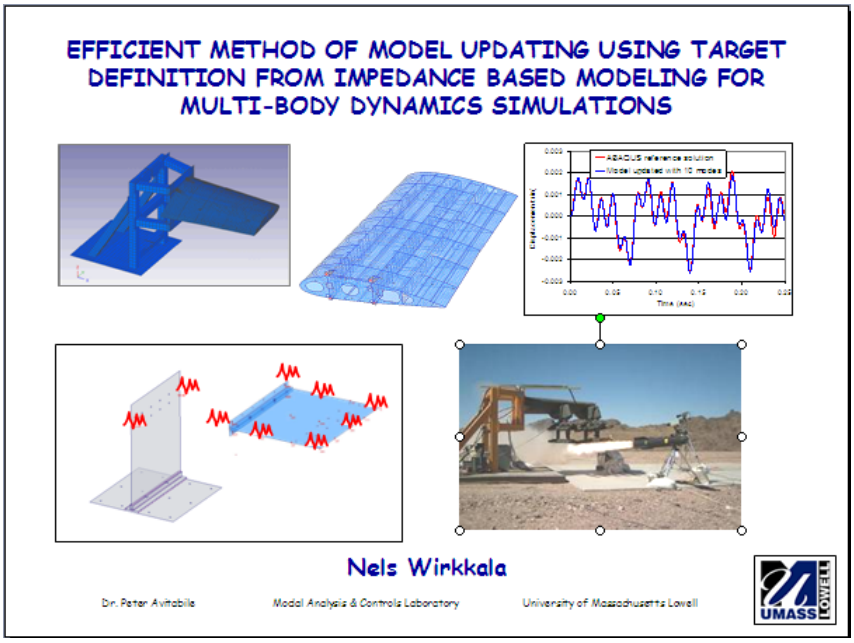
MASTER'S THESIS – NELS WIRKKALA

EFFICIENT METHOD OF MODEL UPDATING USING TARGET DEFINITION FROM IMPEDANCE BASED MODELING FOR MULTI-BODY DYNAMICS SIMULATIONS



Multi-body dynamics simulations are commonly used to predict the characteristics of an assembly of rigid and/or flexible components. The flexible components originate from finite element models which must be validated and updated using experimental modal data. This updating process can be computationally intensive and time consuming. Methods of generating accurate models more efficiently for use in the simulations are needed.

This work describes an alternate approach of generating accurate finite element models for multi-body dynamics simulations. The method combines the techniques of model reduction, direct model updating, and frequency-based substructuring (FBS), to transform a reduced-order, "free-free" component of an assembly into a model which contains the flexibility of the full physical structure. In this study, a finite element model of an aluminum plate is modified using target information from FBS such that the updated model has the flexibility and dynamic characteristics of a larger assembly.

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