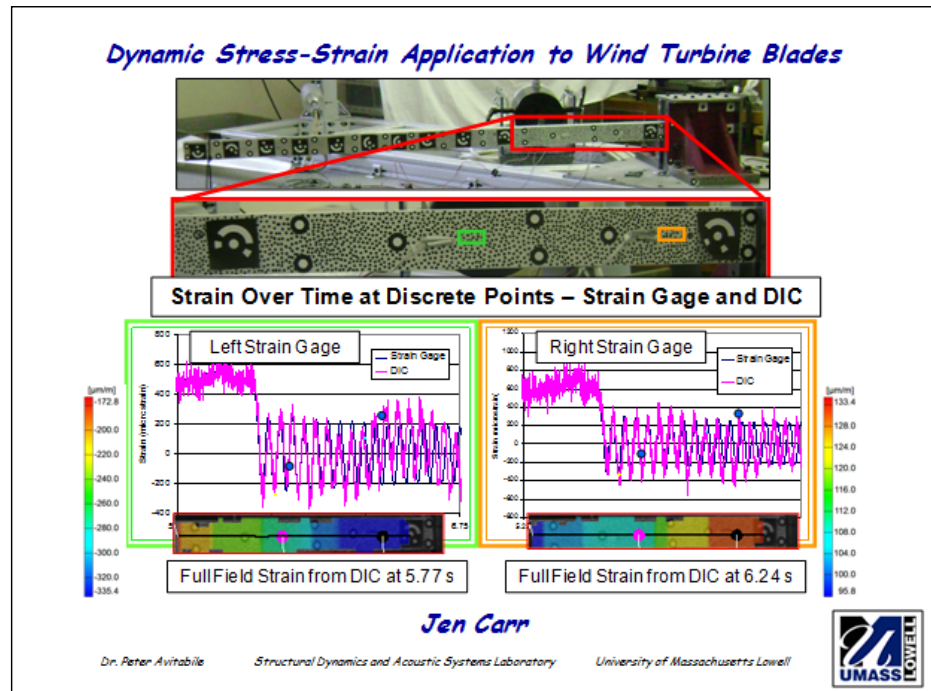## MASTER'S THESIS – JENNIFER CARR

DYNAMIC STRESS-STRAIN PREDICTION FROM MEASURED DATA FOR WIND TURBINE APPLICATIONS

Often times, wind turbine blades are subjected to static and dynamic testing to identify the performance levels that can be achieved for a particular configuration. Many times only a handful of strain gages are deployed to capture that information.

The first part presents the static strain measurements and calibration of the system overall. The strain distribution obtained by using digital image correlation (DIC) along the length of the beam is compared to discrete strain gage measurements and with a finite element model. The second part presents DIC techniques to identify the full-field stress-strain on the turbine blade during dynamic testing. Comparison of the full-field stress-strain and the conventional strain gages are presented to show the usefulness of the image correlation approaches.

Peter_Avitabile@uml.edu   *Christopher_Niezrecki@uml.edu*   *Murat_Inalpolat@uml.edu*   *Zhu_Mao@uml.edu*