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Associate Professor

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Education

2008 – 2012 Doctor of Philosophy from The School of Engineering, University of Ulster, UK

Title: *Gold on Elastomer Stretchable Conductors Using Interfacial Interlayers and Carbon Nanotubes*

Supervisor: Dr. Patrick Lemoine, Head Nanolayers Characterization Research Group (p.lemoine@ulster.ac.uk)

2006 – 2008 Masters of Science Metallurgical Engineering & Material Science, University of Engineering & Technology, Lahore, Pakistan

Project: *Preparation of Orthodontic Brackets by Metal Injection Molding Technique*

Supervisor: Dr. Yousaf Anwar (my_anwar@yahoo.com)

1997 – 2001 Bachelor of Science in Engineering Metallurgy & Material Science, University of Punjab, Lahore, Pakistan,

Project: *The Production of Hundred Castings of Brake Discs RR of Toyota Corolla Car*

Supervisor: Prof. Dr. Taqi Zahid Butt (mtzbutt@hotmail.com)

Process Report: *Study of Cracking in the Weldment of a Strip Condensate Vessel used in Fertilizer Plant.*

Supervisor: Prof. Dr. Taqi Zahid Butt (mtzbutt@hotmail.com)

Research Funding

- Successfully won **British Council Researchers Link Travel Grant 2015** worth GBP 5600 against a research project on “*The study of force and IV curves of graphene oxide and reduced graphene oxide by AFM using Tapping, Conducting and TUNA modes*”
- Successfully won **Higher Education Commission of Pakistan HEC** funded research grant PKR 0.5 million (2014)
- Successfully won **University of the Punjab** research grant PKR 0.15 million for each year (2015, 2017 & 2019)

International Workshop

- Officially attended & participated in Ministerial Workshop on Mechanism of Renewable Energy Utilization & Development for Developing Countries, organized by Hunan International Business Vocational College, Sponsored by Ministry of Commerce of the People’s Republic of China from 14th to 23rd October, 2019 in Changsha, China

Professional Certification

- Successfully completed CAP module 1, “*Developing higher education practice*” of Certificate in Academic Practices CAP 2014
Instructor: Dr. Tony Luxon (a.luxon@lancaster.ac.uk)

Professional Experiences:

- *December 2020 – present as Associate Professor:* Institute of Metallurgy & Material Engineering, Faculty of Chemical & Materials Engineering, University of the Punjab, Lahore, Pakistan:
 - Controller of Examination of Institute of Metallurgy & Material Engineering
 - Developing a lab of Biomaterials
 - Teaching Materials Characterization, Advanced Materials, Surface Engineering & Tribology, Mechanics of Materials & Materials Thermodynamics & Kinetics to undergraduate students, Coating Techniques & Characterization Techniques to post graduate students and Surface Engineering, Research Methodology and Nanomaterials as an elective course to PhD students
- *July 2014 – December 2020 as Assistant Professor:* Department of Metallurgy & Material Engineering, College of Engineering & Emerging Technologies, University of the Punjab, Lahore, Pakistan:
 - Developing a lab of Biomaterials
 - Focal Person of QEC for Faculty of Engineering & Technology, University of the Punjab
 - Focal Person of ORIC for Faculty of Engineering & Technology, University of the Punjab
 - Focal Person of Student Management System (SMS) for Department of Metallurgy & Materials Engineering, University of the Punjab, Lahore
 - Teaching Materials Characterization, Advanced Materials, Surface Engineering & Tribology, Mechanics of Materials & Materials Thermodynamics & Kinetics to undergraduate students, Coating Techniques & Characterization Techniques to post graduate students and Surface Engineering, Research Methodology and Nanomaterials as an elective course to PhD students
 - Fully responsible for all aspects of course development, instruction, and assessment
 - Supervising final year students in their final year research projects
 - Research responsibilities include carrying out research, writing research proposals, engage research associates and final year students in research projects
 - Established a new research group within the department, of Thin films composites and Surface Engineering and coatings.
 - Successfully implementing research and management experience gained at Ulster in establishing the department at PU
 - Coordination with other research groups within the department
 - Other responsibilities include departmental administrative duties like member of Pakistan Engineering Council (PEC) Accreditation committee, Member of Final Year Project

committee, Member of Curriculum Design Committee at under graduate and post graduate level etc.

- *January 2013 – July 2014 as Assistant Professor:* COMSATS Institute of Information Technology, Lahore, Pakistan:
 - COMSATS-Lancaster Dual Degree Programme (DDP) Faculty Member
 - Teaching responsibilities include conduction of lectures of Thermodynamics-I for undergraduate and Advanced Thermodynamics for post graduate students
 - Teach couple of classes of 45 undergraduate students each semester. Fully responsible for all aspects of course development, instruction, and assessment
 - Supervising final semester students in their final year research projects
 - Research responsibilities include carrying out research, writing research proposals, engage research associates and final year students in research projects
 - Other responsibilities include departmental administrative duties
- *2008 – 2012 as Research Assistant:* The Nanotechnology and Integrated Bioengineering Center (NIBEC), University of Ulster:
 - Carrying experimental research for PhD project and consultancy with Valspar paint, PowerCem Technologies and Schrader.
 - Extensive research on a-C:H as an interlayer based stretchable conductors, CNT/PDMS composites based stretchable conductors. These involve nanoscale fabrication and characterization
 - Looking after instrumental equipment (ordering of consumables, routine maintenance, repair, etc.)
 - Training other researchers on deposition and characterization equipment
 - Supervising fourth year students and M.Sc. student in their final year research projects
 - Teaching in laboratories and tutorials in the School of Engineering to undergraduate and master's students
- *2005 – 2008 as Research Engineer:* Pakistan Council for Scientific & Industrial Research, Lahore:
 - Carrying research on the production of thin ceramic coatings (TiN, TiAlN, DLC, CrN) by PVD deposition and their characterization using AFM microscopy, Nanohardness/nanoscratch testing, surface profilometry, XRF spectroscopy.
 - Supervision of engineers and technicians, results interpretation, report writing, clients dealing and administrative duties.
 - Organization of international symposiums (21st Century's Materials – Testing Trends and Role of PCSIR, 2006 Lahore, 2nd Int. Conf. on Frontiers of Adv. Eng. Materials (FAEM) 2006 Lahore, 2nd Meeting of APCTT & Workshop on National Innovation System, 2006 Lahore)

Scientific and Professional Skills:

- *Material Preparation:* Thin Hydrogenated amorphous carbon (a-C:H) films deposited by PECVD, Magnetron Sputtered gold films, Conducting and Non-conducting thin films,

Nano-composite coatings by PVD deposition, conducting CNT/PDMS composites (solution & melt processing, dispersion methods), Photolithography with mask aligners, spin coating, RF plasma etching, experience of working in clean room environment.

- *Material Analysis*: AFM of graphene oxide and reduced graphene oxide, XRF spectroscopy, XPS Spectroscopy, Raman Spectroscopy, FTIR Spectroscopy, UV-Vis Spectroscopy, AFM and SEM microscopy, EDX analysis, Contact profilometry, Photolithography, Etching, Deep Level Transient Spectroscopy (DLTS), Tensile and Fatigue Electrical Measurement, Nanohardness/nanoscratch testing, Thermo Gravimetric analysis (TGA), Design of experiments, Maintenance of personal and official lab book, uses of data and image handling softwares such as Origin, Image J and FEA Modelling.
- *Non-Scientific Skills*: I attended specific courses in project management and have also had opportunity to apply these skills while undergoing my PhD research and working with companies (Valspar paint, PowerCem Technologies and Schrader) on short consultancy projects. I also acted as student support contact point for international students.

Award & Memberships

- Vice Chancellor's Research Scholarship doctoral award worth £40,000
- Member of Institute of Nanotechnology, UK
- Professional Engineer, registered at Pakistan Engineering Council
- British Council Researchers Link Travel Grant worth £5600

Journal Publications

- F. Hussain, M. U. Manzoor, M. Kamran, M. T. Z. Butt, "*Surface Modification of AZ31B Magnesium Alloy by Anodization process*", Journal of Pakistan Institute of Chemical Engineers, Vol. 49, No.1 (2021).
- H. Sajjad, M. U. Manzoor, H. Zafar, K. Shahzad, F. Hussain, "*Effect of Tribological and Electrochemical Properties of AlTiN Coating for Medical Application*", Journal of Pakistan Institute of Chemical Engineers, Vol. 49, No.1 (2021).
- S. S. Raza, M. U. Manzoor, F. Hussain, T. Ahmad, F. Riaz, "*Synthesis and Characterization of Nano Hydroxyapatite from Waste Egg Shells for Orthopedic and Dental Applications*", Journal of Pakistan Institute of Chemical Engineers, Vol. 48, No.2 (2020).
- M. U. Manzoor, F. Hussain, H. Zafar, H. Sajjad, A. Salman, F. Riaz, A. Farooq, T. Ahmad, M. Kamran, "*Electrochemical Characterization of AlTiN Coating on Stainless Steel Substrate for Biomedical Implant*", Journal of Pakistan Institute of Chemical Engineers, Vol. 48, No.2 (2020).
- M. A. Rafiq, A. Maqbool, I. H. Khan, M. U. Manzoor, A. Shuaib, A. S. Hakeem, "*A facile and cost-effective approach for the fabrication $Bi_{0.5}Na_{0.5}TiO_3$ thick films on flexible substrate for energy storage capacitor applications*", Ceramics International, 46, 16, 2020.

- M. A. Rafiq, Q. K. Muhammad, M. Waqar, A. Maqbool, M. A. Hussain, M. U. Manzoor, “High temperature A.C. conductivity analysis of ZnO nanoparticles doped BaZr_{0.15}Ti_{0.85}O₃ relaxor ceramics”, Physica B: Condensed Matter, 587, 412147, 2020.
- S. S. Raza, T. Ahmad, M. Kamran, X. Zhang, M. A. Basit, M. U. Manzoor, A. Inam, O. M. Butt, M. Abrar, “Effect of hot rolling on microstructures and mechanical properties of Ni base super-alloy”, Vacuum ,174, 109204, 2020.
- Y. X. Yan, T. Ahmad, X. Zhang, T. Liang, S. U. Rehman, M. U. Manzoor, W. Liu, M. A. Basit, “Microstructure, Hardness and Corrosion Behaviour of Ni-Ti Alloy with the Addition of Rare Earth Metal Oxide (Gd₂O₃)”, Materials Research Express, Vol 6, 076513, 2019.
- T. Ahmad, S. U. Rehman, J. Liu, X. Zhang, M. U. Manzoor, M. H. Abbas, H. M. A. Asghar, “Characterization of Epoxy Based Coating Reinforced with Nanoparticles of Silica Sand”, Journal of the Chinese Advanced Materials Society, Vol 6, No. 4, 2018.
- T. Ahmad, S. S. Raza, M. Kamran, M. U. Manzoor, A. Salman, “Studying the Effect of Variation in Volume Fractions of Carbon Fibres on Mechanical and Electrical Properties of Copper Based Composites”, Journal of Fundamental and Applied Sciences, Vol. 10, No. 2, 2018.
- S. S. Raza, T. Ahmad, M. Kamran, M. U. Manzoor, A. Salman, B. Ahmad, R. S. Wattoo, N. Riaz, “Evaluation of Effects of Change in Length of Carbon Fibers on the Properties of Aluminum Based Composite”, International Journal of Science and Qualitative Analysis, Vol. 4, No. 3, 2018
- T. Ahmad, A. N. Malik, S. S. Raza, M. Kamran, M. U. Manzoor, A. Salman, F. Hussain, F. Riaz, R. Ahmad, M. N. Akhtar, “Thermal, Electrochemical and Mechanical Properties of Shape Memory Alloy Developed by a Conventional Processing Route”, Journal of Fundamental and Applied Sciences, Vol. 9 No. 2, 2017.
- T. ahmad, S. S. Raza, E. Aleem, M. Kamran, M. U. Manzoor, A. Makhdoom, R. Ahmad “Improvement in Mechanical and Thermal Properties of Unsaturated Polyester Based Hybrid Composites”, Iran Polym J, Vol. 06, No. 63, 2017
- S. S. Raza, T. Ahmad, M. U. Manzoor, M. Kamran, R. Ahmad, “Analysis of Metallurgical Aspects and Their Role in Processing and Performance of Super-alloys: A Review”, Journal of Fundamental and Applied Sciences, Vol. 9, No. 1, 2017.
- T. ahmad, S. Mukhtar, M. Kamran, M. U. Manzoor, “Studying the Effect of Aluminum Coating on Stainless Steel 316L and Alpha Iron”, Journal of Faculty of Engineering and Technology, Vol. 23, No. 2, 2016.
- T. Ahmad, M. Kamran, M. U. Manzoor, “The Development and Characterization of Glass Fiber-Silica Sand Nanoparticles Reinforced Hybrid Composites”, Journal of Faculty of Engineering and Technology, Vol. 23, No. 2, 2016.
- M. U. Manzoor, P. Lemoine, D. Dixon, J. W. J. Hamilton and P. D. Maguire, “Stretchable conducting gold films prepared with composite MWNT/PDMS substrates ”, AIP Advances 5, 10, p107237, 2015.
- F. Riaz, T. Ahmad, M. Kamran, M. T. Munir, F. Hussain, M. U. Manzoor, R. Ahmad, “The Production & Characterization of Ultrafine Grained Metal Sheets Produced by Accumulative Roll Bonding Process”, Journal of Pakistan Institute of Chemical Engineers, Vol. 43, No.2, pp.1-8, 2015.

- T. Ahmad, M. Kamran, B. A. Wahjoedi, M. T. Z. Butt, M. U. Manzoor, Z. Abbas, “*The Beneficiation of Thal Silica Sand and the Production of High grade Silicon*”, Journal of Faculty of Engineering & Technology, Vol. 22, No.2, 2015.
- M. U. Manzoor, C. L. Tuinea-Bobe, F. McKavanagh, C. P. Byrne, D. Dixon, P. D. Maguire and P. Lemoine, “*Amorphous carbon interlayers for gold on elastomer stretchable conductors*”, IOP J. Phys. D: Appl. Phys. 44, 245301, 2011.
- C. L. Tuinea-Bobe, P. Lemoine, M. U. Manzoor, M. Tweedie, R. A. D'sa, C. Gehin and E. Wallace, “*Photolithographic structuring of stretchable conductors and sub-kPa pressure sensors*”, IOP J. Micromech. Microeng. 21 115010, 2011.

Editor

- Editor of the Journal of Faculty of Engineering & Technology (JFET), Faculty of Engineering & Technology, University of the Punjab, Lahore, Pakistan

Presentations

- ERI Student Conference 2012, University of Ulster, UK in January 2012.
- E-MRS 2011 Fall Meeting, Warsaw, Poland in September 2011.
- Material's Ireland 3rd International Conference, Dublin in December 2010.

Conference Proceeding & Poster Presentations

- Electrochemical characterization of titanium based graphene nano composites, M. U. Manzoor, T. Ahmad, M.T.Z. Butt, M. Kamran, Materials Innovation in Surface Engineering, MISE 2020, February 11-12, 2020, Swinburne University, Melbourne, Australia.
- The Development & Characterization of Mechanically Exfoliated Graphite Based Counter Electrode for Natural Dye Sensitized Solar Cell (DSSC), M. U. Manzoor, M. T. Z. Butt, T. Ahmad and M. Kamran, Materials Science and Technology 2018 (MS&T18), October 14-18, 2018, Greater Columbus Convention Center, Columbus, Ohio, USA
- Electro Chemical Characterization of Mechanically Exfoliated Graphite Based Organic Dye Sensitized Solar Cell (DSSC), M. T. Z. Butt, M. U. Manzoor, T. Ahmad and M. Kamran, Materials Science and Technology 2018 (MS&T18), October 14-18, 2018, Greater Columbus Convention Center, Columbus, Ohio, USA
- The development and mechanical characterization of aluminium copper-carbon fiber metal matrix hybrid composite, M. U. Manzoor, M. Feroze, T. Ahmad, M. Kamran, and M. T. Z. Butt, AIP Conference Proceedings 1957, 030003 (2018); doi: 10.1063/1.5034327
- The Development and Mechanical Characterization of Aluminium Copper-Glass Fiber Metal Matrix Hybrid Composite, M. U. Manzoor, H. Zaidi, A. Nadeem, Z. Ali, T. Ahmad, M. Kamran, R. Ahmad, European Materials Research Society (e-MRS 2017) Spring Meeting, May 22-26, 2017, Strasbourg, France.
- Study of Addition of wt.% Ratio of Silica Sand Nanoparticles on Aluminium-Carbon Fibers Hybrid Composites, M. T. Z. Butt, T. Ahmad, M. Kamran, M. U. Manzoor, European

Materials Research Society (e-MRS 2017) Spring Meeting, May 22-26, 2017, Strasbourg, France.

- Electrochemical characterization of PVD coated AlTiN on stainless steel substrate for biomedical implant, M. U. Manzoor, A. Salman, T. Ahmad, M. Kamran, A. Farooq, H. Sajjad, Advancing Materials and Manufacturing: CAMS2016, December 6-8, 2016, Swinburne University, Melbourne, Australia.
- Studying the effect of carbon fiber-silica sand nanoparticles on copper based hybrid composites, T. Ahmad, M.T.Z. Butt, M. Kamran, M. U. Manzoor, Advancing Materials and Manufacturing: CAMS2016, December 6-8, 2016, Swinburne University, Melbourne, Australia.
- Sliding Friction behavior of Aluminum based Hybrid Composites, T. Ahmad, M. Bashir, M. Kamran, R. Ahmad, M. U. Manzoor, Materials Science and Technology 2016 (MS&T16), October 23-27, 2016, Salt Palace Convention Center, Salt Lake City, Utah USA pp. 899-905.
- Synthesis and characterization of nano-hydroxyapatite powder for orthopedic and dentistry applications, S.A. Ali, W. Jamal, W. Khaliq, M. U. Manzoor, 2nd International Conference on Engineering Sciences 2015, Punjab University, Lahore
- AlTiN coating deposition and characterization on stainless steel substrate by PVD coating technique, H. Sajjad, H. Zafar, N. Ali, M. U. Manzoor, 2nd International Conference on Engineering Sciences 2015, Punjab University, Lahore
- Amorphous carbon interlayers for gold on elastomer stretchable conductors, M. U. Manzoor, C.T-Bobe, P. Lemoine, European Materials Research Society (e-MRS 2011) Fall Meeting, September 19 -23, 2011, Warsaw, Poland
- Faculty of Computing and Engineering Annual Research Meeting, UK in March 2011
- The development and characterization of thin film based elastomer stretchable conductors, M. U. Manzoor, C.T-Bobe, P. Lemoine, Material's Ireland 3rd International Conference, 13-14 December 2010, Dublin, Republic of Ireland
- 2nd International Workshop on Flexible & Stretchable Electronics, Ghent, Belgium in November 2009.
- Proceedings of the Second International Conference on Frontiers of Advanced Engineering Materials (FAEM), PCSIR Labs, Lahore, Pakistan in December 2006.
- Silver Jubilee Seminar of PIMME on Metallurgy and Engineering Materials, Lahore, Pakistan in 2001.

References

Dr. Patrick Lemoine, Lecturer (p.lemoine@ulster.ac.uk)

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