

HENG LIU

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EDUCATION

University of Missouri, Rolla

December 2012

M.S. in Manufacturing Engineering

GPA: 3.75/4.0

Thesis: *Numerical Analysis of Thermal Stress and Deformation in Laser Metal Deposition Process*

Southwest Jiaotong University

July 2011

B.E. in Mechanical Engineering

Rank: 1/368, GPA: 3.8/4.0

QUALIFICATIONS

Computer

MATLAB, Python, Fortran, Windows/Linux, MS Office/L^AT_EX

CAE/CAD

Hypermesh/TSV/Simlab, Abaqus, Ansys, FEMFAT, CATIA

Language

English, Mandarin

EXPERIENCE

Ford Motor Company

March 2014 - Present

Durability CAE Engineer

Livonia, MI

- Conducted various types of analysis based on finite element method including: stress & strain, displacement, fatigue & fracture, contact problems, coupled thermo-mechanical problems, and topology/shape/size optimization.
- Collaborated with component/system engineers to provide design direction and resolve lunch issues based on results obtained from CAE analysis.
- Developed numerical tools (scripts, subroutines, etc.) for CAE pre/post-processing, numerical simulation and mathematical optimization.

University of Missouri, Rolla

January 2012 - December 2013

Graduate Research Assistant

Rolla, MO

- Boeing and Rolls-Royce Research Project - Material Behavior Prediction and Validation
 - Developed coupled thermo-mechanical finite element models to study the stress, strain, and deformation of materials during laser deposition process.
 - Conducted experiments to validate the temperature field simulation with infrared camera and the deformation of substrate with laser displacement sensor.
 - Optimized process parameters with DOE methods to reduce the residual stress within laser manufactured parts.
 - Made quarterly presentations to industry partners and prepared final project reports.
- Finite Element Analysis (ME312, ME408) Course Projects
 - Investigated the stress distribution in a pressure vessel under thermal and mechanical loadings.
 - Analyzed the frequency and mode shape of a water tower with solid and pipe cross sections.
 - Studied the stress distribution in a thin-walled cylinder undergoing concentrated cutting force.
- Applied Computational Methods (ME 330) Course Projects
 - Developed MATLAB codes for numerical solutions of linear and nonlinear equations, numerical interpolation and polynomial approximation, gradient-based optimization, and numerical differentiation and integration.

- Six Sigma Course Project (Emgt 309) - Hydraulic Leak Reduction
 - Analyzed the variables that exist in the hydraulic assembly lines at John Deere which are not controlled or monitored; identify all the possible risks involved in the assembly operations using Process Failure Mode Effects Analysis (PFMEA) method.
 - Developed a new mistake proofing assembly method that will achieve robust process control by eliminating possibilities for the operators to bypass a defective subassembly.

Eastsun Oilfield Equipment Manufacturing Co.

August 2011 - December 2011

Intern

Wuxi, Jiangsu, China

- Created and modified 2-D drawings and 3-D models of pipes and fittings.
- Collected and helped to analyze tolerance data to improve product quality.
- Assisted in documentation and maintenance of product drawings during the API certification assessment.

Southwest Jiaotong University

March 2011 - July 2011

Undergraduate Research Assistant

Chengdu, Sichuan, China

- Analyzed the structure principle and working characteristics of Continuously Variable Transmission (CVT) in Fendt Vario 900 series tractors; studied the hydraulic power diversion ratio using AMESim.
- Designed a special bed with proper control systems to secure users when earthquake occurs; created a simulation of the process with Ansys; fabricated and assembled the bed with team members.

PUBLICATIONS

1. Liu H, Sparks T, Liou F: **Numerical Analysis of Thermal Stress and Deformation in Multi-Layer Laser Metal Deposition Processes**. Proceedings of Solid Freeform Fabrication Symposium, Austin, TX, 2013.
2. Zhang J, Liou F, Fan Z, Liu H: **Probabilistic Simulation of Solidification Microstructure Evolution during Laser-Based Metal Deposition**. Proceedings of Solid Freeform Fabrication Symposium, Austin, TX, 2013.
3. Liu T and Liu H: **The Analysis of Fendt Vario 900 Tractor Transmission System**. Machine Tool & Hydraulics 15 (2011): 034.

HONORS & ACTIVITIES

- University of Missouri Rolla Council of Graduate Students - Secretary
- Ministry of Education of China – National Scholarship (Top 1 %, Multiple years)
- Southwest Jiaotong University Si Shi Yang Hua Golden Medal Winner (Top 0.5 ‰)
- Southwest Jiaotong University First Prize Scholarship (Top 5 %, Multiple years)
- Ministry of Education of China National Mechanical Design Competition - 2nd Prize