Yanfei Lu

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EDUCATION

Georgia Institute of Technology (Ph.D) 5/2016-8/2019

Ph.D. in Mechanical Engineering

Research Area: Intelligent Manufacturing, Diagnostics and Prognostics of Machine Systems

- Data analysis, signal processing for noise reduction, feature extraction and forecast of trend
- Assist manufacturer developing intelligent online diagnostic model for monitoring bearing degradation

Advisor: Dr. Steven Y. Liang

Lab: Georgia Tech Precision Machining Research Center

GPA: 3.86/4.00

Georgia Institute of Technology (Undergrad) 1/2012-5/2015

B.S. in Mechanical Engineering (Highest Honor)

Research Area: Subtractive Machining Technology

- Manufacturing process selection and cutting tool selection

GPA: 4.00/4.00

University of Illinois Urbana-Champaign (Undergrad) 8/2010-12/2011

B.A. in General Studies

WORK EXPERIENCE

Pressio Spine Inc. Atlanta, GA 1/2019-Present

Title: Shareholder

FEA for shape memory implant geometry design using superelasticity on ANSYS workbench
FEA for Nitinol deployment device design using elastic-plastic model for Stainless Steel 17-4PH
Simulate the ASTM F1717 through FEM to compare design performance with predicates for FDA clearance
CT scanning of implants and generate part files for mechanical simulation
Mechanical test development for implant performance testing (Bending stiffness, Torsional stiffness, Pull-out)
Work with EDM vendor to develop and optimize implant manufacturing processes

DDM GA LLC. Atlanta, GA 3/2018-Present

Title: Owner

Help local medical startup companies facilitate design process and improve product manufacturability
Rapid machining service to produce implants prototype, test fixture, and other machine components
FEA simulation for product geometry optimization
Strain analysis and image processing using MATLAB

MedShape Inc. Atlanta, GA 8/2012-Present

Title: Manufacturing Engineer and Simulation Engineer

- **DynaNail Mini (Subtalar fusion device, Charcot beam)**

Conceptual design of subtalar fusion products
Used FEA to evaluate implant performance within human feet
Managed in-house production
Managed project activities with contracted manufacturer
GD&T analysis, FMEA for implant and deployment device

- **DynaClip (Bone staple)**

Optimized shape memory alloy design using superelasticity model of Nitinol
FEA of the ASTM F564 to clear shape memory implant with FDA
Analyzed product cost with considerations of different manufacturing processes

- **DynaNail (Ankle arthrodesis device)**

Designed, prototyped, manufactured and tested CFR-PEEK implant frame components
Machining fixture design
Worked with sales and marketing department to explore market overseas

- **FastForward (Bunion repair device)**

Designed and manufactured tenodesis screw and instrumentation using CAD and CAM
Created design validation test protocol

- **X-wing (Hammertoe repair device)**

Designed and manufactured implant and instrumentation using CAD and CAM

Vertera Spine. Atlanta, GA 6/2015-5/2016

Title: Manufacturing Consultant, Process Engineer

Solved problems of implants' defect during manufacturing process
Improved production rate by optimizing the manufacturing and assembly processes
CNC programming for implant machining
Built porous peek processing machine components

Colson Group USA. Newnan, GA 9/2015-1/2016

Title: Drafter, Test Engineer

Created drawing and models for caster products using SolidWorks
Managed product lifecycle tests

McKinsey Capability Center. Atlanta, GA (Part Time) 12/2014-2/2015

Title: DtV Lab Technician

Collected consumer feedbacks to improve products

PUBLICATIONS

Journal Articles:

1. **Lu, Y.**, Rajora, M., Zou, P., & Liang, S. (2017). Physics-embedded machine learning: case study with electrochemical micro-machining. Machines, 5(1), 4. doi: 10.3390/machines5010004, 2017.
2. **Lu, Y.**, Li, Q., Pan, Z., & Liang, S. Y. (2018). Prognosis of bearing degradation using gradient variable forgetting factor RLS combined with time series model. IEEE Access, 6, 10986-10995. doi: 10.1109/ACCESS.2018.2805280, 2018.
3. **Lu, Y.**, Li, Q., & Liang, S. Y. (2018). Physics-based intelligent prognosis for rolling bearing with fault feature extraction. The International Journal of Advanced Manufacturing Technology, 97(1-4), 611-620. doi: 10.1007/s00170-018-1959-0, 2018.
4. **Lu, Y**., Xie, R., & Liang, S. Y. (2018). Detection of weak fault using sparse empirical wavelet transform for cyclic fault. The International Journal of Advanced Manufacturing Technology, 99(5-8), 1195-1201. doi: 10.1007/s00170-018-2553-1, 2018.
5. **Lu, Y.**, Pan, Z., Bocchini, P., Garmestani, H., & Liang, S. (2019). Grain size sensitive–MTS model for Ti-6Al-4V machining force and residual stress prediction. The International Journal of Advanced Manufacturing Technology, 1-9. https://doi.org/10.1007/s00170-019-03309-w
6. **Lu, Y.**, Xie, R., & Liang, S. Y. (2018). Adaptive online dictionary learning for bearing fault diagnosis. The International Journal of Advanced Manufacturing Technology, 1-8. The International Journal of Advanced Manufacturing Technology (SCI Archived), pp. 1-8, doi: 10.1007/s00170-018-2902-0, 2018.
7. **Lu, Y.**, Xie, R., & Liang, S. Y. (2019). Bearing Fault Diagnosis with Nonlinear Adaptive Dictionary Learning. The International Journal of Advanced Manufacturing Technology. 1-13. https://doi.org/10.1007/s00170-019-03455-1
8. **Lu, Y.**, Xie, R., & Liang, S. Y. (2019). Extraction of Weak Fault Using Combined Dual-Tree Wavelet and Improved Morphological Component Analysis for Rolling. The International Journal of Advanced Manufacturing Technology. DOI: 10.1007/s00170-019-04065-7
9. **Lu, Y.**, Xie, R., & Liang, S. Y. (2019). CEEMD Assisted Bearing Degradation Assessment Using Tight Clustering. The International Journal of Advanced Manufacturing Technology.
10. **Lu, Y.**, Xie, R., & Liang, S. Y. (2019). Bayesian Optimized Deep Convolutional Network for Electro-Chemical Drilling Process. Journal of Manufacturing and Materials Processing
11. **Lu, Y.**, Wang, Z., Xie, R., & Liang, S. Y. (Under review). Bayesian Optimized Deep Convolutional Network for Bearing Diagnosis. The International Journal of Advanced Manufacturing Technology

Conference Papers:

12. **Lu, Y.**, Li, Q., & Liang, S. Y. (2017). Adaptive prognosis of bearing degradation based on wavelet decomposition assisted ARMA model. In 2017 IEEE 2nd Information Technology, Networking, Electronic and Automation Control Conference (ITNEC) (pp. 733-736). IEEE. doi: 10.1109/ITNEC.2017.8284829

13. Eaves, F. F., Kazmer, D. O., Knight, G., Dietz, T., Griffin, D., **Lu, Y.** (2018). BRIJJIT Force Modulating Tissue Bridges: Update and Strain Analyses. American Society for Aesthetic Plastic Surgery Annual Meeting 2018
14. Liang, S. Y., **Lu, Y.,** Xie, R. (2019). Intelligent Diagnosis and Signal Processing of Vibration Signal from Rotating Machinery (ASPAI 2019)

TEACHING EXPERIENCE

Georgia Tech. Atlanta GA 5/2019-8/2019
Title: Part Time Instructor for ME 3180 Machine Design
Educated students on the fundamentals of design disciplines
Introduced students to various mechanical components and material properties

Georgia Tech. Atlanta GA 1/2019-5/2019
Title: Graduate Teaching Assistant for ME 3057 Experimental Method
Educated students on experimental methods through mechanical, vibration, acoustic labs

Georgia Tech. Atlanta GA 8/2018-12/2018
Title: Full Time Instructor for ME 3210 Design and Manufacture
Educated students on the fundamentals of design and manufacturing processes
Combined industrial experience to educate students on the most advanced process and technologies
Organized students' training on CNC machining process

Georgia Tech. Atlanta GA 1/2018-5/2018
Title: Teaching Practicum for ME 3180 Machine Design
Lectured students on spring and shaft component design and related analysis

Georgia Tech. Atlanta GA 1/2015-5/2015
Title: Shell Tutor for ME 3180 and ME 3210 Design and Manufacture
Held office hours to help students on in-class questions related to machine design and manufacturing
Prepare exam reviews for students

SKILLS

Machining: CNC Machine Operation and Programming (Mazak 5-axis Lathe, Okuma 2-axis Lathe, HAAS 2-axis Lathe, HAAS 4-axis Mill, Chevalier Surface Grinder)
Instrumentation: Instron 5567, Waterjet, Brown&Sharpe Coordinate Measure Machine, Oscilloscope, Function Generator, Tool makers microscope, MyDAQ
CAD/CAM/FEM: SolidWorks, ANSYS, Abaqus, MasterCAM, ProE, Gibbs Cam, Autodesk Fusion 360
Testing: Tensile test, bending test, cyclic test, ASTM F564, ASTM F1717
Software: MATLAB, R, Labview, Python, Basic C++
Languages: English, Chinese
Certificates: Six Sigma Green Belt (IISE), FDA Quality System CFR 820, OSHA Bloodborne Pathogens Training, Sandvik Metal Cutting Technology E-learning

MANAGEMENT COURSES

MGT 6000: Financial and Managerial Accounting
MGT/ME 6789: Technology Ventures

ACTIVITIES&HONORS

Reviewer of AIME (Advances in Mechanical Engineering) 2018-Present
Reviewer of IJPEM (International Journal of Precision Engineering and Manufacturing) 2017-Present
Reviewer of MDPI (Sensors) 2017–Present
Institute of Electrical and Electronics Engineer (IEEE) 2017-Present
Institute of Industrial and Systems Engineers (IISE) 2017-2018
Georgia Tech Highest Honor 5/2015
Georgia Tech ASME Member, Atlanta, GA 1/2014-5/2015
Faculty Honors, Atlanta, GA 2012&2014&2015
Pi Tau Sigma Honor Society, Atlanta, GA 11/2012-5/2015