Exponent®
Engineering & Scientific Consulting

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Professional Profile

Dr. Kang's expertise in welding engineering with focuses on welding metallurgy and metal plasticity is used to conduct failure analysis investigations and quality evaluations of metallic systems. He has extensive experience in metallography and material characterization methods including scanning electron microscopy (SEM), electron back scattered diffraction (EBSD), and transmission electron microscopy (TEM). He is also skilled in full field displacement/strain analysis using digital image correlation (DIC). At Exponent, he focuses on the failure analysis of components in consumer electronics with an emphasis on the characterization and fracture analysis of metal and ceramics.

Prior to joining Exponent, Dr. Kang was a post-doctoral researcher at The Ohio State University, where he studied metal plasticity under the effect of ultrasonic vibration. Advanced characterization techniques such as high-speed imaging, high-resolution DIC, and EBSD were utilized to study the non-uniform deformation and the change in lattice misorientation. Dr. Kang also worked on a project that investigated the effect of Niobium in weld metal toughness of pipeline steel.

Academic Credentials & Professional Honors

Ph.D., Welding Engineering, Ohio State University, Columbus, 2022

M.S., Welding Engineering, Ohio State University, Columbus, 2020

M.Eng., Material Processing Engineering, Harbin Institute of Technology, 2018

B.Eng., Welding Engineering, Harbin Institute of Technology, 2016

Licenses and Certifications

American Welding Society Certified Welding Inspector (CWI)

Prior Experience

Post-doctoral researcher, The Ohio State University, August-December 2022

Languages

Mandarin Chinese

Publications

J. Kang, X. Liu, T. Wang, The effects of ultrasonic vibration on Portevin–Le Chatelier (PLC) effect and stress-strain behavior in aluminum alloy 2024, Scripta Materialia. 224 (2023) 115121.

J. Kang, X. Liu, S.R. Niezgoda, Crystal plasticity modeling of ultrasonic softening effect considering anisotropy in the softening of slip systems, International Journal of Plasticity. 156 (2022) 103343.

J. Kang, X. Liu, Ultrasonic Effect on the Deformation Behavior and Microstructure Evolution of a TRIP-Assisted Steel, Metallurgical and Materials Transactions A. 52 (2021) 4468–4478.

J. Kang, X. Liu, M. Xu, Plastic deformation of pure copper in ultrasonic assisted micro-tensile test, Materials Science and Engineering: A. 785 (2020)

J. R. Kang, X. G. Song, S. P. Hu, D. Liu, W. J. Guo, W. Fu, J. Cao, Wetting and brazing of alumina by Sn0.3Ag0.7Cu-Ti alloy, Metallurgical and Materials Transactions A. 48 (2017) 5870–5878.

J. R. Kang, X. G. Song, S. P. Hu, L. Ma, J. Cao, J.C. Feng, Interfacial microstructure, and properties of TC4/QCr0.8 joints brazed with AgCu filler, Transactions of China Welding Institute 39 (2018) 27–30.

R. Cheng, A. Bansal, J. Kang, X. Liu, A. Taub, Forming the Future, Springer International Publishing, Cham, 2021.

X. Liu, Q. Shi, M. Xu, J. Kang, S. Webb, Mechanisms of Ti and B on improving weld metal toughness of a Nb-alloyed steel, Materials Science and Engineering: A. 788 (2020) 139535.

Presentations

J. Kang, X. Liu, S.R. Niezgoda, Crystal plasticity modeling of ultrasonic softening effect considering anisotropy in the softening of slip systems, MS&T 2022, Pittsburgh, PA, October 9-12, 2022

J. Kang, R. Cheng, X. Liu, A. Taub, Ultrasonic effects on plastic deformation behavior of AA2024, MS&T 2021, Columbus, OH, October 17-20, 2021

J. Kang, X. Liu, Ultrasonically assisted tensile test of TRIP steel and delayed martensitic transformation, TMS 2021 Virtual, March 15-18, 2021

J. Kang, X. Liu, Analysis of Nb effects on weld metal properties, Manufacturing and Materials Joining Innovation Center (Ma2Jic), Lehigh University, Bethlehem, PA, June 26-27, 2019

Project Experience

Conducted failure analysis on metal and ceramic component and identified root cause of the fracture.

Peer Reviews

Metallurgical and Materials Transactions A