

EXPOSING SYSTEM AND MODEL DISPARITY AND AGREEMENT USING WAVELETS

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ABSTRACT

Model verification and validation (V&V) remains a critical step in the simulation model development process. A model requires verification to ensure that it has been correctly transitioned from a conceptual form to a computerized form. A model also requires validation to substantiate the accurate representation of the system it is meant to simulate. Validation assessments are complex when the system and model both generate high-dimensional functional output. To handle this complexity, we review several wavelet-based approaches for assessing models of this type and introduce a new concept for highlighting the areas of contrast and congruity between system and model data. This concept identifies individual wavelet coefficients that correspond to the areas of discrepancy between the system and model. This validation method will be used to aid the Air Force Research Laboratory's (AFRL) Integrated Vehicle and Energy Technology (INVENT) program, which seeks to develop a robust model-based design method for next generation aircraft.

Keywords: Validation, wavelets, thresholding, WANOVA