

Exponent®
Engineering & Scientific Consulting

Vir Nirankari, Ph.D., P.E.

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Professional Profile

Dr. Nirankari's areas of expertise include failure analysis, metallurgy, fracture, welding, finite element modeling and materials characterization. He has conducted research and failure analysis of metals and welds involving both experimental and computational approaches.

Dr. Nirankari has applied his expertise to a range of engineering fields, including automotive, aerospace, consumer electronics and utilities. He also has experience with mechanical testing techniques, fractography, metallurgical and microstructural analysis, non-destructive evaluation, microscopy and computational mechanics.

Dr. Nirankari has extensive experience performing mechanical testing as well as microstructural analysis via optical microscopy, scanning electron microscopy (SEM), electron backscattered diffraction (EBSD), transmission electron microscopy (TEM) and energy dispersive X-ray spectroscopy (EDS). He is also skilled in computed tomography (CT). His computational expertise lies in use of finite element modeling. He has extensive experience with commercial finite element software (Abaqus) and computer aided design software (SolidWorks).

During his graduate study at the University of Michigan, Dr. Nirankari's research included the use of mechanical testing to understand the crack initiation and small crack propagation behavior of aluminum spot welds and finite element modeling to predict the weld lifetime. As an undergraduate, Dr. Nirankari's research focused on improving the efficacy of plasma sprayed thermal barrier coatings for turbine blades.

Academic Credentials & Professional Honors

Ph.D., Materials Science and Engineering, University of Michigan, Ann Arbor, 2017

B.S., Mechanical Engineering, Boston University, 2010

Licenses and Certifications

Professional Engineer Metallurgical, California, #2039

SOLIDWORKS Certificate in Mechanical Design

Prior Experience

Graduate Student Research Assistance, University of Michigan, 2011-2017

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Professional Affiliations

American Welding Society (AWS) D10 Committee on Piping and Tubing:

AWS D10V Subcommittee on Tubular Steel Vehicle Structure

AWS D10 Committee on Piping and Tubing: AWS D10H Subcommittee on Aluminum Piping

AWS D8 Committee on Automotive Welding: AWS D8D Subcommittee on Automotive Resistance Spot Welding

International Organization for Standardization (ISO): ISO/TC 44/SC6, Resistance welding and allied mechanical joining

Publications

Nirankari V, McGann J, White K, Performance And Safety Implications Of Ultrasonic Spot Welding For Lithium-Ion Batteries: Best Practices And Case Study, International Materials Applications and Technology Conference, St Louis MO, September 14, 2021

Nirankari V, James B, Van Der Schjiff O, Grooving corrosion: differentiating weld defects from corrosion failure, Materials Science and Technology Conference, Columbus OH, October 17, 2018.

American Welding Society (AWS) Standard D10.10/D10.10M:2021 Recommended Practices for Local Heating of Welds in Piping and Tubing

Short Fatigue Crack Growth and Durability Modeling of Resistance Spot Welded 5754 and 6111, Nirankari V, PhD Thesis, University of Michigan, 2017.

Nirankari V, Li M, Allison J. Microstructural effects on small fatigue crack growth of resistance spot welded aluminum alloys 5754 and 6111. Oral presentation, The Minerals, Metals & Materials Society Annual Meeting, Nashville, TN, 2016.

Nirankari V, Li M, Allison J. Modeling small fatigue crack growth and applications to spot welded aluminum alloys 5754 and 6111. Poster presentation, The Minerals, Metals & Materials Society Annual Meeting, Nashville, TN, 2016.

Nirankari V, Li M, Allison J. Microstructural effects on small fatigue crack growth in resistance spot welded sheet 5754 and 6111 aluminum and durability modeling of eyebrow cracking in resistance spot welds. Oral presentation, Materials Science & Technology (MS&T), Columbus, OH, 2015.

Nirankari V, Li M, Allison J. Influence of microstructure on growth of small fatigue cracks in aluminum alloy 6111. Oral presentation, Materials Science & Technology (MS&T), Pittsburgh, PA, 2012.

Editorships & Editorial Review Boards

Journal of Failure Analysis and Prevention (Associate Editor)

Peer Reviews

International Journal of Fatigue

Journal of Failure Analysis and Prevention