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EDUCATION

- Ph.D.** **Materials Engineering**, 1991, University of Iowa, Iowa City, Iowa, U.S.A.
M.S. **Materials Science**, 1985, Rutgers University, New Brunswick, NJ, U.S.A.
M.Tech. **Metallurgical Engineering**, 1977, Indian Institute of Technology, Bombay, India
B.Tech. **Metallurgical Engineering**, 1975, Regional Engineering College Jawaharlal Nehru Technological University, Warangal, India.

SUMMARY OVERVIEW

- Over thirty five years of experience in materials engineering, nondestructive evaluation, and surface protective coatings.
- Demonstrated experience in composite materials, failure analysis, microstructural analysis, materials characterization, measurement of residual stresses in ferromagnetic materials, development of coatings and coating technologies for enhancing corrosion and oxidation resistance of materials, and development of life-prediction methodologies for thermal barrier coating systems.
- Development of coating processes to form nanostructured coatings by laser processing, magnetron sputtering process, and thermal spray technology.
- Developed and applied nondestructive evaluation procedures to detect creep damage in power plant structures, nuclear pressure vessels, and railroad bridges.
- Developing nanosensors for environmental monitoring.
- Developing water treatment technologies using nanocoated zeolites and other nanofiltration media.

PROFESSIONAL EXPERIENCE

September 2013-Current

- Senior Lecturer, Department of Mechanical Engineering, The University of Texas at San Antonio (UTSA), San Antonio.
 - Teaching Statics, Dynamics and Mechanics of Materials to undergraduate engineering students, Materials Engineering, Materials Engineering Laboratory, Composite Materials, Corrosion Engineering, Manufacturing Engineering, Engineering Practice and Graphics, Technical electives such as Intermediate Materials, Materials in Mechanical Design
- Consultant, BRL Consultants, San Antonio
 - Developing lesson plans and training materials related to Ultrasonic Phased Array Technology
 - Developing 3-day short courses on:
 - NDT of Materials, Components and Manufacturing Processes
 - Metallurgy for Non-Metallurgists

February 2009 – Current

Founder and COO, SAI Global Technologies, Inc.

- Dedicated to create, develop, and commercialize innovative products through applied research and development.
- Involved in developing shock dissipating materials using helically coiled carbon nanotubes (HCNTs).
- Involved in developing nanomaterials for supercapacitor applications.

May 1997 – January, 2009

Senior Research Engineer, Karta Technologies, Inc., San Antonio, Texas 78249

- Developed nondestructive evaluation (NDE) techniques of determining residual stresses in ferromagnetic materials.
- Evaluated corrosion-fatigue cracks in boiler tubes by guided ultrasonic waves.
- Developed a comprehensive approach for evaluating component reliability and remaining-life evaluation by innovative NDE techniques and data processing.
- Performed failure analysis of metallic and polymeric materials.
- Developed analytical and experimental methods to determine remaining durable life of turbine blades for aircraft engines.
- Developed and demonstrating the applicability of nanocoating technology for improving corrosion, oxidation, and wear resistance of materials.
- Investigated new laser and plasma processing techniques for enhancing oxidation resistance, thermal fatigue, wear and corrosion in metallic and nonmetallic materials.
- Developed innovative laser based manufacturing methods to enhance the performance of stainless steels, diecasting die steels, and carbon-carbon composites.

April 1992 – May 1997:

Research Metallurgist, Ames Laboratory and Center for NDE, Iowa State University, Ames, Iowa 50011

- Investigated new laser processing techniques to enhance energy efficiency in magnetic metallic glasses and silicon steels used in transformer cores
- Performed exploratory research to develop new amorphous magnetic fibers for sensor and energy efficient magnetic core applications
- Involved in the development of bonded magnets for automotive applications
- Investigated magnetic methods of nondestructive evaluation techniques to detect and evaluate material degradation due to fatigue, creep, neutron irradiation damage and other stress related effects in structural steels

July 1991 - April 1992:

Research Engineer, Laser Science Company, Ames, Iowa 50010

- Developed a new technique to produce amorphous coatings on metal-matrix composites (MMC) by laser chemical reduction of metallic salts to improve the corrosion and wear resistance.
- Involved in the development of laser chemical vapor deposition (LCVD) techniques to form cubic boron nitride (CBN) coatings on electronic materials.

January 1985 - May 1991:

Teaching Assistant, Department of Chemical and Biochemical Engineering
University of Iowa, Iowa City, Iowa 52242

- Assisted in teaching Materials Science, a core course with more than 60 students in each semester, set up examination papers, supervised laboratory experiments in mechanical testing and metallography of materials.
- Developed and set up new laboratory experiments in Materials Science.

March 1979 - August 1982

Metallurgical Engineer, Indian Space Research Organization, Trivandrum, India

- Developed material and heat treatment process specifications for rocket engine components
- Developed and implemented a quality control process for heat treatment of engine components
- Designed and developed nondestructive evaluation procedures for evaluating corrosion and fatigue in rocket engine components

SMALL BUSINESS INNOVATIVE RESEARCH (SBIR) GRANTS/AWARDS

- Thermal barrier coating life determination, Phase I and Phase II, Air Force Research Laboratories (AFRL), 2005-2008, Phase I - \$100,000, Phase II - \$700,000
- Nanostructured coatings by pulsed plasma processing for alloys used in coal-fired environments, Small Business Technology Transfer (STTR) Phase I and Phase II Grants, Department of Energy (DOE), 2005-2008, Phase I - \$100,000, Phase II - \$750,000
- Advanced blade damping coatings, Phase I, SBIR Grant, Department of Navy, November 2007-May 2007, \$70,000
- Development of laser fusion coatings for improving oxidation resistance of carbon-carbon composites”, Phase I and Phase II, Ballistic Missile Defense Organization (BMDO), 1998, 2001-2003, \$700,000
- Development of an innovative laser assisted coating process for extending lifetime of metal casting dies”, Phase I Research Grant, Department of Energy (DOE), 1998-99, \$70,000
- Laser surface modification for improving corrosion resistance of steels used in coal-fired power systems, Phase I Research Grant, Department of Energy (DOE), 2001-2002, \$100,000.

SPECIALIZED SKILLS

- Experience and familiarity with various material processing tools such as CO₂ lasers, excimer lasers, thermal spray, and magnetron sputtering.
- Experience in mechanical testing techniques and material analysis using instrumental techniques such as: Scanning electron microscopy (SEM), optical microscopy, and Energy dispersive X-ray microanalysis (EDAX)
- Experience with ultrasonic, eddy current, and magnetic methods of nondestructive testing.

PROFESSIONAL ACTIVITIES

- Member, South Texas Section of the American Society for Nondestructive Testing (ASNT) during 2002-2003, 2008-2009.
- Member, Northwest Vista Nanotechnology Advisory Board, San Antonio, Texas
- Founder and Chief Executive Officer of a high-tech start-up “SAI Global Technologies, Inc.”
- Organizing Committee Member of the San Antonio Nanotechnology Forum (SANTF)

SCIENTIFIC AND TECHNICAL SOCIETY MEMBERSHIPS

Member of ASM International (ASM), The Metallurgical Society (TMS), and American Society for Nondestructive Testing (ASNT), and American Society of Mechanical Engineers (ASME), and NACE International.

ADDITIONAL INFORMATION

U.S. Citizen.