

Hanglin Ye

Email: hanglinye@gmail.com

Education

Rensselaer Polytechnic Institute (RPI), U.S.A.

Mechanical Engineering

Ph.D. 2019

(Dissertation: Mechanical and Morphological Alternations in Skin Tissue due to Thermal Injury)

GPA:3.65

Wuhan University, China

Engineering Mechanics

B.E. 2008-2012

Research Interests

Scientific data analysis; Data Science; Machine learning; Data mining; Artificial intelligence; Statistical Analysis.

Technical Skills

Programming languages: SQL, Python, R, C++, C and FORTRAN

Machine learning and data mining tools: Matlab, SPSS, Minitab, TensorFlow, G*Power, Microsoft Excel

Business Intelligence (BI) tools: Tableau

Operation system: Linux (Ubuntu), Mac OS, Windows OS

Computer aided design/engineering: NX, Abaqus, COMSOL

Others: Microsoft Office Tools (PowerPoint, Word, Outlook), Latex

Certifications:

Databases and SQL for Data Science by IBM on Coursera. Certificate earned at Monday, September 30, 2019 10:38 PM GMT

Python for Data Science and AI by IBM on Coursera. Certificate earned at Thursday, October 10, 2019 10:54 PM GMT

Fundamentals of Visualization with Tableau by University of California, Davis on Coursera. Certificate earned at Tuesday, October 8, 2019 1:25 AM GMT

Data Analysis with Python by IBM on Coursera. Certificate earned at Wednesday, October 23, 2019 11:13 PM GMT

Language Skills

English, Chinese Mandarin and Cantonese

Research Experience

Graduate Research Assistant

CeMSIM, RPI (Advisor: Dr. Suvranu De)

2012-2019

Major duties: Performing research on data science; multi tasking on managing and supporting collaborations with cross-functional teams; generating reports needed for new processes, procedures; solving challenging research problems; delivering on project goals punctually; working closely with IT and management teams to resolve various data problems

- **Project 1: Ultrasound image data analysis and classification of burn severities with machine learning**

I achieved ~99% accuracy in classifying different burn severities for burnt skins, by processing and the analyzing the ultrasound image data with machine learning algorithms (SVM, PLS, *etc.*) and feature selection algorithms. Therefore, **I overcame the problem of ultrasound images not being able to differentiate between tissues with various levels of burns**. These results have contributed to our collaboration with researchers and surgeons from University at Buffalo and Erie County Medical Center for further validation of the methods and algorithms.

- **Project 2: Analysis of data from uniaxial tensile tests of different materials**

I demonstrated to our collaborators that there is a significant difference between the real skin tissues and the man-made skin substitutes, by performing statistical analysis (hypothesis testing such as t tests, multivariate tests, *etc.*) and classifications (SVM, PCA, *etc.*) on the Force-Displacement data obtained from uniaxial tensile tests on both real skin tissues and man-made skin substitutes. As a result, a collaborative project between our lab and the U.S. Army Natick Soldier Research, Development and Engineering Center (NSRDEC) is formed for the development of more realistic skin substitute materials.

- **Project 3: Analysis of Raman spectra data for burn classifications**

I achieved ~92% accuracy (compared with the 85% accuracy in literature) in predicting burn severities, by processing and analyzing the Raman spectra data obtained from skin tissues with machine learning algorithms (PCA, SVM and PLS), confirmed by statistical analysis. Hence, I developed a helpful technique for burn classification, which attracted high interest from our collaborators from medical centers.

Publication

Journal Articles

Ye, H., Rahul, Dargar, S., Kruger, U. and De, S., 2018. "Ultrasound elastography reliably identifies altered mechanical properties of burned soft tissues", *Burns*, 44(6). pp.1521-1530

Ye, H. and De, S., 2017. "Thermal injury of skin and subcutaneous tissues: A review of experimental approaches and numerical models", *Burns*, 43(5), pp.909-932.

Manuscripts Submitted

Ye, H., Rahul, Kruger, U., Wang, T., Shi, S. and De, S. "Burn-related Collagen Conformational Changes in *ex vivo* Porcine Skin using Raman Spectroscopy".

Ye, H., Rahul, Kruger, U., Wang, T., Shi, S. and De, S. "Classification of Burn Severities with Raman Spectroscopy on *ex vivo* Porcine Skin".

Lee, S., **Ye, H.**, Chittajallu, D., Kruger, U., Enquobahrie, A. and De, S. "Ultrasound imaging-based machine learning approach to identify altered characteristics of burned tissue in real time".

Conference Proceedings

Gallagher, S., **Ye, H.**, Makled, B., Parsey, C. Rahul, Norfleet, J., and De, S. "Evaluate the Fidelity of Synthetic Tissues Used in Escharotomy Simulators", Annual Conference and Exposition on Experimental and Applied Mechanics, 2019, Reno, Nevada, USA.

Ye, H., Rahul, Dargar, S., Kruger, U. and De, S. "Ultrasound imaging-based identification of thermal damage in burnt tissue", 14th US National Congress on Computational Mechanics (USNCCM14) 2017; Montreal, Canada.

Ye, H., Rahul, Dargar, S., Kruger, U. and De, S. "Ultrasound imaging-based identification of thermal damage in burnt tissue", Military Health System Research Symposium (MHSRS2017); Kissimmee, Florida, USA.

Awards and Recognitions

Third Rank of People's Scholarship of Wuhan University 2010

Merit Student of Wuhan University 2010

First Prize of the National Scholarship (for top ones of the class at Wuhan University) 2009

Teaching and Mentoring Experience

Graduate Teaching Assistant for Department of Mechanical, Aerospace, and Nuclear Engineering (MANE) at RPI

Spring 2018, Spring 2015, Fall 2012 – Spring 2013 *Engineering Graphics and CAD*

Fall 2014 *Engineering Dynamics*

Mentor undergraduate students for Undergraduate Research Program (URP) and master students on their thesis projects (2016, 2018-present)

Other activities

Internship at Three Gorges Dam hydroelectric system (2011)

Active member of Society of Women Engineers (SWE) and Chinese Students and Scholars Association (CSSA) in RPI