

DATA PREPARATION AND COMPUTATION FOR PAVEMENT MACRO-TEXTURE WITH 1MM 3D LASER IMAGES

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ABSTRACT

In the recent year, technology based on high-resolution 3D laser imaging has become a new direction of development for automated pavement condition survey. This paper presents preliminary methods that can be used to exploit the 3D data for surface texture measurement, particularly for macro-texture measurement. Procedures to validate 3D data points are introduced to improve data quality. Subsequent new computation methods are presented for calculating indices of macro-texture. Mean Profile Depth (MPD) as defined in ASTM standard E1845 and the Mean Texture Depth (MTD) based on the traditional volumetric method are bases for the computational experiments in the paper. Even though the presented materials are preliminary in nature and substantial more work needs to be conducted, the potential to use complete lane-wide 3D pavement surface at 1mm resolution for comprehensive analysis of surface characteristics is demonstrated. It is clearly demonstrated in the paper that full-lane virtual pavement at sufficient resolution provides opportunities in better models for pavement surveys. It is envisioned that revised standards for compiling pavement surface data may be needed in the future to accommodate the high-performance 3D technology to better model pavement surface characteristics.

KEY WORDS: Pavement macro-texture, 3D imaging, pavement surface characteristics