

Mathieu LAVANDIER
ENTPE - Université de Lyon
3 rue Maurice Audin, 69518 Vaulx-en-Velin Cedex

Research topics

My research aims at understanding and predicting how *sound perception* and (*auditory*) *comfort* are influenced by the surrounding environment, in particular room *reverberation* (the multiple sound reflections on room boundaries), which is mixed with the direct sound from the sources, and modifies the *signal* at the listener's ears. My goal is to study the perceptual effects associated with these modifications, and to propose relevant *acoustical measurements* to describe them. I consider sound perception in terms of *speech intelligibility in noise* and source *localization*. I am also interested in *sound reproduction* in rooms, and I am beginning to investigate the influence of the sound environment on inhabitants' comfort.

I am considering the *auditory system* as a measurement tool allowing an evaluation of intelligibility and *sound quality* - by quality I mean "characteristics" rather than "good" or "bad" - and as a subject of study, in order to understand the complex processing involved while we are listening. My goal is to define acoustical measurements relevant for the improvement of auditory comfort in ordinary rooms, not only in big music halls and amphitheatres. My research can also be applied to *vehicles* and partially closed spaces (stations, streets ...), and to the improvement of *hearing-aids*.

Biography

- Since 2009: Researcher, Laboratoire Génie Civil et Bâtiment, ENTPE (Lyon)
July 2016-January 2017 : Visiting researcher at Macquarie University (Department of Linguistics/National Acoustic Laboratories, Sydney, Australia)
- 2006-2008: Research Associate, School of Psychology, Cardiff University (United-Kingdom)
- 2002-2005: Ph.D in Acoustics, Laboratoire de Mécanique et d'Acoustique (Marseille)
- 2001-2002: MSc in Applied Acoustics, Université du Maine (Le Mans)
- 1997-2000: MSc in Engineering Physics, I.N.P.G. (Grenoble)

Publications

(contact me if you need a reference not available to you)

PEER-REVIEWED JOURNALS

DAVID M., LAVANDIER M., GRIMAUULT N., OXENHAM A.
Discrimination and streaming of speech sounds based on differences in interaural and spectral cues
J. Acoust. Soc. Am., 142 (3), pp. 1674-1685, September 2017 (<http://dx.doi.org/10.1121/1.5003809>)

LECLERE, T., LAVANDIER, M., et DEROCHE, M. L. D. (2017).
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DAVID M., LAVANDIER M., GRIMAUULT N., OXENHAM A.

Sequential stream segregation of voiced and unvoiced speech sounds based on fundamental frequency

Hear. Res., 344, pp. 235-243, February 2017

DEROCHE M. L. D., CULLING J. F., LAVANDIER M., GRACCO V. L.

Reverberation limits the release from informational masking obtained in the harmonic and binaural domains

Atten Percept Psychophys, 79 (1), pp. 363-379, January 2017

VOLK C. P., LAVANDIER M., BECH S., CHRISTENSEN F.

Identifying the dominating perceptual differences in headphone reproduction

J. Acoust. Soc. Am., 140 (5), pp. 3664-3674, November 2016, (<http://dx.doi.org/10.1121/1.4967225>)

BIDART A., LAVANDIER M.

Room-induced cues for the perception of virtual auditory distance with stimuli equalized in level

Acta Acustica united with Acustica, 102 (1), pp. 159-169, January-February 2016

DAVID, M., LAVANDIER, M. and GRIMAUULT, N., 2015,

Sequential streaming, binaural cues and lateralization,

J. Acoust. Soc. Am., Vol.138 (6), pp.3500-3512, December 2015

(<http://dx.doi.org/10.1121/1.4936902>)

TROLLE A., TERROIR J., LAVANDIER C., MARQUIS-FAVRE C., LAVANDIER M.

Impact of urban road traffic on sound unpleasantness: A comparison of traffic scenarios at crossroads

Applied Acoustics, 94, pp. 46-52, July 2015

LECLERE T., LAVANDIER M., CULLING J. F.

Speech intelligibility prediction in reverberation: Towards an integrated model of speech transmission, spatial unmasking and binaural de-reverberation

J. Acoust. Soc. Am., 137 (6), pp. 3335-3345, June 2015 (<http://dx.doi.org/10.1121/1.4921028>)

MICHAUD P.-Y., LAVANDIER M., MEUNIER S., HERZOG P.

Objective characterization of perceptual dimensions underlying the sound reproduction of 37 single loudspeakers in a room

Acta Acustica united with Acustica, 101 (3), pp. 603-615, May-June 2015

DAVID M., LAVANDIER M., GRIMAUULT N.

Room and head coloration can induce obligatory stream segregation (L)

J. Acoust. Soc. Am., 136 (1), pp. 5-8, July 2014 (<http://dx.doi.org/10.1121/1.4883387>)

MICHAUD P.-Y., MEUNIER S., HERZOG P., LAVANDIER M., DROUET d'AUBIGNY G.

Perceptual evaluation of dissimilarity between auditory stimuli: an alternative to the paired comparison

Acta Acustica united with Acustica, 99, pp. 806-815, Sept.-Oct. 2013

COLLIN B., LAVANDIER M.

Binaural speech intelligibility in rooms with variations in spatial location of sources and modulation depth of noise interferers

J. Acoust. Soc. Am., 134 (2), pp. 1146-1159, Aug. 2013 (<http://dx.doi.org/10.1121/1.4812248>)

LAVANDIER M., JELFS S., CULLING J. F., WATKINS A. J., RAIMOND A. P., MAKIN S. J.
Binaural prediction of speech intelligibility in reverberant rooms with multiple noise sources
J. Acoust. Soc. Am., 131 (1), pp. 218-231, Jan. 2012 (<http://dx.doi.org/10.1121/1.3662075>)

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Revision and validation of a binaural model for speech intelligibility in noise
Hear. Res., 275, pp. 96-104, May 2011

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Prediction of binaural speech intelligibility against noise in rooms
J. Acoust. Soc. Am., 127 (1), pp. 387-399, Jan. 2010 (<http://dx.doi.org/10.1121/1.3268612>)

LAVANDIER M., MEUNIER S., HERZOG P.
Identification of some perceptual dimensions underlying loudspeaker dissimilarities
J. Acoust. Soc. Am., 123 (6), pp. 4186-4198, June 2008 (<http://dx.doi.org/10.1121/1.2916688>)

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Speech segregation in rooms: Monaural, binaural and interacting effects of reverberation on target and interferer
J. Acoust. Soc. Am., 123 (4), pp. 2237-2248, Apr. 2008 (<http://dx.doi.org/10.1121/1.2871943>)

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Comparative measurements of loudspeakers in a listening situation
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Speech segregation in rooms: Effects of reverberation on both target and interferer
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Physical and perceptual estimation of differences between loudspeakers
Comptes Rendus Mecanique (Académie des Sciences), vol. 334, n° 12, pp. 732-736, Dec. 2006

OTHER PUBLICATIONS

LECLERE T., THERY D., LAVANDIER M., CULLING J. F.
Speech intelligibility for target and masker with different spectra
van Dijk P., Başkent D., Gaudrain E., de Kleine E., Wagner A., Lanting C. (eds.) Physiology, Psychoacoustics and Cognition in Normal and Impaired Hearing vol. 894 of Advances in Experimental Medicine and Biology, pp. 257-266, 2016.

CULLING J. F., LAVANDIER M., JELFS S.
Predicting binaural speech intelligibility in architectural acoustics
In J. Blauert (ed.), *The technology of binaural listening*, chapter 16. Springer, Berlin–Heidelberg–New York NY, 2013.
Associated Toolbox: <http://amtoolbox.sourceforge.net/doc/speech/jelfs2011.php>

CULLING J. F., LAVANDIER M., JELFS S.
From E-C theory to speech intelligibility in rooms
Buchholz, J. M., Dau, T. Dalsgaard, J. C. and Poulsen, T. (eds.) Binaural Processing and Spatial Hearing (Danavox Jubilee Foundation), 2010.

LAVANDIER M.

Enceintes acoustiques : perception et mesures

Acoustique & Techniques, n° 52, pp. 36-42, 2008

LAVANDIER M.

Différences entre enceintes acoustiques : une évaluation physique et perceptive

Thèse de doctorat, Université de la Méditerranée - Aix-Marseille II, 2005 [<http://tel.archives-ouvertes.fr/tel-00087414>]