# HUSSAIN R. RIZVI

syedhussainrazarizvi@gmail.com | 940-735-8207 | linkedin.com/in/hussain-rizvi |

**MECHANICAL ENGINEER**

**Research & Development | Polymer Composites | Six Sigma Green Belt**

Energetic, results-driven professional with 4+ years of comprehensive experience in high performance, multi-functional polymer composites with an emphasis on establishing a processing-structure-property relationship. Experimental and computational methods expertise in mechanical and thermal investigation, material modeling and microstructure characterization. Proven skills in problem-solving and analytical thinking, thrive in both collaborative and leadership roles.

## CORE COMPETENCIES

Composites ♦ Polymers ♦ Carbon fibers ♦ Finite Element Analysis ♦ Mechanical Testing ♦ AutoCAD ♦ ANSYS Solidworks ♦ Characterization ♦ Raman Spectroscopy ♦ FTIR ♦ X-Ray Diffraction ♦ Nanoindentation ♦ DMA ♦ Electron Microscopy ♦ Corrosion-resistive coatings ♦ $CO_2$ Foaming ♦ Electrospinning ♦ Design of Experiments (DOE) ♦ Matlab

## EXPERIENCES & ACHIEVEMENTS

POLYMER MECHANICAL AND RHEOLOGY LAB - UNT, Denton, TX — Sep 13 - Present

*Researcher*

- Investigated a novel biological precursor (poly caffeyl alcohol) for carbon fibers and it's potential use as a conductive fabric.
- Design a methodology for comparative analysis of carbon fiber precursors (poly caffeyl alcohol & poly acrylonitrile) and its blends to determine the effect on the spinability, miscibility, chemical crosslinking and thermal properties of precursor fibers.
- Developed a cause- effect relationship utilizing DOE technique to correlate the processing parameters of carbonization step to the conductivity of the fiber.
- Design and manufacture hierarchical bioinspired porous foam fiber architecture which provides concurrent stiffness and damping benefits.
- Electrospun coaxial fibers of biodegradable polymers and generate porosity using super critical $CO_2$ foaming for drug delivery application.
- Developed corrosion resistive biocompatible and biodegradable coatings from a clay-polymer composition for applications in medical and polymer films industry.
- Developed Lab sessions for Manufacturing processes class and trained students on injection molding, compression molding and extrusion forming techniques.
- Mentor undergraduate senior design groups and interns on multiple projects. Facilitator and trainer for middle and high school teachers during summer, an integral part of NSF project.

MECHANICAL & ENERGY ENGINNERING – UNT, Denton, TX — Jan 18- Aug 18

*Adjunct Faculty*

- Integrating learning strategies to in class instruction of Statics, Mechanics of Materials & Control System. Efficiently teaching 18- credit hours of academic load for the spring semester.

ENGINEERING & PHYSICS DEPARTMENT - UCO, Edmond, OK — Aug 17 - Jan 18

*Lecturer*

- Instructed Dynamics & Material Science courses to sophomore and junior engineering students and general physics to a class of non-engineering students as a prerequisite for medical school.
- Effectively incorporating transformative learning strategies to in-class and lab instruction.

NED UNIVERSITY OF ENGINEERING & TECH - Karachi, Pakistan — Jan 11 - Aug 13

*Lecturer- Biomedical Engineering*

- Instructed Statics, Dynamics, and Strength of Material courses and provide academic advising to a class of 70+ students. Member of Departmental Committee dealing with employee and managerial concerns.
- Develop and implement (QMS) procedures and documentation. Conducted Internal Audits to monitoring the effectiveness of the Quality Assurance process.

SIEMENS PAKISTAN ENGINEERING CO. LTD - Karachi, Pakistan — July 10 - Dec 10

*Student Internee – Healthineers*

- Hands-on onsight installation and troubleshooting experience of medical devices including Gamma Camera, CT-Scan & MRI systems.

## EDUCATION & CREDENTIALS

Ph.D., *Mechanical & Energy Engineering*, University of North Texas, Denton, TX
Dissertation: Design of Bioinspired Conductive Smart Textile

MS, *Mechanical & Energy Engineering*, University of North Texas, Denton, TX
Thesis: Bioinspired and biocompatible coatings of poly(butylene adipate-co-terephthalate) and layer double hydroxide composites for corrosion resistance.

BE, *Biomedical Engineering*, NED University of Engineering & Technology, Karachi, Pakistan

## PUBLICATIONS

- Oluwabunmi, K., **Rizvi, H.**, D'Souza, N., Nazrazadani, S., Sanders, S., Hemmati, V., & Argade, G. (2018, July 20). Bio-Inspired PBAT/LDH Coatings for Corrosion Protection. NACE International.
- Xia, Changlei, Andres C. Garcia, Sheldon Q. Shi, Ying Qiu, Nathaniel Warner, Yingji Wu, Liping Cai, **Hussain R. Rizvi**, Nandika A. D'Souza, and Xu Nie. 2016. Hybrid boron nitride-natural fiber composites for enhanced thermal conductivity. Scientific Reports 6 (10/05): 34726, http://dx.doi.org/10.1038/srep34726.
- Nar, M., **Rizvi, H. R.**, Dixon, R. A., Chen, F., Kovalcik, A., & D'Souza, N. (2016). Superior plant based carbon fibers from electrospun poly-(caffeyl alcohol) lignin. Carbon, 103, 372-383. doi:http://dx.doi.org/10.1016/j.carbon.2016.02.053
- Xia, C., Zhang, S., Shi, S. Q., Cai, L., Garcia, A. C., **Rizvi, H. R.**, et al. (2016). Property enhancement of soy protein isolate-based films by introducing POSS. International Journal of Biological Macromolecules, 82, 168-173. doi:http://dx.doi.org/10.1016/j.ijbiomac.2015.11.024
- **Hussain R. Rizvi**, Nandika Anne D'Souza "Design of a Multifunctional Porous Coaxial Electrospun Mesh Using Poly-caprolactone (PCL) & Poly butylene adipate-co-therepthalate (PBAT)", Proceedings of the ASME 2016 International Mechanical Engineering Congress and Exposition, IMECE2016, November 11-17, 2016, Phoenix, Arizona, USA (**2nd Place Student Paper Competition**)
- **Hussain R. Rizvi**, Seifollah Nazrazadani, Reza Mirshams, Adel Mohamed, Teresa Golden, Nandika Anne D'Souza "Corrosion Resistant BIO-Inspired Coatings", The Composites and Advanced Materials Expo (CAMX), October 26th-29th 2015, Dallas, Texas
- **Hussain R. Rizvi**, Alicia D'Souza, Mickey Richardson,Tre Welch, Nandika D'Souza "Fabrication of Biocompatible Poly (butylene adipate-co-terephthalate) PBAT Coating for Biomedical Applications", SPE ANTEC™ Orlando 2015.
- **Hussain R. Rizvi,** Yoni Mercier, Thunyatorn Pukkrueapun, Sujitra Nonting, Nandika D'Souza "Mechanical And Thermal Properties of Coaxial Electrospun Fibers Mesh of PCL-PBAT" , SPE ANTEC™ Orlando 2015.
- **Hussain R. Rizvi**, Seifollah Nazrazadani, Reza Mirshams, Adel Mohamed, Teresa Golden, Nandika D'Souza, "Mechanical Properties of a Bioinspired PBAT/LDH Coating Using Single and Multi-Cycle Nanoindentation Technique" , Fifth International Indentation Workshop (IIW5), November1-5, 2015, Dallas, Texas.

## PROFESSIONAL SOCIETIES

- SPE UNT student chapter ( 2014 - 2017 ) Chapter Treasure 2014-2015
- SAMPE UNT student chapter ( 2014 - 2017 )
- Member of ASME