://lva.insa-lyon.fr/>), since 2011
- Full-time Professor at the University of Technology of Compiègne, France, Laboratory Roberval in Mechanics UMR CNRS 6253 (2008-2011)
- Associate Professor at the University of Technology of Compiègne, France, Laboratory Roberval in Mechanics UMR CNRS 6253 (2001-2011)
- Post-doctoral position at the University of New South Wales, Laboratory of Acoustics and Vibration, Sydney Australia (2001).
- Research Assistant at Jean Monnet University, France, Laboratory for Signals and Industrial Process analysis EA 3059 (2000)
- Research Assistant at the Grenoble Institute of Technology, France, Laboratory for Signals and Industrial Process analysis EA 3059 (1998-2000)
- Lecturer at the CNAM, Saint-Etienne, France (1998)
- Officer in the French Navy, sub-lieutenant (1996-1997)

Education

- Habilitation for Research Supervision obtained from the University of Technology of Compiègne, France, 23/06/2006. Title: "Fourier Methods for the Analysis of Mechanical Systems"
- Ph.D. degree from the Grenoble Institute of Technology, France, 11/12/2000. Title: "Angular Resampling and Cyclostationarity for the Vibration Diagnostics of Internal Combustion Engines"
Highest honours. Awarded by the 1st price from the university.
- M.S. degree in mechanical engineering from University of Technology of Compiègne, France (1995)
- School of Mechanical Engineering, USA. Selected for an exchange program with the University of Pennsylvania (PA) (1992-1993)

Research areas

The main direction of research activity is concerned with the development of signal processing methods for mechanical systems, in particular for Condition Monitoring. Another theme is the resolution of inverse problems in acoustics and vibrations, in particular from probabilistic approaches. Current interests deal with the cyclostationary modelling of rotating machine signals, blind source separation, and (non-) parametric identification of mechanical systems and material properties, source identification and acoustic imaging.

Scientific responsibilities

Head of Laboratoire Vibrations Acoustique (research group, 20 permanent staff) (2021-2024)

Expertise for governmental organisations

- Regular expert for the ANR (National Research Agency <http://www.agence-nationale-recherche.fr/>)

- Regular expert for the AERES (Evaluation Agency for Research and Higher education <http://www.aeres-evaluation.fr/>)
- Expert for the FWO (National Fund for Scientific Research, Belgium, www.fwo.be) (2010 -- 2015)
- Regular expert for the Italian Research Assessment Exercise

Industrial consulting

- Several contracts with the transportation industry (Renault, PSA, Airbus, SAFRAN, RATP, Michelin, SOMFY) and Consulting companies in vibration and acoustics (CETIM, MicrodB, OROS)

PhD Supervision

Supervision of 30 PhDs, including 8 in progress.

Member of Scientific Societies

- AFM (French Association for Mechanics <http://afm.asso.fr/>)
- SFM (French Society of Mechanicians <http://www.sfmeca.fr/>)
- SFA (French Society of Acoustics <https://www.sfa.asso.fr/fr/accueil>)

Projects

National projects

- Partner in CALM-AA (CiblAge des sources par voie Logicielle et Méthodes inverses pour l'AéroAcoustique). National project coordinated by MicrodB and funded by the Region Rhones-Alpes (2020-2023)
- Partner in LUG2 (Modular and efficient tools for acoustic imaging). National project coordinated by MicrodB and funded by the Region Rhones-Alpes (2016-2019)
- Labcom P3A, a virtual lab composed of MicrodB, Ecole Centrale de Lyon and INSA-Lyon with research activities in imaging techniques for aeroacoustics. Project funded by the National Research Agency (2013-2016)
- Partner in SEMAFOR (inverSE Method for the characterization of Aeroacoustic sources generated by turboFan rotORs), project funded by the Fondation Recherche Aéronautique Espace (2012-2016)
- Partner in OpenLab Vibro-Acoustic-Tribology@Lyon, a virtual lab controlled by PSA in the Rhones-Alpes Region, since 2011

European projects

- Partner in MOIRA (MONItoring of large scale complex technologicAl systems). European Marie-Curie project (2021-2025).
- Partner in ECODRIVE (Noise and vibration in eco-efficient powertrains). European Marie-Curie project (2020-2024).
- Partner in ADAPT (ADvanced Aeroacoustic Processing Techniques). European Clean-Sky project (2017-2020).
- Partner in PBNv2 (Next generation Pass By Noise approaches for new powertrain vehicles). European Marie-Curie project (2016-2020)
- Partner in COST Action TU1105 (NVH analysis Techniques for Design and Optimization of Hybrid and Electric Vehicles), (2011-2015)

Teaching

Undergraduate level

- Statistics (estimation, hypothesis test, ANOVA)
- Mathematics for engineers (ODE, Fourier and Laplace transforms, distributions, Hilbert spaces)
- Introduction to signal processing (sampling, Fourier analysis of discrete signals, filters)
- Acoustics for engineers (wave equation, sound power and intensity, measurement techniques, room acoustics)
- Newtonian mechanics

Graduate level

- Introduction to stochastic processes
- Advanced vibrations (continuous systems)

Scientific achievements

Invited conference

- ICMIC 2017, 9th International Conference on Modelling, Identification and Control, July 10-12 2017, Kunming, China, "Current Aspects of Signal Processing for Health Monitoring of Rotating Machines"
- PHM2016, Prognostics and System Health Management Conference, Chengdu, China, October 19-21, 2016, "Diagnostic indicators in vibration-based Condition Monitoring: connections between cyclostationarity, higher-order statistics, and sparsity"
- NOVEM2015, Noise and Vibration: Emerging Methods, 13-15 April 2015, Dubrovnik, Croatia "Bayesian vision of inverse problem in acoustics"
- 9th IFToMM International Conference on Rotor Dynamics, 22-25 September 2014, Milan, Italy, "Signal processing for machine diagnosis: the quest for hidden information"
- 10th International Conference on Condition Monitoring and Machinery Failure Prevention Technologies, CM-MFPT2013, 18 – 20 June 2013, Kraków, Poland. "A (Short) Review on the Spectral Kurtosis and its use in Condition Monitoring"
- 2nd International Conference Condition Monitoring of Machinery in Non-Stationary Operations CMMNO2012, March 26 - 28, 2012 - Hammamet – Tunisia. Cyclo-non-stationarity, or the quest of cyclic information under nonstationary regime"
- 5th International Congress on Technical Diagnostics, 3-6 September 2012, Kraków, Poland, "Hidden faults in wind turbine's drivetrain and how cyclostationarity can be used to detect it"
- 2nd International Workshop on Smart Diagnostics of Structures, 14-16 Nov. 2011, Kraków, Poland. "Cyclostationary analysis and source separation techniques in health monitoring"
- International Conference on Condition Monitoring, 24-25 Feb. 2011, Visakhapatnam, India, "Overview of some recent signal processing techniques for vibration monitoring"

Member of organizing committees

- President of Survishno, 8-10 July 2019, Lyon, France, (<https://survishno.sciencesconf.org/>)
- President of CS of Surveillance 9, 22-24 May 2017 Fes, Morocco (<https://surveillance9.sciencesconf.org/>)
- Surveillance 8, 20-21 October 2015, Roanne (<http://surveillance8.sciencesconf.org/>)
- President of CS of 4th International Conference on Condition Monitoring of Machinery in Non-Stationary Operations (CMMNO2014), 15-17 December 2015, Lyon, France
- Surveillance 7, 29-30 October 2013, Chartres, France, (<http://surveillance7.sciencesconf.org/resource/page/id/2>)
- President of Surveillance 6, 25-26 October 2011, Compiègne, France (<http://www.utc.fr/surveillance/>)
- President of Summer school "Non-stationary signal processing and inverse problems in acoustics and vibrations", 25-28 June 2012, Ecully, France

Guest editor

- Special issue on "Surveillance conference" in Mechanical System and Signal Processing, Volume 97, December 2017
- Special issue on "Instantaneous Angular Speed (IAS) Processing and Angular Applications" in Mechanical System and Signal Processing (Elsevier), Volume 44, Issue 1-2, February 2014
- Special issue on "Blind Source Separation" in Mechanical System and Signal Processing (Elsevier), Volume 19, Issue 6, November 2005

Invited papers

- R.B. Randall and J. Antoni, "Rolling Element Bearing Diagnostics – A Tutorial", Mechanical Systems and Signal Processing Vol. 25(2), 2011, 485-520 (available online)

- J. Antoni, "Cyclostationarity by Examples", Mechanical Systems and Signal Processing, Volume 23, Issue 4, p. 987-1036, 2009

Invited periods in universities

- Vrije Universiteit Brussel in May 2006, Sept. 2005 and March 2005
- University of New South Wales (Sydney), March 2002, 2003, and 2004

Publication indicators (Scopus January 2021)

- Documents: 232
- *h*-index = 40
- Overall number of citations (since 2002) = 9809 total citations by 4974 documents

Awards

- Nominated for the JSV Doak Prize, 2020
- "Robert Houdin" Prize for the most innovative paper "Principes de moindre action en analyse modale opérationnelle », J. Antoni, S. Chauhan, T. Monnier, K. Gryllias, 3rd Colloque Analyse Vibratoire Expérimentale, 20-21 November 2012, Blois, France
- Best paper award for "Cyclostationarity for Ship Detection Using Passive Sonar: Progress towards a Detection and Identification Framework", David Hanson, Jerome Antoni, Graham Brown and Ross Emslie, presented at the Australian Acoustics Society National Conference, Adelaide, Australia, 23-25 November 2009.
- Student presentation award delivered by the Acoustical Society of America for "Cyclic Sound Intensity and Source Separation from NAH Measurements on a Diesel Engine", Brice Lafon, J. Antoni, M. Sidahmed, L. Polac, Acoustic'08, June 29 - July 4, 2008, Paris.

Editorial activities

Associate editor for:

- Mechanical System and Signal Processing, Elsevier, (<http://ees.elsevier.com/ymssp/default.asp>) since 2008
- Applied Sciences, Section Acoustics (<http://www.mdpi.com/journal/applsci/editors>), since 2017
- International Journal of Condition Monitoring, British Institute of Non-Destructive Testing, (http://www.bindt.org/Publications/IJCM_Journal), 2010-2013
- International Journal of Rotating Machinery, Hindawi, (<http://www.hindawi.com/journals/ijrm/>), 2009-2017
- Diagnostika, ISSN 1641-6414 (Polish scientific journal), since 2009

Patents

- [1] FR3029482 (A1), M. Prevel, O. Sauvage, S. Baudin, J. Antoni, D. Remond, Procédé et dispositif de contrôle de paramètre(s) de fonctionnement d'un groupe motopropulseur générant un acyclisme poduisant un bruit et/ou une vibration, brevet déposé le 08.12.2014, publié le 2016-06-10
- [2] FR3029483 (A1), O. Sauvage, M. Prevel, S. Baudin, J. Antoni, D. Remond, Procédé, dispositif et installation de détermination d'information relatives au fonctionnement d'un groupe motopropulseur présentant un acyclisme, brevet déposé le 08.12.2014, publié le 2016-06-10.
- [3] PCT/FR2014/053352, « méthode de l'état de la route et du pneumatique »
- [4] US2016349219 (A1), A. Paturle, J. Antoni, Method for acoustic detection of the condition of the road and the tire, brevet international déposé le 18.12.2013, publié le 01.12.2016