Composites Manufacturing & Simulation Center

REBECCA CUTTING

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Validation Engineer, Composites Manufacturing and Simulation Center

Purdue University, West Lafayette, IN (August 2016–present)

Currently researching noise and vibration analysis methods for automotive industry and how they can be applied to parts made of composite materials. Primarily interested in structural dynamic test and analysis correlation, and how composite manufacturing methods and materials affect dynamic performance and properties. Responsible for validating commercial software packages using industry standard test methods.

Structural Dynamics Test Engineer

The Boeing Company Structural Dynamics Lab, Seattle, WA (May 2013-August 2016)

Worked as a lab test intern the summers of 2013 and 2014; full time employee starting in June 2015. Planned, coordinated, and executed a variety of structural dynamic tests including ground vibration tests, flutter tests, operational modal analysis tests, and impact tests. Specialized in flutter testing for the structural dynamics lab, responsible for preparation of data acquisition and analysis systems in flutter testing. On team to convert to digital data acquisition in telemetry room for flutter flight testing. Gained significant experience with high speed dynamic data acquisition hardware, large scale test setups, and modal parameter estimation. Notable projects include 737MAX flutter testing, KC-46A airplane flutter testing, KC-46A boom flutter testing, 747-8I flutter testing, 737MAX ground vibration test, and P-8 Poseidon full rate production ground vibration test.

Graduate Research Assistant

Purdue University, West Lafayette, IN (August 2013–May 2015)

Researched the effect of microstructure variability in discontinuous fiber parts on dynamic properties. Modeled compression molded parts made with thermoplastic prepreg chopped into ½" square platelets. Applied micromechanical material models to the complex and variable microstructure of theoretical parts to predict range of dynamic properties. Used modal assurance criterion (MAC) and coordinate modal assurance criterion (COMAC) to evaluate changes in dynamic properties from microstructure variability.

Engineering Co-op Student

ATA Engineering Inc., San Diego, CA (August 2009–August 2012)

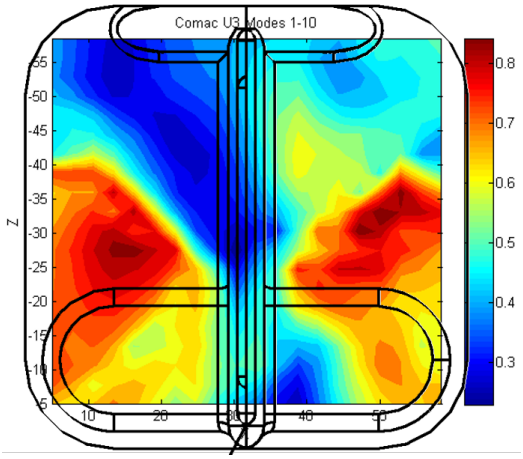
Completed a 5-term co-op with ATA Engineering. Learned advanced finite element modeling and simulation techniques. Gained experience in modal analysis, stress analysis, and response simulation in a variety of commercial FEA codes. Focused on dynamic simulations for component and aerospace systems. Learned basics of statistical energy analysis and implemented knowledge in launch analyses for spacecraft using VA One.

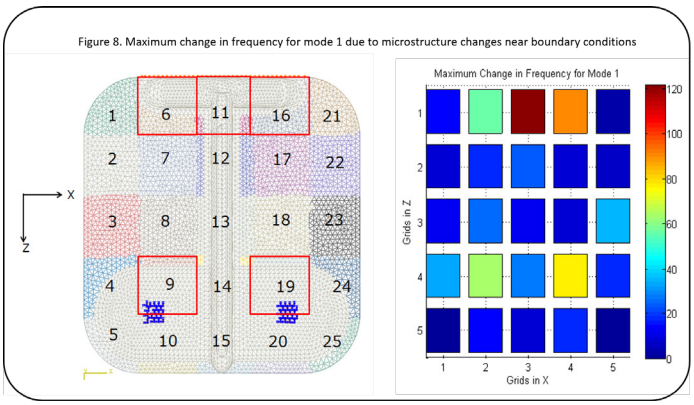
Teaching Experience

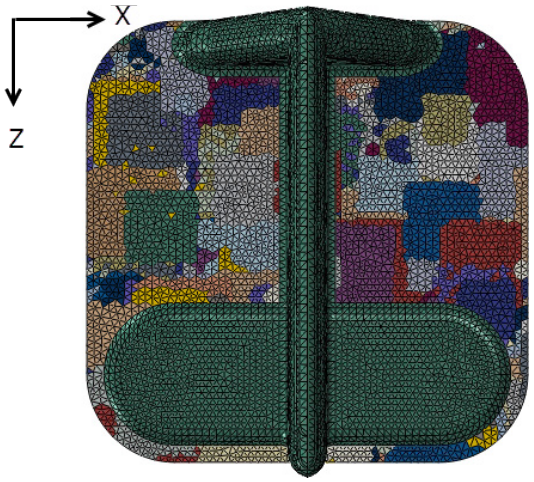
Graduate Teaching Assistant, Purdue University, West Lafayette, IN (August 2013-May 2015)

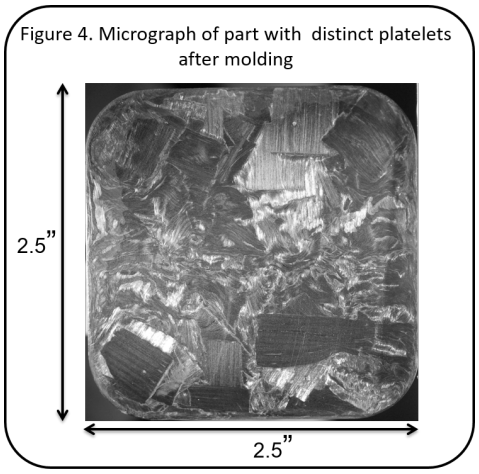
Teaching assistant for Mechanics of Materials, Structural Analysis I, Characterization of Advanced Composite Materials, and Mechanics of Composites. Created quizzes, homework problems, and homework solutions for undergraduate structures classes. Lectured on topics such as structural dynamics, superposition of beam solutions, and shear flow. Instructed students on use and purpose of lab equipment for testing of composites.

Figures









Publications

Cutting, Rebecca. (2015). Considerations for Nondestructive Evaluation of Discontinuous Fiber Composites Using Dynamic Analysis. (Master’s thesis). Retrieved from ProQuest LLC.

Research Interests

- Structural dynamic testing and analysis techniques for composite materials
- Structural dynamic test and analysis correlation
- Dynamic properties of variable microstructure parts

Skills

- Computer Programming: Java, Matlab, Fortran, C, LaTEX, Python, Bash, Visual Basic
- Computer Graphics and Analysis Software: CATIA, NX, VAOne, FEMAP, I-deas, Abaqus, NASTRAN, X-Modal
- Familiar Hardware: VTI CMX chassis series with EMX series cards, VTI PMX09 integrated data acquisition controller and computer, SLICE Micro and SLICE PRO Data Acquisition Systems, VXI bus with VTI 143X series cards, Polytec PSV-400 Scanning Laser Vibrometer