Devendra Verma, Ph.D.

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Personal
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SUMMARY

Accomplished Materials and Mechanical Engineer with over 13 years of experience in semiconductor technology, supplier management, and advanced materials development.
Expertise in driving business impact through data-driven problem-solving, project management, and innovation in semiconductor processes.
Adept at leading global supplier relationships, optimizing supply chains, and developing new technologies in high-demand industries.

- 2 Patents and 27 publications in advanced materials and semiconductor processes.
- 8+ years of supplier/customer management and project planning experience.
- 13 years of microscopy and material characterization experience.

PATENTS & PUBLICATIONS

Patents 2 Patents in advanced materials and manufacturing in semiconductor manufacturing.

Publications 27 publications in materials and structural reliability, and failure analysis.

EDUCATION

2016 **Ph.D.** in Aeronautics and Astronautics Engineering
Purdue University, West Lafayette, IN
Advisor: Prof. Vikas Tomar
Thesis: Interfacial Mechanical Strength Characterization in Multilayered Materials via Nanoscale Impact and Nano Mechanical Raman Spectroscopy Experiments

2012 **Master of Science** in Aeronautics and Astronautics Engineering
Purdue University, West Lafayette, IN
Structures and Materials

2011 **Bachelor of Technology** in Aerospace Engineering
Indian Institute of Technology, Kanpur, India

RESEARCH EXPERIENCE

2022-present **Supply Chain Specialist**
Intel Corporation, Phoenix, AZ

Advanced Packaging (Wafer Level Assembly)
My work is focused on developing industry leading solutions for wafer level advanced packaging for the semiconductor industry such as CoWoS, Foveros, Memory Stacking etc. My expertise is in Thermal Processes, Die Bonding/Attach Processes and CMP.

Strategic Supplier Management: Led the management of five global semiconductor suppliers for next-gen packaging on glass substrates, ensuring alignment with market trends.
Capital Expenditure Leadership: Delivered and supported $100M in CapEx for die attach and thermal process tools, with a roadmap targeting $1.2B in long-term investments.
New Product Introduction (NPI): Facilitated NPI through strategic in-house installations and hybrid/virtual supplier lines.
Contract Negotiation Expertise: Led contract negotiations for P-spec tools, optimizing selection processes and achieving top performer status.

Substrates Manufacturing
I led the supplier ecosystem development for glass substrates for the next generation substrate solutions. My work is focused on Substrate packaging solutions including Silicon bridges in Substrate such as EMIB or in Mold such as InFo, CoWoS-R

Managed 5 global semiconductor suppliers, with a focus on thermal process tools and materials.
Led the development of next-generation packaging on glass substrates, involving thermal and mechanical analysis.
Delivered $100 million CapEx across thermal process tools, ensuring adherence to thermal-mechanical requirements.

2020-2022 **Senior Process Development Engineer**
Heraeus, Phoenix, AZ

Advanced Ceramic Manufacturing (2 Patents)
I managed the production line for high end ceramic manufacturing utilized in semiconductor equipment. I navigated the material/powder sourcing, milling/chemistry, sintering process and machining to match the customer needs. I applied thermodynamic and heat transfer principles in the development of new materials for semiconductor process tooling. I conducted risk assessments and

optimized production cells, enhancing thermal-mechanical stability in manufacturing. I am a trained **SHAININ RED X** Problem-solving expert for Thermal-Mechanical-Fracture scenarios.

Advanced Problem-Solving: Specialized in SHAININ RED X for resolving complex Thermal-Mechanical-Fracture issues.
Innovative R&D Leadership: Led the development of new materials, optimizing production processes, and securing two patents in ceramic materials.
Strategic Supplier Management: Implemented change management strategies and conducted quality audits to ensure supplier compliance and enhance performance.

2019-2020 **Product Manager,**
KLA, Thermo Fisher (Nanoscience Instruments), Phoenix, AZ

M**anufacturing (4 Refereed Journal Papers)**

I served as a technical expert and customer-facing scientist, delivering presentations, training, and support for SEM, ion milling, and nanoindentation tools. I managed key relationships with four global instrument suppliers and over 100 customers across the United States, providing tailored metrology solutions. I trained engineers on the Design of Experiments and reporting standards in ISO 9001 and GMP environments.

Value Proposition: Establishing product value by defining standards for experimentation and data verification.
Cross-Functional Leadership: Leading sales and marketing teams to align product strategies with business goals.
Market Strategy: Identifying key market verticals and developing targeted growth strategies to maximize market penetration.

Led the design and execution of experimental programs in SEM, Ion Milling, and Nanoindentation, focusing on failure analysis.
Developed solutions for thermal and mechanical challenges in semiconductor, automotive, and aerospace systems.
Managed technical communications and reporting for clients, ensuring clear conveyance of complex thermal analysis results.
Guiding Clients: Advising on product qualification processes to ensure compliance and efficiency.
Strategic Development: Defining DOE benchmarks to optimize product development and enhance performance.
Risk Management: Developing and implementing FMEA to identify and mitigate potential product issues.

2017-2020 **Applications Scientist**
Nanoscience Instruments, Phoenix, AZ
Subject Matter Expert: Nanoindentation, Scanning Electron Microscopy, Ion Milling, in-situ Nanomechanical Testing

I developed solutions for emerging materials problems in the automotive, aerospace, pharmaceutical, biomaterials industries for the next 5-10 years based on current growth trends. I actively collaborate with universities to develop new measurement techniques and applications in advanced materials systems to uncover principles of strengthening and failure mechanisms.

Thermal Sciences: Conducted failure analysis and thermal risk mitigation in semiconductor devices.
Mechanical Analysis: Performed high-temperature nanoindentation experiments to study material behavior under thermal stress.

Additive Manufacturing (5 Refereed Journal Papers)
My work also focused on analyzing different additive manufacturing techniques such as laser sintering, wire arc method, and fold forging and its effect on the material properties. The high temperature creep and strengthening mechanisms are analyzed by performing high temperature nanoindentation experiments. The microstructural contributions are investigated with TEM, EBSD and SEM.

Summary of Recent Projects

- Sub 1000 nm nanomechanical characterization for material (additive materials, metals, ceramics, polymers) property, microstructural evolution, and failure analysis using nanoindentation, tensile test, SEM, EDS, and TEM
- Sub 100 nm nanofiber production for filters/masks, core-shell fibers, and pharma API delivery using electrospinning
- Sub 10 nm nanoparticles for catalysis, sensors, batteries, additive manufacturing, and healthcare using spark ablation, Raman spectroscopy and TEM

2011-2016 **Research Scientist**
Purdue University, West Lafayette, IN

Interface Mechanics (4 Refereed Journal Papers)
My dissertation work examined the role of interfaces in multilayered materials deformation and fracture mechanisms under static and

dynamic loading. I developed visco-plastic models for interfaces with account of interface energy. I also analyzed the failure modes and correlated them to the microstructure characteristics.

Biomaterials (6 Refereed Journal Papers)
I investigated the microstructural characteristics responsible for exceptional strength and toughness in biomaterials. I characterized the effect of temperature-stress-strain by nanoindentation on shrimp shells. A visco-elastic model was developed for biomimetic materials based on the creep characteristics. The interfacial mechanics of bio/biomimetic materials was experimented quantified and modeled for FEM analysis.

High Temperature Super Alloys (3 Refereed Journal Papers)
I analyzed microstructure/irradiation dependence on high temperature deformation of super alloys. The investigations resulted in the development of relations to predict yield strength as a function of temperature/irradiation. The effect of fabrication methods on the microstructure with non-destructive testing was also evaluated.

2010 **Research Fellowship**
Texas A&M University, College Station, TX

Shape Memory Alloys
I studied the damping characteristics of shape memory alloys and their applications in damping reduction. The example application for oil wells fire safety was analyzed.

Material Analysis: Investigated the damping characteristics of Shape Memory Alloys (SMA) at high frequencies, focusing on crystallographic changes.
Application Research: Explored potential applications of SMA for vibration isolation, contributing to advancements in material science and engineering.

2007-2011 **Research Scientist**
Indian Institute of Technology (IITK), Kanpur, India

Composite Materials
I developed experimental protocols for the fabrication of composite laminates and calculating their stiffening properties. I performed failure analysis by analytical methods and verified it with tensile and fracture tests.

TEACHING EXPERIENCE

2017-2020 **Applications Engineer/Product Manager**
Nanoscience Instruments, Phoenix, AZ

I deliver product application knowledge to customers via webinars, conference talks, industry seminars and technical articles. In this role, I have traveled to 40 states in the USA visiting 100+ lab groups in universities and industries (aerospace, automotive, pharmaceutical, and biomaterials) to teach and train students/engineers at various levels in different aspects of instruments and their working principles.

I apply my training from **Dr. Brent and Dr. Felder's** workshops to effectively deliver lectures and actively engage students.

2020 Instructor, PITTCON Conference & Expo, Chicago, IL
An Introduction to Scanning Electron Microscopy (SEM) and Associated Energy Dispersive X-ray Spectroscopy (EDS)

2019-present **Certified Yoga Teacher**
(Sampoorna Yoga)

2016 Teaching Assistant in Aeronautics and Astronautics Engineering
Purdue University, West Lafayette, IN
AAE204, Aeromechanics II

2013 **Lecturer**, Wabash Area Lifetime Learning Association
City of West Lafayette, IN

2012 Teaching Assistant in Aeronautics and Astronautics Engineering
Purdue University, West Lafayette, IN
AAE555, Finite Element Methods

HONORS AND AWARDS

2025 Intel EPIC Supplier Award
2024 QPB+, Top Intel Group Performance
2024 GSEM Excellence Award Winner
2022 QPB+, Top Intel Group Performance
2022 Patents filing for Ceramic engineering
2015 Haythornthwaite Foundation Student Travel Award
2015 Society of Engineering Science Travel Award
2015 Outstanding Service Scholarship

2014	United States Association for Computational Mechanics
2014	2nd prize, Academic Engagement Poster
2014	Graduate Student Excellence Award
2013	Office of Engagement Grant
2013	NSF Fellowship
2011	Erasmus Mundus (Europe) Exchange Program Scholarship

AREAS of EXPERTISE

Thermal Sciences: Thermodynamics, Heat Transfer, Fluid Mechanics, Combustion
Data Analysis: Analyzing complex data, computational modeling, statistical analysis
Experimental Programs: Designing and executing experiments, lab management, technical documentation
Technical Communication: Report writing, presentations, client communication
Project Management: Risk assessment, project planning, interdisciplinary collaboration

RESEARCH EXPERTISE

Research Assistant, Purdue University, West Lafayette, IN 2011-2016

- **Thermal-Mechanical Analysis:** Characterized thermal stress-strain effects in biomaterials.
- **High-Temperature Alloys:** Analyzed microstructure and deformation under high-temperature conditions.

Independent Collaborations 2017-present

- **Additive Manufacturing**: Explored temperature effects on nanoindentation and failure zones in advanced materials.

TECHNICAL SKILLS

Research Assistant, Purdue University, West Lafayette, IN 2011-2016

- **Modeling & Simulation**: MATLAB, Python, ABAQUS
- **Experimental Tools**: SEM, Nanoindentation, Ion Milling, Raman Spectroscopy
- **Technical Documentation**: Report Writing, Technical Presentations

PATENTS

1. **Sintering device with temperature gradient control.**

   US2023/027804 · Issued Feb 15, 2024

2. **Process for sintering large diameter yag layers substantially free of unreacted yttrium oxide and yttrium rich phases.**

   US2023/027804 · Issued Jan 25, 2024

PUBLICATIONS

Google Scholar Profile

Book

1. V. Tomar, T. Qu, D. K. Dubey, D. Verma, Y. Zhang, "Multiscale Characterization of Biological Systems: Spectroscopy and Modeling", Springer-Verlag New York, 2015, ISBN 978-1-4939-3451-5

Refereed Journal Publications

1. F. Khodabakhshi, A.P. Gerlich, D. Verma, M. Nosko, M. Haghshenas, "Small-scale plasticity of ultra-fine grained alloy and nanostructured nanocomposite: Ambient and elevated-temperature nanoindentation", Materials Science and Engineering: A 807, 140873 (2021)
2. F. Khodabakhshi, A.P. Gerlich, D. Verma, M. Nosko, M. Haghshenas, "Depth-sensing thermal stability of accumulative fold-forged nanostructured materials", Materials & Design, 109554 (2021)
3. S.I. Shakil, C. Dharmendra, B.S. Amirkhiz, D. Verma, M. Mohammadi, M. Haghshenas, "Micromechanical characterization of wire-arc additive manufactured and cast nickel aluminum bronze: Ambient and intermediate temperatures", Materials Science and Engineering: A 792, 139773 (2020)
4. F. Khodabakhshi, A.P. Gerlich, D. Verma, and M. Haghshenas, "Nano-indentation behavior of layered ultra-fine grained AA8006 aluminum alloy and AA8006-B4C nanostructured nanocomposite produced by accumulative fold forging process", Materials Science and Engineering: A 744, 120-136 (2019)
5. J. Thornby, D. Verma, R. Cochrane, A. Westwood, V. B. Manakari, M. Gupta, M. Haghshenas, "Indentation based characterization of creep and hardness behavior of magnesium carbon nanotube nanocomposites at room temperature" SN Applied Sciences 1:695 (2019)
6. A. Datye, S. Kube, D. Verma, J. Schroers, and U. D. Schwarz, "Accelerated discovery and mechanical property characterization of bioresorbable amorphous alloys in the Mg–Zn–Ca and the Fe–Mg–Zn systems using high-throughput methods", Journal of Material Chemistry B,7, 5392-5400 (2019)
7. J. J. Pavón, J. P. Allain, D. Verma; M. Echeverry-Rendón, C. L. Cooper, L. M. Reece, A. R. Shetty, V. Tomar: "In situ Study Unravels Bio-Nanomechanical Behavior in a Magnetic Bacterial Nano-cellulose (MBNC) Hydrogel for Neuro-Endovascular Reconstruction" Macromolecular bioscience, 1800225, (2018)
8. D. Verma, S. Biswas, C. Prakash and V. Tomar: "Relating Interface Evolution To Interface Mechanics Based On Interface Properties", *JOMJ-D*, (2016).
9. D. Verma, M. Exner and V. Tomar: "An Investigation into Strain Rate Dependent Constitutive Properties of a Sandwiched Epoxy Interface", *JMAD*, (2016).

10. J. Marsh, Y. Zhang, D. Verma, and V. Tomar: "Nanomechanical Characterization of Temperature Dependent Mechanical Properties of Ion Irradiated Zirconium with Consideration of Microstructure and Surface Damage" *JOM, 67(12), 2945* (2015).
11. J. Marsh, Y.s. Han, D. Verma and V. Tomar: "An Investigation into Plastic Deformation of Irradiated Tungsten Microstructure at Elevated Temperatures using the Anand's Viscoplastic Model" *International Journal of Plasticity, 74, 127* (2015).
12. T. Qu, D. Verma, M. Alucozai and V. Tomar: "Influence of Interfacial Interactions on Deformation Mechanism and Interface Viscosity in α-Chitin–Calcite Interfaces" *Acta Biomaterialia, 25, 325* (2015).
13. D. Verma, J. Singh, A.H. Varma and V. Tomar: "Evaluation of Incoherent Interface Strength of Solid-State-Bonded Ti64/Stainless Steel Under Dynamic Impact Loading" *JOM,* 67(8), 1694 (2015).
14. D. Verma and V. Tomar: "A Comparison of Nanoindentation Creep Deformation Characteristics of Hydrothermal Vent Shrimp (*Rimicaris exoculata*) and Shallow Water Shrimp (*Pandalus platyceros*) Exoskeletons" *Journal of Materials Research,* 30(8), 1110 (2015).
15. D. Verma and V. Tomar: "An Investigation into Mechanical Strength of Exoskeleton of Hydrothermal Vent Shrimp (*Rimicaris exoculata*) and Shallow Water Shrimp (*Pandalus platyceros*) at Elevated Temperatures" *Materials Science and Engineering: C,* 49, 243 (2015).
16. [Featured on Cover Page] D. Verma, T. Qu and V. Tomar: "Scale Dependence of the Mechanical Properties and Microstructure of Crustaceans Thin Films as Biomimetic Materials" *JOM,* 67(4), 858 (2015).
17. T. Qu, D. Verma, M. Shahidi, B. Pichler, C. Hellmich and V. Tomar: "Mechanics of Organic-Inorganic Biointerfaces—Implications for Strength and Creep Properties" *MRS Bulletin,* 40(4), 349 (2015).
18. D. Verma and V. Tomar: "An Investigation into Environment Dependent Nanomechanical Properties of Shallow Water Shrimp (*Pandalus platyceros*) Exoskeleton" *Materials Science and Engineering: C,* 44, 371 (2014).
19. D. Verma and V. Tomar: "Structural-Nanomechanical Property Correlation of Shallow Water Shrimp (*Pandalus platyceros*) Exoskeleton at Elevated Temperature" *Journal of Bionic Engineering,* 11(3), 360 (2014).

Peer Reviewed Publications in Conference Proceedings

1. F. Alghamdi, D. Verma, and M. Haghshenas, "Small-scale Characterization of Additively Manufactured Aluminum Alloys through Depth-sensing Indentation", in Solid Freeform Fabrication Symposium Proceedings (SFF Symp 2018)
2. D. Verma and V. Tomar, "Interface Mechanical Strength and Elastic Constants Calculations via Nano-impact and Nanomechanical Raman Spectroscopy" in Fracture, Fatigue, Failure and Damage Evolution, Volume 7: Proceedings of

the 2017 Annual Conference on Experimental and Applied Mechanics (Springer International Publishing, City, 2017).

3. D. Verma, C Prakash and V. Tomar, "Properties of Material Interfaces: Dynamic Local Versus Nonlocal" in Handbook of Nonlocal Continuum Mechanics for Materials and Structures, 2017
4. D. Verma, C. Prakash, and V. Tomar, "Interface Mechanics and its Correlation with Plasticity in Polycrystalline Metals, Polymer Composites, and Natural Materials" in 11th International Symposium on Plasticity and Impact Mechanics, Implast 2016, New Delhi, India, Dec 11-14, 2016
5. D. Verma, T. Qu and V. Tomar: Scale Dependence of the Mechanical Properties of Interfaces in Crustaceans Thin Films, in Mechanics of Biological Systems and Materials, Volume 6: Proceedings of the 2016 Annual Conference on Experimental and Applied Mechanics, (Springer International Publishing, City, 2017), pp. 17.
6. C. Prakash, D. Verma, M. Exner, E. Gunduz and V. Tomar: Strain Rate Dependent Failure of Interfaces Examined via Nanoimpact Experiments, in Challenges in Mechanics of Time Dependent Materials, Volume 2: Proceedings of the 2016 Annual Conference on Experimental and Applied Mechanics (Springer International Publishing, City, 2017), pp. 93.
7. T. Qu, D. Verma and V. Tomar: A Nanomechanics Based Investigation into Interface Thermomechanics of Collagen and Chitin Based Biomaterials, in Mechanics of Biological Systems and Materials, Volume 6: Proceedings of the 2015 Annual Conference on Experimental and Applied Mechanics, (Springer International Publishing, City, 2016), pp. 119.
8. D. Verma, C. Prakash, and V. Tomar., 2015, "Strain Rate Dependent Failure of Metallic Interfaces at Nano-Microscale Via Nanoimpact Experiments" in Proceedings of ICCM20, July 19-24, Copenhagen, Denmark, Paper No. 150701-2814.

Conference Presentations (no proceeding paper)

1. M. Haghshenas, D. Verma, C. Dharmendra, and M Mohammadi, "Small-scale Characterization of Wire-Arc Additive Manufactured Nickel Aluminum Bronze Alloy" TMS2020, San Diego, CA, USA Feb 23 - 27, 2020
2. M. Haghshenas, D. Verma, and M. Gupta, "Elevated temperature nanomechanical characterization of Mg-nanocomposites" TMS2019, San Antonio, TX, USA Mar 10 - 14, 2019
3. F. Alghamdi, D. Verma, and M. Haghshenas, "Small-scale Characterization of Additively Manufactured Aluminum Alloys through Depth-sensing Indentation" in SFF Symposium 2018 Austin, TX, USA Aug 13 - 15, 2018
4. T. N. Nguyen, J. Pribe, T. Siegmund, D. Verma, V. Tomar, and J. Kruzic, "Rate- and Size-Dependent Plasticity of a Nickel-base Superalloy in Instrumented Nanoindentation Processes" SEM 2017, Indianapolis, IN, USA Jun 12 - 15, 2017

5. D. Verma and V. Tomar, "Interface Mechanical Strength and Elastic Constants Calculations via Nano-impact and Nanomechanical Raman Spectroscopy" SEM 2017, Indianapolis, IN, USA Jun 12 - 15, 2017
6. D. Verma and V. Tomar, "Interface Mechanical Strength and Interface Elastic Constants Calculations in Thin Films of Polymer Composites, and Natural Materials" TMS 2017, San Diego, CA, USA Feb. 26 - Mar 2, 2017
7. D. Verma and V. Tomar, "Strain Rate Dependent Failure of Interfaces in Glass/Epoxy and Energetic Materials at Nano-microscale" ASME IMECE 2016, Phoenix, AZ, USA Nov. 11-17, 2016
8. D. Verma and V. Tomar, "Interface Mechanical Strength and Interface Elastic Constants Calculations in Polymer Composites, and Natural Materials" SES 2016, College Park, MD, USA Oct. 2-5, 2016
9. D. Verma, C. Prakash, and V. Tomar, "Strain Rate Dependent Failure of Ammonium Perchlorate-HTPB Interfaces at Nano to Microscale Examined via Nanoimpact Experiments" in Proceedings of SEM 2016, Orlando, FL, June 6-9, 2016
10. D. Verma, and V. Tomar, "Strain Rate Dependent Failure of Epoxy Interfaces between Glass Plates" THERMEC 2016, Graz, Austria, May 29 - June 3, 2016
11. D. Verma and V. Tomar, "Strain-rate Dependent Deformation Characteristic Mechanisms of Confined Epoxy Interfaces" EMIPMC2016, Nashville, TN, May 22-25, 2015
12. D. Verma and V. Tomar, "Strain-rate Dependent Failure of Glass/Epoxy Interfaces" TMS 2016, Nashville, TN, USA Feb. 14-18, 2016
13. D. Verma and V. Tomar, "Strass-strain Analysis of Glass/Epoxy Interfaces via Quasistatic and Dynamic Indentation" IMECE2015, Houston, TX, Nov. 13-19, 2015
14. D. Verma and V. Tomar, "An Analysis and Characterization of Interface Thickness Dependent Deformation Mechanisms via Dynamic Indentation" SES 2015, College Station, TX, USA Oct. 26-28, 2015
15. D. Verma and V. Tomar, "Strain Rate Dependent Failure of Metallic Interfa ces at Nano-micro Scale via Nano-Impact Experiments" ICCM20, Copenhagen, Denmark July 19-24, 2015
16. [Keynote] D. Verma and V. Tomar, "An Investigation into Strain-rate Dependent Failure of Metallic Material Interfaces" McMat2015, Seattle, WA, USA June 29-July 1, 2015
17. D. Verma and V. Tomar, "A Nanomechanics Based Investigation into Interface Thermomechanics of Collagen and Chitin Based Biomaterials" SEM2015, Costa Mesa, CA, Jun 8-11, 2015
18. D. Verma and V. Tomar, "An Investigation into Strain-rate Dependent Failure of Material Interfaces" MACH Conference, Annapolis, MD, USA April 8-10, 2015
19. [Invited] D. Verma and V. Tomar, "An Investigation into Environment and Temperature Dependent Nanomechanical Properties of the Shallow Water Shrimp (Pandalus Platyceros) and Deep Sear Shrimp (Rimicaris Exoculata) Exoskeleton" TMS 2015, Orlando, FL, USA Mar. 15- 19, 2015

20. D. Verma and V. Tomar, "An Investigation into Environment and Temperature Dependent Nanomechanical Properties of Crustacean Exoskeleton of Shallow Water and Deep Sea Shrimps" SES 2014, West Lafayette, IN, USA Oct. 1- 3, 2014

21. D. Verma and V. Tomar, "An Investigation into Temperature Dependent Nanomechanical Properties of Crustacean Exoskeleton of Shallow Water Shrimps" EMI 2014, Hamilton Ontario, Canada Aug. 5-8, 2014

22. J. Pavón, D. Verma, M. Alucozai, R. Kempahia, J. P. Allain, V. Tomar, "Nanomechanical Behavior of Bacterial Nano-Cellulose (BNC) for Regenerative Vascular Treatments" EUROMAT, Sevilla, Spain Sep. 8-13, 2013

SKILLS

Experimental:

Nano-Micro Indentation (up to 750 C & in Liquid Cell)
Nano-impact/Scratch Tests, Fracture-Fatigue & Creep Tests,
Ion Milling for EBSD, TEM, slope cut
Raman Analysis and Spectroscopy
Scanning Electron Microscopy (SEM), Energy Dispersive X-ray (EDX)
Material Property Testing, Destructive and Analytical, Thermal
Electrospinning, Electrospraying, core shell fibers, particles
Nanoparticles spark ablation methods

Software:

ABAQUS (Standard & Explicit),
UMAT, VUMAT subroutine implementation
MATLAB, FORTRAN, Autodesk, Tecplot, SAS (Statistical analysis)
CRM software

PROFESSIONAL ACTIVITIES

- David Morrison "Writing Winning Grants" workshop
- Felder "Effective College Teaching" workshop
- Midwest Experimental Mechanics Student Conference, University of Michigan
- Lectures at Wabash Area Lifetime Learning Association, West Lafayette, IN
- Panelist for International Teaching Assistants, Purdue University
- Faculty Senate Student Affairs Committee
- College of Engineering Events Committee
- Provost's Outstanding Graduate Mentor Selection Committee
- Martin C. Jischke Outstanding International Student Selection Committee

SERVICE TO REFEREED JOURNALS

Editor

Recent Progress in Materials
Biomimetic Materials Design as an Inspiration to Additive Manufacturing (Special Issue)

Reviewer

Materials Science and Engineering A (Outstanding Reviewer)
Mechanics of Materials (Outstanding Reviewer)
Journal of Engineering Materials and Technology
Journal of Mechanical Science and Technology
International Journal of Experimental and Computational Biomechanics

PROFESSIONAL MEMBERSHIPS

ACS (The American Ceramic Society)
ASME (The American Society of Mechanical Engineers)
TMS (The Minerals, Metals & Materials Society)
Toastmasters International
Tau Beta Pi - The Engineering Honor Society

PROFESSIONAL LEADERSHIP EXPERIENCE

2020-present **Chapter Lead, Phoenix**
PANIIT USA

As the Alumni Chapter Lead, I orchestrated engaging social picnics, educational meetups, and dynamic networking events, fostering a vibrant community among alumni. My role involved coordinating logistics, curating enriching content, and creating opportunities for meaningful connections and professional growth.

2015-2016 **Vice President**
Purdue Graduate Student Government (PGSG)
Purdue University, West Lafayette, IN

I closely worked with President Mitch Daniels and other university executives on graduate student projects. I developed & implemented a new program 'PGSG Buddies' for international students to get

acclimated in multicultural environment of Purdue. I successfully executed a new program "International Student Housing" to provide temporary accommodation to incoming international students. I represented graduate students at Purdue Board of Trustees meetings. I act as a liaison to state representatives and city council of West Lafayette, IN.

2014-2015 **Secretary**
Purdue Graduate Student Government (PGSG)
Purdue University, West Lafayette, IN

I interfaced between graduate school and PGSG for effective communication and execution of events.

2013-2014 **Chair, Academic and Professional Development Committee**
Purdue Graduate Student Government (PGSG)
Purdue University, West Lafayette, IN

I organized Next Generation Scholars (NGS) and mentorship programs for graduate students.

2012-2014 **Leader, Boiler Out**
Office on International Programs
Purdue University, West Lafayette, IN

I led volunteering groups/teams of 8 to 40 students in the Greater Lafayette serving in Food Banks, Winter cleanup, high school volunteering etc.

2012-2014 **Aero Assist**
School of Aeronautics and Astronautics
Purdue University, West Lafayette, IN

I mentored and organized events to increase interaction between graduate and undergraduate AAE students and professors.

MEDIA COVERAGE

1. Advanced-composites-may-borrow-designs-from-deep-sea-shrimp, http://goo.gl/ij5LSv
2. Extreme shrimp studied as models for new materials, http://goo.gl/ThgI22
3. New-analytical-technology-reveals-nanomechanical-surface-traits, http://goo.gl/cxSjAn
4. Featured on Purdue College of Engineering webpage, https://goo.gl/m4le5i
5. Featured as Boilers of Purdue University, https://bit.ly/2s9v9sr