

PhD - Infrared and visible deflectometry for full-field vibration imaging

Record number : OPR-733

Overview

RESEARCH DIRECTION

Olivier Robin, Professeur - Department of
Mechanical Engineering

INFORMATION

olivier.robin@usherbrooke.ca

ADMINISTRATIVE UNIT(S)

Faculté de génie
Département de génie mécanique

LEVEL(S)

3e cycle

LOCATION(S)

Campus principal

Project Description

PROJECT BACKGROUND AND OBJECTIVES: Deflectometry is a rapidly developing vibration imaging technique. Compared to traditional techniques, deflectometry allows to reach remarkable performances, with an improvement of both time- and space- resolutions by important factors (between 10 and 100 depending on the case). The feasibility of infrared deflectometry for dynamic measurements was demonstrated for the first time in 2021 at UdeS. The two objectives of the DÉFIVIB project are (1) to develop the technological readiness level of deflectometry in both visible and infrared domains, and (2) to apply this technique to complex vibroacoustic problems (e.g., identification of the mechanical properties of wood, or the study of structured materials / metamaterials).

ROLES AND IMPLICATIONS: The student will be responsible for combining measurements based on visible or infrared deflectometry with loading and/or material property identification techniques. One of the major objective of this PhD is to work towards the use of deflectometry in a highly multidisciplinary axis. The possibilities already identified concern civil engineering (stresses in conventional or biosourced concrete), materials engineering (ecomposites) or wood for applications in building engineering or guitar crafting. The student will collaborate with graduate students and co-supervise an undergraduate internship. This topic provides an opportunity to develop skills in applied research, vibroacoustics, and camera imaging. It is expected that the Ph.D. will be conducted primarily at the CRASH at the University of Sherbrooke. Free interdisciplinary courses may also be offered through the « Centre Compétences Recherche + ».

Discipline(s) by sector

Sciences naturelles et génie

Génie mécanique

Funding offered

Yes

The last update was on 12 March 2024. The University reserves the right to modify its projects without notice.