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Nikhil D. Sharma

OBJECTIVE:

To seek a research and technology development position that challenges my engineering and practical skills.

EDUCATION:

Doctor of Philosophy (Ph.D.) in Mechanical Engineering University of Houston, Houston, TX
GPA: 3.614 August 2006 - December 2008 (Expected)
Dissertation: Creating piezoelectric nano-composites without using piezoelectric constituents.
Courses: Continuum mechanics, Micromechanics, Nanomechanics, Partial differential equations, Theoretical and computational materials science, Solid state physics.

Master of Science (M.S.) in Mechanical Engineering University of Houston, Houston, TX
GPA: 3.57 August 2003 - May 2006
Courses: Convex Optimization, Theory of elasticity, Fracture mechanics, Computer methods for machine design.

Bachelor of Engineering (B.E.) in Mechanical Engineering University of Pune, India
GPA: 3.70 (First Class with Distinction - 66%) August 1996 - August 2000
Courses: Machine tool design, Operations research, Machine Design, Theory of machines.

EXPERIENCE:

Research Assistant **Mechanical Engineering, Univ. of Houston, TX** June 2005 – Present
Expertise: COMSOL, ABAQUS, Nanomechanics, Mathematical modeling, Finite element modeling, Homogenization, Composite structures.

- Optimization and improved predictability of S-Seal performance in closed glands for High Pressure High Temperature applications. Failure prediction at HPHT conditions without physical tests through use of improved material models for finite element modeling, analysis and damage model.
- Piezoelectric composite without using piezoelectric materials. Using non-piezoelectric materials, modeled a nano-composite material which has apparent piezoelectric behavior close to 10 % of Quartz.
- Homogenization of the effective piezoelectric properties for a non-piezoelectric $BaTiO_3$ film. BaTiO3 film with non-centrosymmetric holes can exhibit close to 120 % of Quartz.
- Electromechanical coupling in non-piezoelectric materials at nanoscale. The coupling between strain gradients and polarization and conversely strain and polarization gradients, investigated. Analytical solutions developed for embedded mismatched inclusion problem.

Automation Specialist **Quest Automation, Alvin, TX** July 2004 - August 2004
Expertise: PLC Programming, Automation, Machine vision.

- Integrated 'Machine Vision' with Pneumatic and Electrical Automation Components using PLC Programming, DVT Camera Programming Script and created Human Machine Interface (HMI) using VB6.0.
- Designed and manufactured Automation Mechanisms and Electrical Circuits.

Senior Engineer **TATA Motors, Pune, India** July 2000 - July 2003
Expertise: Vendor Quality Assurance, Quality systems, Tools validation and process design, SAP (QA, SD).

- Quality and Process Management Department
  - Led team of 7 engineers for Verification and Audit of purchased sheet Metal components from 19 suppliers for Passenger Car Body (BIW). *Component Rejections were brought down by 58%.*
  - Implemented *Quality systems (ISO 9000, QS 9000, 5S, Kaizen, Poka Yoke)* at suppliers' end.
- Technical Services Department
  - Reduced excessive rework due to incorrect Rear Wheel Camber Angle Setting through Design and process improvements. *Savings of 30% per day of tact time for car.*
  - Established *Gun Drills* instead of *Solid Carbide through Coolant Drills* for Oil Gallery Drilling.
  - Established frequency and procedure for periodic servicing of *TAPMATIC assemblies* used for tapping on *High Velocity Ingersoll Machines.*

SOFTWARE:

- **CAD, FEA and other Software:** COMSOL, ABAQUS, ANSYS, IdeaS, Working Model, AutoCAD 2004, Solid Works.
- **Mathematical modeling and Programming:** MATLAB, Mathematica, FORTRAN, PLC Programming, DVT Programming Script, CNC programming, AutoLisp, C, Visual Basics.
- **Database/Analysis:** SAP (QA and SD modules), MS Access.

PUBLICATIONS:

- **ND Sharma**, P Sharma, "*Effective piezoelectric properties for a non-piezoelectric film with triangular hole.*" – (In Progress), 2008.
- **ND Sharma**, R Sharma, P Sharma, "*Asymptotic homogenization and scale effects.*" – (In Progress), Review paper, 2008.
- **ND Sharma**, R Maranganti, P Sharma, *"On the possibility of piezoelectric nanocomposites without using piezoelectric materials.*" - Journal of the Mechanics and Physics of Solids, **55**, 2328–2350, 2007.
- R Maranganti, **ND Sharma**, P Sharma, "*Electromechanical coupling in nonpiezoelectric materials due to nanoscale nonlocal size effects: Green's function solutions and embedded inclusions*", - Physical Review B, **74**,014110, 2006.

PRESENTATIONS AND POSTERS:

- **ND Sharma**, *"A new paradigm in designing piezoelectric sensors and materials using nanoscale effects.*" TiiMS-URETI, Texas A&M University, 2007.
- **ND Sharma,** R Maranganti, M Sabri, "*Nanoscale Piezoelectricity and the Possibility of Apparently Piezoelectric Composites without Piezoelectric Constituents.*" TiiMS-URETI, Texas A&M University, 2007.
- **ND Sharma**, X Zhang, R Maranganti, "*Size dependent mechanics.*" TiiMS-URETI, Texas A&M University, 2005.

CONFERENCES:

- Mechanics and Materials (MCMAT) Conference, Austin, TX, 2007.
- The 5th Annual Review Meeting of Texas Institute for Intelligent Bio-nano Materials and Structures for Aerospace Vehicles (TiiMS-URETI), College Station, TX, 2007.
- The 3rd Annual Review Meeting of Texas Institute for Intelligent Bio-nano Materials and Structures for Aerospace Vehicles (TiiMS-URETI), College Station, TX, 2005.

MAJOR ACADEMIC PROJECTS:

- Optimal Topology for 7x7 mesh ground structure.
- Optimal Control of Robotic Motion Sequence by Dynamic Programming.
- Design and Manufacturing of 'Bearing Cap Nicking Machine' for Cummins Diesel Engines.

ACTIVITIES AND HONORS:

- Graduate Research Fellowship at University of Houston (2004-Present).
- The Texas Public Education Grant (TPEG) (2004-Present).
- Teaching Assistant: AutoCAD and Fluid Mechanics (2004-2005); Theory of Machines (2001-2003).
- Member of iMechanica.org, American Society of Mechanical Engineers (ASME), Society of Automotive Engineers (SAE).
- Organizer - FERVOR (Technical Paper Presentation Contest at University of Pune, India) (2000).

References available on request. ***Willing to relocate.***