LTDS Tribologie et Dynamique des Systèmes UMR 5513

Membre de INSTITUT CARNOT Ingénierie@Lyon

A research fellowship position

Time reversal method for fault detection of Cables

In the framework of the "*pre-maturation NDT-C project*"supported by "*Sci-ty"*, the idea is to detect damages of the bridge cables at their early stages of developments via exploiting the Time Reversal (TR) method [1-4]. The project covers numerical developments and experimental applications.
The successful candidate will carry out three main tasks of the projects:

1. The methodology: design of the test set-up (probs, configurations, excitations, ets) and development of a software for automizing the TR process for real applications.
2. Application of the TR on a cable at the laboratory scale with visible damages. The developed software and designed test set-up at Phase 1 will be exploited, calibrated and re-designed.
3. Application of the TR on the cable with a defined and nonvisible damage created during the fabrication. This phase covers exploitation of data, localization of the damage and possible re-designing of the test set-up.

The profile of the candidate:
The candidate must hold a PhD diploma in applied physics (or Civil/Mechanical Engineering with skills) in the domain of ultrasonic non-destructive testing techniques. A good ability of programming in Matlab is highly appreciated.

Location:
Université de Lyon, ENTPE (https://www.entpe.fr/en), France

The Lab:
The successful candidate will be hosted at the LTDS (https://ltds.ec-lyon.fr/) in the site of the ENTPE.

The supervisor:
Dr. A. Ture Savadkoohi
Email: alireza.turesavadkoohi@entpe.fr
Tel : +33 4 72 04 72 46

How to apply:
Please send a motivation letter and your CV to Dr. Ture Savadkoohi.

Duration and starting date:
The position will start as soon as possible for a duration of 12 months.

References:
[1] Fink M. Time reversal of ultrasonic fields - part I basic principles. IEEE Trans Ultrason. Ferroelectr, Freq Control. 1992;39(5):555–66.
[2] Park HW, Kim SB, Sohn H. Understanding a time reversal process in lamb wave propagation. Wave Motion. 2009;46(7):451–67.
[3] Farin M., Prada C., Lhommeau T., El Badaoui M., de Rosny J. Towards a remote inspection of jet engine blades using time reversal. J. Sound Vib. 2022: 525, 116781
[4] Huguet M., Ture Savadkoohi A., Lamarque C.-H., Collet M. On the damage detection of a metallic beam based on the time reversal principle, Arch. Civ. Mech. Eng. 2025, 25, 84.