



Ph.D.ICEAA

Ph.D. Program in Civil, Building Construction  
and Environmental Engineering

Coordinator: Prof. Marcello Di Risio

## Use of shear wave velocity in geotechnical engineering

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### *Abstract*

The small-strain shear modulus,  $G_{\max}$ , is an important parameter for characterizing the seismic response of deposits to dynamic loading. The parameter is related to shear wave velocity only via the soil density. Laboratory  $V_s$  measurements using the piezoelectric ring-actuator technique, P-RAT, can be incorporated in conventional oedometer cells. Indeed, the piezoelectric ring-actuator technique (P-RAT), is a new technique to measure  $V_s$  in granular material developed and patented at the Université de Sherbrooke.

The seminar provides a detailed description of a unique interpretation method of the signals produced from this technique to minimize the difficulties associated with other techniques. Particular emphasis is also placed on the validation of the accuracy of the P-RAT by means of reliable experimental measurements available in literature.

**13 November 2023 – from 11:30 to 13:00 am**

*Room A-1.4, Monteluco di Roio*

*Online on Teams*

[https://teams.microsoft.com/l/meetup-join/19%3ameeting\\_OW1E2MmYwY2UtMzY4OC00NmM0LTgwZmltYzY2OTE1ZTFmMzhl%40thread.v2/0?context=%7b%22Tid%22%3a%229f08a7c-31d7-4024-9ba6-5ed5efac1a01%22%2c%22Oid%22%3a%22896804bc-c756-4aa3-af19-0ae02ca4bdb9%22%7d](https://teams.microsoft.com/l/meetup-join/19%3ameeting_OW1E2MmYwY2UtMzY4OC00NmM0LTgwZmltYzY2OTE1ZTFmMzhl%40thread.v2/0?context=%7b%22Tid%22%3a%229f08a7c-31d7-4024-9ba6-5ed5efac1a01%22%2c%22Oid%22%3a%22896804bc-c756-4aa3-af19-0ae02ca4bdb9%22%7d)



## *About the Speaker*



Prof. Mourad Karray (Full Professor at Université de Sherbrooke, Canada) is an expert in the characterization of soils by surface waves, dynamic behaviour of soil, liquefaction, and soil-structure interaction.

He was involved in several large-scale projects such as the control of the construction of the Romaine-II dam, Quebec, Canada (Hydro-Quebec) and dynamic analysis of soil foundation of Champlain Bridge (Montréal). Professor Karray is particularly interested in soil characterization methods based on Rayleigh waves which have allowed the development of the MMASW (Multi-Modal Analysis of Surface Waves) technique. This method was used successfully for many important projects in Quebec and elsewhere in the world (Péribonka Dam, La Romaine Dam, Mont-Blanc in France, etc.). He has also contributed to the development of (1) the P-RAT (Piezo-electric-Ring-Actuator-Technique) method for shear wave velocity measurements in the laboratory and (2) the TxSS (Triaxial Simple Shear Test) to evaluate the seismic behavior of soils. He was the recipient of the Prix R.M. Quigley Award in October 2023 for the journal paper entitled “Investigation of small-to large-strain moduli correlations of normally consolidated granular soils” published on the Canadian Geotechnical Journal.