

Senior Design Projects 2007

Testing Facility for Fatigue Delamination

James Frank, Jeremy Hay, Shaun Reeb, and Jeff Speed

The main objective of this project is to fabricate an experimental setup for testing delamination under fatigue loading on unidirectional carbon-epoxy composite laminates. Experiments are conducted under varying mixed-mode conditions. In this project, a special variable mix mode test-rig has been fabricated to use with an existing vibration shaker system for fatigue-type loading of composites.

Process Control Trainer

Eli Wallace and Andrew Kissel

The Process Control Trainer project is designed to assist students in learning PID control using Ziegler-Nichols tuning. The process data will be collected and sent to distance students in real-time via the Internet. With the data collected, the students are able to display the accompanying charts and graphs of the process as well as calculate all variables needed for PID control.

F.I.R.S.T. Robotics

Susan Pandin, A.J. Lipps, and Anthony Williamson

This group used their Miami University experience to help mentor Lakota East High School students build and compete with a robot for the FIRST Robotics competition at the regional and national level. The Miami students have been involved in all aspects of the project, including design and fund raising. This year's team was named First Robotics team 1038, the Thunder Hawks. The robot game for 2007 was called Rack 'n Roll. The field consisted of a 10 foot rack made of swinging pipes and chains. The object of the game is to hang as many inner-tubes as possible on the swinging pipes to score the most points. The robot stands five feet tall and weighs approximately 100 lbs.

Interfacing a Process Control Trainer to the Web

Derrick Tucker and Nathan Webb

This team is modifying existing laboratory equipment used to familiarize students with fluid process control. The focus is to interface a fluid process trainer to the Internet using a data acquisition card, TCP/IP, and Labview. Distance sites will be able to monitor process variables and manipulate parameters to achieve PI control of the process.

Remote Adjustable Variable Orifice Plate

Joe Powers and Vernon Smith

An aero-derivative turbine engine at General Electric requires several manually controlled variable orifice plates to assist in the control of the air pressure exerted on the thrust mount bearings in the engine. The adjustment of these orifice plates is necessary to extend bearing life and is performed by shutting down the engine and manually adjusting the orifice plates to the desired opening. This team has designed a new remotely adjustable variable orifice plate. Some of the features include control by a linear actuator with a digital readout, a new orifice opening with adjustment capability in one thousandths of an inch, and thermo-electric panels. The adjustment readout is interfaced to a Labview program.

Mar-Test

Tom Houtz and Dwayne Platt

This team designed and built a material tester for Mar-Test Corporation. The unit will be used by the sales team to demonstrate Mar-Test's material testing capabilities. Considerations in the design include load cell interfacing to LabView and proper material selection for demonstration purposes.