



Engineering & Scientific Consulting

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Professional Profile

Dr. Luo specializes in welding, manufacturing, the mechanics of materials, and finite element analysis (FEA). She has expertise in the assessment of weld quality, weld metallurgy and grain structure analysis, and solid-state welding process development and optimization. She is also knowledgeable in manufacturing processes and system design, statistical process control, and product design using design for six sigma approach.

Prior to joining Exponent, Dr. Luo was a graduate student research assistant in Assembly and Manufacturing System Laboratory at University of Michigan, where she investigated ultrasonic welding of multi-layered aluminum and copper sheets. Specifically, the bonding mechanisms between similar and dissimilar materials and joint propagation between interfaces. Through this work she demonstrated that interdiffusion and dynamic recrystallization are the key bonding mechanisms of joint formation in a uni-directional manner in the studied conditions. She also predicted bonding strength of the welds by mechanical tests, metallurgical examinations of the weld macrostructure and microstructure, and finite element modeling using Abaqus. In addition, Dr. Luo developed a localized preheating method to enhance the weldability of multi-layered copper sheets and analyzed the thermo-mechanical behavior using finite element modeling.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, University of Michigan, Ann Arbor, 2020

M.S., Mechanical Engineering, University of Michigan, Ann Arbor, 2012

B.S., Mechanical Engineering, University of Birmingham, UK, 2011

B.S., Mechanical Engineering, Huazhong University of Science and Technology, 2011

Prior Experience

Graduate Student Instructor, University of Michigan, 2013-2020

Languages

Mandarin

Publications

Luo, Y., Chung, H., Cai, W., Rinker, T., Jack Hu, S., Kannatey-Asibu, E. and Abell, J. Joint formation in multilayered ultrasonic welding of Ni-coated Cu and the effect of preheating. *Journal of Manufacturing Science and Engineering* 2018, 140(11).

Luo, Y., Wang, Y., Tai, B.L., Chen, R.K. and Shih, A.J. Bone geometry on the contact stress in the shoulder for evaluation of pressure ulcers: finite element modeling and experimental validation. *Medical Engineering & Physics* 2015, 37(2), pp.187-194.

Presentations

Luo, Y., Chung, H., Cai, W., Rinker, T., Jack Hu, S., Kannatey-Asibu, E. and Abell, J. Joint formation in multi-layered ultrasonic welding of ni-coated cu and process enhancement through preheating. MSEC2018, College Station, TX, USA, June 2018

Luo, Y., Chung, H., Cai, W., Rinker, T., Jack Hu, S., Kannatey-Asibu, E. and Abell, J. Bond formation and parameter effects in Al/Cu ultrasonic welding process. FabTech Expo, Las Vegas, NV, USA, November 2016