LOW COST SYSTEM FOR MEASURING VIBRATIONS THROUGH CAMERAS

PATENTED TECHNOLOGY

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ABSTRACT

A research group of the University of Alicante has developed a low-cost technique to measure the frequency of small-amplitude vibration movements.

The method is based on high-speed video acquisition and can be easily implemented with a low-end video camera. It allows simultaneously analysing different regions in one scene and even obtaining a vibration map of the whole scene. Furthermore, it is not limited to a single-point measurements allowing simultaneous analysis of complex object with different moving parts.

The technique is easy to implement and avoids using contact probes, wired systems or laser beams pointing to an object.

ADVANTAGES AND INNOVATIVE ASPECTS

MAIN ADVANTAGES OF THE TECHNOLOGY

- Non-contact vibration measuring technique
- No need of using external elements like targets, wired devices, physical probes or optical beams
- Simple and economic setup composed of a low-end camera, and a standard computer.
- Fast and robust.
- Can measure macroscopic and microscopic vibrating objects.
- Simultaneous vibration measurement of different regions and different vibration modes (vibration map)

INNOVATIVE ASPECTS

Among the current methods for measuring vibrations, accelerometers are traditionally preferred. Nevertheless, these methods are contact devices, which may be difficult to use when the specimens not accessible due to the object itself or the surrounding conditions (inaccessibility, damage risk, etc.).

Alternatively to the accelerometers, Doppler vibrometers are often used as non-contact devices. Although they provide very accurate result, they result expensive and non-cost effective for many applications.

Additionally, both of them only provide a single point measurement while our method permits, not only monitoring the process but, with the vibration map, obtaining the vibration frequencies of all vibrating objects in the scene at a glance.

MARKET APPLICATIONS

The method can be applied to any field where non-invasive vibration movement and vibration measurements are needed. In particular we suggest acoustics, building, biotechnology, entertainment devices, maintenance, security and surveillance.

We have successfully tested the method in structural engineering and we are actually developing the software for high frequency eye movement detection, which is of fundamental importance in neurology.

COLLABORATION SOUGHT

The research group is looking for companies acquiring this invention for commercial agreement, technical assistance, manufacturing agreement, technical cooperation or a combination of some of these services.