

Nondestructive Evaluation of Layered Media with Application to Pavement Infrastructure

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ABSTRACT

Nondestructive evaluation of civil infrastructure is of critical importance for their quality assurance at the time of construction, and condition monitoring as they age. Pavements are a critical part of the country's infrastructure and are crucial for the transport of goods and people. Although only the top layer of the pavement is visible, they are multilayered structures with all the layers playing a crucial role in the performance of the pavement. It is important to estimate the mechanical properties of all the pavement layers as the pavements age to estimate the remaining service life as well as design necessary rehabilitation measures. Nondestructive evaluation of pavements using surface wave propagation is an efficient technique to estimate the individual layer properties of the system. In this talk, I will discuss the three important aspects of nondestructive evaluation of layered systems using surface waves in general and then present its application for a pavement system. The three main steps involved in the NDE of layered systems are; (i) Conducting experiments to record the pavement surface response due to an external source, (ii) Wave propagation modelling aspects of layered media through semi-analytical finite element (SAFE) method and (iii) Inversion procedure to back-calculate the individual layer properties.

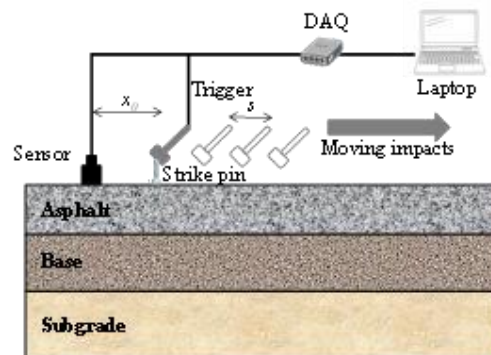


Figure: Typical pavement NDE schematic

ABOUT THE SPEAKER

Dr. Vivek Samu is an Inspire Faculty in the Civil Engineering department at IISc. He got his bachelor's from NIT Trichy, and a master's and Ph.D. from North Carolina State University (NCSU), USA. His research areas broadly include the application and development of wave-based non-destructive evaluation techniques for civil infrastructure and materials.



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