Yanfei Lu

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EDUCATION

Georgia Institute of Technology (Ph.D) 5/2016-8/2019
Ph.D. in Mechanical Engineering GPA: 3.86/4.0

Georgia Institute of Technology (Undergrad) 8/2010-5/2015
B.S. in Mechanical Engineering (Highest Honor) GPA: 4.0/4.0
Transferred from University of Illinois Urbana-Champaign in 2012

PUBLICATIONS

Total Publications: 16

Journal Articles:

- **Lu, Y.**, Rajora, M., Zou, P., & Liang, S. Y. (2017). Physics-embedded machine learning: case study with electrochemical micro-machining. *Machines*, *5*(1), 4.
- **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.
- **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), 611-620.
- **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), 1195-1201.
- **Lu, Y.**, Xie, R., & Liang, S. Y. (2019). Adaptive online dictionary learning for bearing fault diagnosis. *The International Journal of Advanced Manufacturing Technology*, *101*(1), 195-202.
- **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
- **Lu, Y.**, Xie, R., & Liang, S. Y. (2019). Bearing fault diagnosis with nonlinear adaptive dictionary learning. *The International Journal of Advanced Manufacturing Technology*, *102*(9), 4227-4239.
- **Lu, Y.**, Xie, R., & Liang, S. Y. (2019). Extraction of weak fault using combined dual-tree wavelet and improved MCA for rolling bearings. *The International Journal of Advanced Manufacturing Technology*, *104*(5), 2389-2400.
- **Lu, Y.**, Xie, R., & Liang, S. Y. (2019). CEEMD-assisted bearing degradation assessment using tight clustering. *The International Journal of Advanced Manufacturing Technology*, *104*(1), 1259-1267.
- **Lu, Y.**, Wang, Z., Xie, R., & Liang, S. (2019). Bayesian optimized deep convolutional network for electrochemical drilling process. *Journal of Manufacturing and Materials Processing*, *3*(3), 57.
- Zhao, L., Chen, Y. W., Zhou, W., Shiu, R. K., Shen, S., **Lu, Y.**, ... & Chang, G. K. (2019). Polar coded OFDM signal transmission at the W-band in millimeter-wave system. *IEEE Photonics Journal*, *11*(6).
- **Lu, Y.**, Xie, R., & Liang, S. Y. (2020). CEEMD-assisted kernel support vector machines for bearing diagnosis. *The International Journal of Advanced Manufacturing Technology*, *106*(7), 3063-3070.
- **Lu, Y.**, Wang, Z., Xie, R., Zhang, J., Pan, Z., & Liang, S. Y. (2020). Bayesian optimized deep convolutional network for bearing diagnosis. *The International Journal of Advanced Manufacturing Technology*, *108*, 313-322.

Conference Papers:

- Felmont F Eaves, David O Kazmer, Gary Knight, Timothy Dietz, Don Griffin, **Yanfei Lu** (2018). BRIJJIT Force Modulating Tissue Bridges: Update and Strain Analyses. American Society for Aesthetic Plastic Surgery Annual Meeting 2018
- **Lu, Y.**, Li, Q., & Liang, S. Y. (2017, December). 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.

- Steven Liang, **Yanfei Lu**, Rui Xie (2019). Intelligent Diagnosis and Signal Processing of Vibration Signal from Rotating Machinery. ASPAI 2019 Conference

Reviewed Articles

- Multiscale biomechanics of the biphasic articular cartilage in the natural hip joint during routine activities. Computer Methods and Programs in Biomedicine. CMPB-D-21-00789
- Material Generation Algorithm: A Novel Metaheuristic Algorithm for Optimization of Engineering Problems. Processes (ISSN 2227-9717)
- On the Application of the Particle Swarm Optimization to the Inverse Determination of Material Model Parameters for Cutting Simulations.
  Modelling. **https://doi.org/10.3390/modelling2010007**
- Ultra-precision single point diamond turning process for sinusoidal and random wave pattern on a roller mold International Journal of Precision Engineering and Manufacturing. JPEM-D-20-00687
- A Hybrid Denoising Model Using Deep Learning and Sparse Representation with Application in Bearing Weak Fault Diagnosis.
  Mechanical Systems and Signal Processing. MSSP20-2567
- Recognition of Contamination Location on 11kV Polymer Insulators using Dual-Input Convolutional Neural Network Based on Feature Fusion and Bayesian Optimization Techniques
  Journal of Ambient Intelligence and Humanized Computing. AIHC-D-20-02621
- Bearing Fault Diagnosis Based on Iterative 1.5-dimensional Spectral Kurtosis.
  IEEE Access-2020-42970
- Biomechanical investigation of anterior cruciate ligament injury risk in pivoting leg during taekwondo kicks. International Journal of Precision Engineering and Manufacturing. JPEM-D-19-00603
- Determination of grinding chip thickness distribution based on material removal mode in grinding of Silicon Carbide Ceramics.
  International Journal of Precision Engineering and Manufacturing. JPEM-D-19-00181
- Iterative K-Singular Value Decomposition De-Noising Algorithm for Quantitative Fault Diagnosis of Bearings. IEEE Transactions on Instrumentation & Measurement. Paper #IM-18-18879.
- Feature Clustering Analysis Using Healthy Data towards Machine Performance Degradation Assessment. Part C: Journal of Mechanical Engineering Science. JMES-18-0813.
- The mechatronic device which provides comfort and safety for the elderly and disabled people. International Journal of Precision Engineering and Manufacturing. JPEM-D-18-00136.
- Study of Ultra-precision Machining Experiment of ECTS Combining X-Y Stage Responding to Yawing Motion Error with Z Stage Responding to Pitching Error.
  International Journal of Precision Engineering and Manufacturing. JPEM-D-17-00205

RESEARCH EXPERIENCE

MedShape Inc. Atlanta, GA 5/2016-11/2020

- Conducted image processing to measure bone resorption from x-ray
- Develop FE model for orthopedic implant and geometry optimization

Georgia Institute of Technology. Atlanta, GA
Graduate Research Assistant 5/2016-8/2019

- Conducted research on signal processing of machine vibration data
- Developed intelligent diagnostic algorithm to determine faults in machine components
- Implemented neural network for data classification and regression
- Measured strain using DIC and calculated J-integral in fracture mechanic
- Used DMA data to calibrate for hyperelastic and viscoelastic material models

TEACHING EXPERIENCE

Georgia Tech. Atlanta GA 5/2019-8/2019

Part Time Instructor for ME 3180 Machine Design

- Educated students on mechanical design disciplines
- Introduced students to various mechanical components and material properties

Georgia Tech. Atlanta GA 1/2019-5/2019

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

Full Time Instructor for ME 3210 Design and Manufacture

- Educated students on design and manufacturing processes
- Combined industrial experience to educate students on the most advanced processes and technologies
- Organized students' training on CNC machining process

Georgia Tech. Atlanta GA 1/2015-5/2015

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
- Prepared exam reviews for students

WORK EXPERIENCE

Forme Life San Francisco, CA 11/2020-Present

Senior Mechanical Engineer

- Finite element simulation for fitness equipment (abaqus, hyperwork, ansys)
- System reliability test support
- Support system owner and identify potential mechanical related issues within subsystems
- Work with suppliers in Taiwan to support DFM and material sourcing

MedShape Inc. Atlanta, GA

FE Simulation and Manufacturing Engineer 8/2012-11/2020

- Finite element simulation for orthopedic implants
- Design for manufacturing to reduce cost of products
- Continuous improvement on manufacturing process for implants
- Developed in-house CNC milling and turning processes for orthopedic implants
- Identified appropriate vendor with the suitable equipment for manufacturing
- Implemented fixture to improve positional accuracy and part rigidity
- Conducted tolerance studies within delivery system and proposed solution to reduce tolerance stackup
- Developed assembly processes and fixture to reduce assembly shift
- Calculated in-house CP/CPK to determine in-house capability
- Created CAD models and drawings for implant and assemblies
- Created DHF for implant. Involved in all phases of product launch
- Managed in-house production and distributed resource to meet project deadlines

Pressio Spine Inc. Atlanta, GA

Product Design Engineer 1/2019-Present

- Coordinated with vendors to develop fixture for grinding process
- Prototyped implant and instrument with 4-axis mill and 5-axis lathe
- Conducted detailed mechanical and mechanism design
- Supported implant inspection process
- Performed design for manufacturing for spinal fusion implant
- Optimized implant mechanical performance through ANSYS and Abaqus simulation
- Applied knowledge of solid mechanics into implant and instrumentation design

- Lead ACDF implant design activities
- Coordinated with vendors to develop and optimize implant manufacturing processes

SKILLS

Machining: Multi-axis CNC Machine Operation and Programming
Instrumentation: Instron and MTS, DMA Q800, Waterjet, Brown&Sharpe CMM, Oscilloscope, Function Generator, MyDAQ, Accelerometer
CAD/CAM/FEM: SolidWorks, ANSYS, Abaqus, MasterCAM, ProE, Gibbs CAM, Autodesk Fusion 360
Softwares: MATLAB, R, Labview, Python
Languages: English, Chinese
Certificates: Six Sigma Green Belt (IISE)

ACTIVITIES&HONORS

Editor of Materials (ISSN 1996-1944; CODEN: MATEG9)	2021
Reviewer of AIME, JPEM, MDPI, IEEE, MSSP, AIHC	2018-Present
Institute of Electrical and Electronics Engineer (IEEE)	2017-Present
Georgia Tech Highest Honor	5/2015
Georgia Tech ASME Member, Atlanta, GA	1/2014-5/2015
Georgia Tech Faculty Honors, Atlanta, GA	2012&2014&2015