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Experimental stress analysis

Moiré interferometry

Luminescent photoelastic coatings

Composite materials and fabrication techniques

Micro air vehicles

Historically, experimental stress analysis (ESA) has been an important step in the design cycle for mechanical components. Increasing reliance on numerical predictions has changed the role of ESA towards validation and calibration of numerical models. We are developing advanced methods to perform stress analysis and incorporate the results to aid the designer. Novel ESA methods have been developed including high sensitivity moiré interferometry and luminescent coatings. These methods have been applied to a variety of materials and structures, especially composite materials.

Micro air vehicles (MAVs) are small flying machines that, in the future, will perform surveillance, sensing, and delivery in both the military and civilian environment. The University of Florida leads the world in research of structures, aerodynamics, control, and flight testing of MAVs. In fact, the University of Florida has won the International Micro Air Vehicle Competition the last five years.



Selected Publications

- Ettinger, S.M., M.C. Nechyba, P.G. Ifju and M. Waszak. 2003. Vision-guided flight stability and control for micro air vehicles. *Advanced Robotics* (invited).
- Ifju, P.G., D.A. Jenkins, S. Ettinger, Y. Lian, W. Shyy and M.R. Waszak. 2002. Flexible-wing-based micro air vehicles. *AIAA Annual Conference*, AIAA 2002-0705. (Outstanding Paper)
- Ifju, P.G., S. Ettinger, D.A. Jenkins and L. Martinez. 2001. Composite materials for micro air vehicles. *SAMPE Journal* 37(4). (Outstanding Paper)
- Chen, L., B.V. Sankar and P.G. Ifju. 2001. A novel double cantilever beam test for stitched composite laminates. *J. Composite Materials* 35(13):1137-1149.
- Ifju, P.G., B.C. Kilday, X. Niu, S.C. Liu and S. Ettinger. 2000. Residual strain measurement in composites using the cure referencing method. *Experimental Mechanics* 40(1): 22-30.
- Post, D., B. Han and P.G. Ifju. 1994. *High Sensitivity Moire, Experimental Analysis for Mechanics and Materials*. New York: Springer Verlag Mechanical Engineering Series.