HENG LIU

www.hengliu.us
39619 Tuscany Ct ◇ Novi, MI 48375
(573) · 612 · 8158 ◇ liuheng1208@gmail.com

EDUCATION

University of Missouri, Rolla *December 2013*
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

CAE/CAD	Hypermesh/TSV/Simlab, Abaqus, Ansys, FEMFAT, CATIA
Programming	Python, MATLAB, Fortran
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. Wang Z, Liu R, Sparks T, Liu H, Liou F: **Stereo vision Based Hybrid Manufacturing Process for Precision Metal Parts**. Precision Engineering (2014).
2. 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.
3. 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.
4. Liu T and Liu H: The **Analysis of Fendt Vario 900 Tractor Transmission System**. Machine Tool & Hydraulics 15 (2011).

HONORS & ACTIVITIES

- Ford Motor Company – TDE Monthly Technical Achievement Award
- University of Missouri Rollla Council of Graduate Students - Secretary
- Ministry of Education of China – National Scholarship (Top 1 %, Multiple years)
- Southwest Jiaotong University Si Shi Yang Hua Medal Winner (Top 0.05 %)
- Southwest Jiaotong University First Prize Scholarship (Top 5 %, Multiple years)
- Ministry of Education of China National Mechanical Design Competition - 2nd Prize