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Mechanical Engineering Department,

University Institute of Engineering & Technology(U.I.E.T.),

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**International Awards**

- Commonwealth Rutherford Post-Doctoral fellow, Nottingham Trent University, Nottingham, United Kingdom (2018)
- Platinum Award at CII MILCA Academia Awards (2020)

Research Interests

Mechanical characterization, rapid prototyping, nano-bio-composite materials, dental/facial prosthesis & diagnostic medical devices,

Work Experience

Institution/Company	Designation	Period
University Institute of Engineering & Technology (UIET), Panjab University(PU), Chandigarh, INDIA	Assistant Professor	(Sep, 2008 – Till Date)
Nottingham Trent University (NTU), Nottingham, United Kingdom	Commonwealth Rutherford Fellow	(March, 2018- Dec-2018)
Perot Systems, Noida, India	Software Developer	(June, 2006 – July,2008)
Chandigarh College of Engineering & Technology, Chandigarh, India	Lecturer	(Feb,2003 - July,2003)
Larsen & Toubro Ltd, Bengaluru, India	Marketing Executive	(Sep, 2002 – Dec, 2003)

Academic Background

Examination/Degree	Institution	Year of Passing	% Marks
Ph.D. (Faculty of Engineering & Technology) <i>(Title- 'Evaluation of dynamic and static strength of carbon nanotubes based composites and coated materials')</i>	Panjab University, Chandigarh	2014	-
M.E. (Mechanical Engineering)	Punjab Engineering College, Chandigarh	2006	79.6
B.E. (Mechanical Engineering)	Punjab Engineering College, Chandigarh	2002	70.7

Patents

1. Granted Patent No.371489, Application No. 202011028427, Filing Date- 03/07/2020. Title of the Invention-WEARABLE APPARATUS FOR DETERMINING GONIOMETRIC READINGS OF A BODY PORTION OF A SUBJECT,

Funded research Projects

1. Principal Investigator for the project title-“ Heat transfer optimization for Li-ion battery packs for enhanced performance of BTMS *,funded under Nottingham Trent University(UK)-PU R&D partnership, 2021 to 2024(for 7000 GBP ₹7,00,000/-)*
2. Co-Investigator for the project title-Designing of craniofacial implants using clinically relevant materials, funded under *Nottingham Trent University(UK)-PU R&D partnership, 2021 to 2024(for 6500 GBP ₹6,50,000/-)*
3. Co-Investigator for the project title-“Centre for Bio-mechanical engineering and medical devices,” Fund for Improvement of S&T(FIST) *funded by DST, New Delhi, 2020 to 2024 (for \$193,000/- ₹123,00,000/-)*
4. Principal Investigator for the sub-theme title-“Medical Devices and Restorative Technologies,” Design Innovation Centre *funded by MHRD, New Delhi, 2015 to 2026 (for \$225,000/- ₹150,00,000/-)*

5. Principal Investigator for the project title-“Development and characterization of polycarbonate and glass CNT with specific reference to energy absorption and pressure sensing characteristics,” *funded by ARMREB, DRDO, New Delhi*, 2011 to 2015 (for \$ 22,500/- ₹15,00,000/-)

List of publications in Journals

1. A. Dhawan and **P. Jindal**, “Mechanical behavior of carboxylic functionalized graphene reinforced polyurethane nanocomposites under static and dynamic loading,” *Polymer Composites* (ACCEPTED) (IMPACT FACTOR- 3.17)
2. D. Kumar, S. A. Bansal, N. Kumar, and **P. Jindal**, “Two-step synthesis of polyurethane/multi-walled carbon nanotubes polymer composite to achieve high percentage particle reinforcement for mechanical applications,” *Journal of Composite Materials*, p. 0021998321999451, 2021. (IMPACT FACTOR- 2.59)
3. P. Gupta, S. Kumari, A. Gupta, A. K. Sinha, and **P. Jindal**, “Effect of heat treatment on mechanical properties of 3D printed polylactic acid parts,” *Materials Testing* vol. 63, no. 1, pp. 73–78, 2021. (IMPACT FACTOR- 1.59)
4. M. Juneja, P. Garg, R. Kaur, P. Manocha, S. Batra, P. Singh, S. Singh and **P. Jindal** “A review on cephalometric landmark detection techniques,” *Biomedical Signal Processing and Control*, vol. 66, p. 102486, 2021. (IMPACT FACTOR- 3.88)
5. A. Dhawan and **P. Jindal**, “A review on use of polyurethane in Lighter than Air systems,” *Materials Today: Proceedings* vol. 43, pp. 746–752, 2021.
6. A. Dhawan and **P. Jindal**, “Thermal characterization of carboxylic functionalized graphene reinforced polyurethane nanocomposite,” *Materials Today: Proceedings* vol. 28, pp. 1679-1682, 2020.
7. **P. Jindal**, F. Worcester, F. L. Siena, C. Forbes, M. Juneja and P. Breedon “Mechanical behaviour of 3D printed vs thermoformed clear dental aligner materials under non-linear compressive loading using FEM.” *Journal of the Mechanical Behavior of Biomedical Materials*, vol. 112, p.10405, 2020 (IMPACT FACTOR- 3.90)
8. **P. Jindal**, M. Juneja, F. L. Siena, D. Bajaj and P. Breedon, “Effects of post curing conditions on the mechanical properties of 3D printed clear dental aligners,” *Rapid Prototyping Journal*. (ACCEPTED) (IMPACT FACTOR- 4.40)
9. M. Juneja, R. Singla, S.K. Saini, R. Kaur, D. Bajaj and **P. Jindal**, “OCLU-NET for occlusal classification of 3D dental models,” *Machine Vision and Applications*, vol. 31, no. 6 p. 52, 2020. (IMPACT FACTOR- 2.13)

10. M. Juneja, S. Thakur, A. Wani, A. Uniyal, N. Thakur, and **P. Jindal**, "DC-Gnet for detection of glaucoma in retinal fundus imaging," *Machine Vision and Applications*, vol. 123, p. 31:34, 2020. **(IMPACT FACTOR- 2.01)**
11. S. Kapoor, M. Goyal, and **P. Jindal**, "Effect of functionalized multi-walled carbon nanotubes on thermal and mechanical properties of acrylonitrile butadiene styrene nanocomposite," *Journal of Polymer Research*, vol. 27, no. 2, p. 40, Jan. 2020. **(IMPACT FACTOR- 3.09)**
12. S. Kapoor, M. Goyal, and **P. Jindal**, "Enhanced thermal, static and dynamic mechanical properties of multi-walled carbon nanotubes reinforced Acrylonitrile Butadiene Styrene nanocomposite." *Journal of Thermoplastic Composite Materials* **(ACCEPTED) (IMPACT FACTOR- 3.33)**
13. D. Kumar and P. Jindal, "Tensile, torsional and bending behavior of multi-walled carbon nanotube reinforced polyurethane composites," *International Journal of Plastics Technology*, vol. 23, no. 2, pp. 177–187, 2019.
14. **P. Jindal**, R. Ranjan, P. Garg, P. Raj, P. Kaur, V. Karan, I. Madhav and M. Juneja "Evaluation of Hand Movement Using IoT-Based Goniometric Data Acquisition Glove," in *Proceedings of International Conference on IoT Inclusive Life (ICIIL 2019)*, NITTTR Chandigarh, India, 2020, pp. 193–200.
15. M. Juneja, J. Chawla, S. K. Saini, D. Bajaj, and **P. Jindal**, "CoTusk: IoT-Based Tooth Shade Detecting Device," in *Proceedings of International Conference on IoT Inclusive Life (ICIIL 2019)*, NITTTR Chandigarh, India, 2020, pp. 201–207.
16. **P. Jindal**, M. Juneja, F.L. Siena, D. Bajaj, and P. Breedon, "Mechanical and geometrical properties of thermoformed and 3D printed clear dental aligners", *American Journal of Orthodontics & Dentofacial Orthopedics*, vol. 156, no. 5, pp. 694–701, 2019 **(IMPACT FACTOR- 2.65)**
17. D. Kumar and **P. Jindal**, "Effect of multi-walled carbon nanotubes on thermal stability of polyurethane nanocomposites," *Materials Research Express*, vol. 6, no. 10, p. 105336, Aug. 2019. **(IMPACT FACTOR- 1.62)**
18. A. Thakur, A. Manna, S. Samir, and **P. Jindal**, "Polymer nanocomposite reinforced with selectively synthesized coiled carbon nanofibers," *Composite Interfaces*, vol. 27, no. 2, pp. 215–226, 2020 **(IMPACT FACTOR- 2.95)**
19. M. Juneja, S. Singh, N. Agarwal, S. Bali, S. Gupta, N. Thakur and **P. Jindal**, "Automated detection of Glaucoma using deep learning convolution network (G-net)," *Multimedia Tools and Applications*, Apr. 2019. **(IMPACT FACTOR- 2.76)**
20. **P. Jindal**, F. Worcester, K. Walia, A. Gupta, and P. Breedon, "Finite element analysis of titanium alloy-graphene based mandible plate," *Computer methods in*

- biomechanics and biomedical engineering*, vol. 22, no. 3, pp. 324–330, 2019. **(IMPACT FACTOR- 1.76)**
21. **P. Jindal**, F. Worcester, A. Gupta, and P. Breedon, “Efficiency of nanoparticle reinforcement using finite element analysis of titanium alloy mandible plate,” *Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine*, , vol.233, no.3, pp.309-317, 2019. **(IMPACT FACTOR- 1.62)**
 22. D. K. Gill, K. Walia, A. Rawat, D. Bajaj, V. K. Gupta, A. Gupta, M. Juneja, R. Tuli, and **P. Jindal**, “3D modelling and printing of craniofacial implant template,” *Rapid Prototyping Journal* p. RPJ-12-2017-0257, Vol.25, No.2, pp.397-403, 2019 **(IMPACT FACTOR- 4.40)**
 23. M. Juneja, N. Thakur, D. Kumar, A. Gupta, B. Bajwa, and **P. Jindal**, “Accuracy in dental surgical guide fabrication using different 3-D printing techniques,” *Additive Manufacturing*, vol. 22, no. August 2018, pp. 243–255, 2018. **(IMPACT FACTOR- 10.9)**
 24. S. Arora, G. Saini, L. Singhal, P. Uniyal, N. Kumar, and **P. Jindal**, “Effect of Manufacturing Processes on Creep Modulus, Strain Rate and Residual Stress of Polymers,” *Journal on Material Science* , vol. 5, no. 4, pp. 47–54, 2018.
 25. D. Kumar, N. Kumar, and **P. Jindal**, “Effect of MWCNTs on damping behaviour of Polyurethane based nano-composites,” *Materials Today: Proceedings.*, vol. 5, no. 2, pp. 5636–5640, 2018.
 26. D. Bajaj, I. Madhav, M. Juneja, R. Tuli, and **P. Jindal**, “Methodology for Stress Measurement by Transparent Dental Aligners using Strain Gauge,” *World Journal of Dentistry*, vol. 9, no. 1, pp. 13–18, 2018.
 27. H. P. Singh, A. Chauhan, and **P. Jindal**, “Fabrication of Al2024/MWCNT Composite,” *Res. J. Eng. Technol.*, vol. 8, no. 3, pp. 191–194, 2017.
 28. **P. Jindal**, R. N. Yadav, and N. Kumar, “Dynamic mechanical characterization of PC/MWCNT composites under variable temperature conditions,” *Iranian Polymer Journal*, vol. 26, no. 6, pp. 445–452, 2017. **(IMPACT FACTOR- 1.89)**
 29. K. Kulshrestha, B. Thakur, Y. P. Verma, and **P. Jindal**, “Development of Small Pressure Sensing Unit using Nano-Materials,” *Materials Today: Proceedings.*, vol. 4, no. 9, pp. 10422–10426, Jan. 2017.
 30. N. Thakur, N. Chaudhary, M. Juneja, and **P. Jindal**, “Modeling and Printing of Successive Misaligned Teeth Stages,” *World Journal of Dentistry*, vol. 8, no. 4, pp. 309–314, 2017.

31. S. Bansal, N. Kumar, and **P. Jindal**, "Effect of MWCNT Composition on the Hardness of PP/MWCNT Composites," *Materials Today: Proceedings.*, vol. 4, no. 2, pp. 3867–3871, 2017.
32. D. Kumar, N. Kumar, and **P. Jindal**, "Elastic Modulus Behavior of Multi-Walled Carbon Nano-Tubes / Polyurethane Composites using Nano- Indentation Techniques," *Indian Journal of Science and Technology.*, vol. 10, no. 17, pp. 1–4, 2017.
33. S. Kapoor, M. Goyal, and **P. Jindal**, "Effect of Multi-Walled Carbon Nanotubes (MWCNT) on Mechanical Properties of Acrylonitrile Butadiene Styrene (ABS) Nano-Composite," *Indian Journal of Science and Technology.*, vol. 10, no. 17, pp. 1–6, 2017.
34. V. Sharma, M. Goyal, and **P. Jindal**, "Preparation , Characterization and Study of Mechanical Properties of Graphene / ABS Nano- Composites," *Indian Journal of Science and Technology.*, vol. 10, no. 17, pp. 1–5, 2017.
35. N. Thakur, M. Juneja, and **P. Jindal**, "Tooth / Teeth Segmentation and modeling from X-ray / CT images : A Survey," *International Journal of Control Theory and Applications*, vol. 10, no. 8, pp. 423–428, 2017.
36. M. Goyal, N. Goyal, H. Kaur, A. Gera, K. Minocha, and **P. Jindal**, "Fabrication and characterization of Low Density PolyEthylene(LDPE)/Multi Walled Carbon Nanotubes(MWCNTs) nano-composites," *Perspectives in Science*, vol. 8, pp. 3–5, 2016.
37. **P. Jindal**, J. Jyoti, and N. Kumar, "Mechanical characterisation of ABS/MWCNT composites under static and dynamic loading conditions," *Journal of Mechanical Engineering and Sciences (JMES)*, vol. 10, no. 3, pp. 2288–2299, 2016.
38. S. Singh, A. Kaur, and **P. Jindal**, "Mechanical Behaviour of MWCNT Reinforced Polymer Composites : A Review," *International Journal of Scientific Research*, vol. 4, no. 10, pp. 68–72, 2015.
39. **P. Jindal**, M. Sain, and N. Kumar, "Mechanical characterization of PMMA / MWCNT composites under static and dynamic loading conditions," *Materials Today: Proceedings*, vol. 2, no. 4–5, pp. 1364–1372, 2015.
40. S. Gairola, S. K. Pandey, S. S. Gupta, and **P. Jindal**, "Effect of MWCNT composition on the thermal conductivity behavior of PP /MWCNT composites," *International Journal of Mechanical And Production Engineering*, vol. 3, no. 9, pp. 21–24, 2015.
41. **P. Jindal**, S. S. Gupta, S. Bansal, S. Gairola, S. K. Pandey, A. P. Singh, and R. Bhandari, "Thermal Expansion Behaviour of PMMA / MWCNT Composites," *International Journal of Research in Mechanical Engineering & Technology* , vol. 4, no. 2, pp. 62–64, 2014.

42. **P. Jindal**, M. Goyal, and N. Kumar, "Mechanical characterization of multiwalled carbon nanotubes-polycarbonate composites," *Materials & Design*, vol. 54, pp. 864–868, 2014 (**IMPACT FACTOR- 7.99**)
43. **P. Jindal**, M. Goyal, and N. Kumar, "Role of carbon nanotubes in polycarbonate composites for modification in hardness," *International Journal of Nanoelectronics and Materials*, vol. 7, no. 2, pp. 85–91, 2014.
44. S. Jandial and **P. Jindal**, "Review of Carbon Nanotubes/Poly (methyl methacrylate) Composite Fabrication and Mechanical Characterization Techniques," *International Journal of Research in Advent Technology*, vol. 1, no. 2, pp. 92–94, 2014.
45. A. Chhibba and **P. Jindal**, "Mechanical Characterization of Varying Deposits of MWCNTs on Glass Surfaces under High Strain Rate Loading," *International Journal of Research in Advent Technology*, vol. 2, no. 5, pp. 147–151, 2014.
46. A. Chauhan, A. Singla, N. Panwar, and **P. Jindal**, "CFD based thermo-hydrodynamic analysis of circular journal bearing," *International Journal of Advanced Mechanical Engineering*, vol. 4, no. 5, pp. 475–482, 2014.
47. A. Chauhan, A. Singla, A. Chhibba, and **P. Jindal**, "Static Load Measurement Using Multi Walled Carbon Nanotubes," *International Journal of Advanced Mechanical Engineering*, vol. 4, no. 5, pp. 483–487, 2014.
48. **P. Jindal**, S. Pande, P. Sharma, V. Mangla, A. Chaudhury, D. Patel, B. P. Singh, R. B. Mathur, and M. Goyal, "High strain rate behavior of multi-walled carbon nanotubes–polycarbonate composites," *Composites Part B: Engineering*, vol. 45, no. 1, pp. 417–422, Feb. 2013 (**IMPACT FACTOR – 9.08**)
49. **P. Jindal**, M. Goyal, and N. Kumar, "Modeling Composites of Multi-Walled Carbon Nanotubes in Polycarbonate," *International Journal for Computational Methods in Engineering Science and Mechanics*, vol. 14, no. 6, pp. 542–551, Oct. 2013
50. **P. Jindal**, M. Goyal, and N. Kumar, "Dynamic Impact Absorption Behaviour of Glass Coated with Carbon Nanotubes," *Journal of Surface Engineered Materials and Advanced Technology*, vol. 3, no. October, pp. 257–261, 2013.
51. **P. Jindal**, "Compressive Strain Behaviour under Different Strain Rates in Multi-Walled Carbon Nanotubes-Polycarbonate Composites," *Journal of Material Science & Engineering*, vol. 02, no. 01, pp. 2–4, 2013
52. **P. Jindal** and V. K. Jindal, "Strains in axial and lateral directions in carbon nanotubes," *Journal of Computational and Theoretical Nanoscience*, vol. 3, no. 1, pp. 148–152, 2006.

53. **P. Jindal** and V. K. Jindal, “Model for compression of fullerenes and carbon nanotubes,” *Molecular Simulation*, vol. 31, no. 12, pp. 807–810, 2005.(**IMPACT FACTOR–2.18**)
54. I. S. Chopra, **P. Jindal**, and M. L. Sharma, “Production of Carbon Nanotubes using arc ignition of graphite in de-ionized water,” *Panjab University Research Journal(Science)*, vol. 55, pp. 39–41, 2005.

List of Books/Book chapters published

1. K. A. Singh, D. Kumar & **P. Jindal**, Influence of Graphene on Mechanical Behavior of EVA Composite at Low Strain Rate Loading. in *Advances in Materials Science and Engineering*, 2020, 261–270
2. D. Kumar & **P. Jindal**, Evaluation of Creep and Compressive Behavior of MWCNTs Reinforced Polyurethane Composites. in *Advances in Materials Science and Engineering*, 2020, 71–82
3. D. Bajaj, A. Rawat, D. K. Gill, M. Juneja, and **P. Jindal**, “Efficacy of Softwares for Generation of Dental Aligners,” in *Proceedings of 2nd International Conference on Communication, Computing and Networking*, 2019, pp. 783–794. ISBN: 9789811312175
4. A. Rawat, D. K. Gill, D. Bajaj, M. Juneja, A. Gupta, and **P. Jindal**, “Craniofacial Model Generation Using CAD/CAM Software,” in *Proceedings of 2nd International Conference on Communication, Computing and Networking*, 2019, pp. 795–803. ISBN: 9789811312175
5. D. K. Gill, D. Bajaj, A. Rawat, Y. G. Mittal, M. Juneja, and **P. Jindal**, “Dimensional Accuracy of Surgical Guides Fabricated from Different Materials Using 3D Printer,” in *Proceedings of 2nd International Conference on Communication, Computing and Networking*, 2019, pp. 805–813. ISBN: 9789811312175
6. **P. Jindal**, “*High Strain Rate Behavior of Nanocomposites and Nanocoatings*,” SpringerBriefs in Materials, 2014, ISBN: 978-3-319-14480-1
7. **P. Jindal**, “*Dimensional measurements and Poisson’s ratio of Carbon Nanotubes*,” LAP LAMBERT Academic Publishing, 2014, ISBN: 978-3-659-56207-5
8. Saurav Gairola, Amrinder Pal Singh, **P. Jindal**, “*Review of Thermal Characterization of Polymer-Carbon Nanotubes*”, Processing and Fabrication of Advanced Materials: XXIII, Volume-1, ISBN:978-93-84588-17-5
9. **P. Jindal**, Aditya Chhibba, Navin Kumar, “*Dynamic Mechanical Analysis of PMMA/MWCNT composites*”, Nanotechnology: Novel Perspectives and Prospects, ISBN(13):978-93-392-2109-6

Consultancies

1. Consultant for development of neuro hand glove medical devices with Tynor Orthotics Pvt. Ltd., Mohali, INDIA
2. In house consultancy facility at Panjab University for 3D printing on FDM and Stratasys Polyjet printer
3. Consultant for designing and fabrication of 3 axis milling machine with Esteem Industries Baddi, INDIA

International talks and lectures

1. “3D printing and its applications”, ATAL One week workshop on 3D printing and Design, at UIET, Panjab University, Chandigarh, INDIA, 25-20 Nov, 2019
2. “Effects of variable temperature conditions and loading frequency on mechanical properties of MWCNT/PC composites”, International Conference on Advanced Nanotechnology and Nanomaterials, Dubai, UAE, 20-21, Nov, 2019
3. “Innovative devices in the area of medical applications,” Technology Day, Panjab University, Chandigarh, INDIA, 3, June, 2019
4. “3D Printing for Medical Applications,” Indian Institute of Technology(IIT), Ropar, INDIA, 15, Jan, 2019
5. “3D Modeling and printing for biomedical devices and restorative materials”, INM, Leibniz Institute for New Materials, Saarbrücken, Germany, 3-5, Sep, 2018
6. “Mechanical characterization of PC/MWCNT composites under variable temperature conditions”, 26th Annual International Conference on Composites or Nano Engineering(ICCE-26), Paris, France, 15-21 July, 2018
7. “Storage Modulus variation for MWCNT/PC composites at different temperatures”, International Conference on Advanced Composite Materials(ACM 2015), Shanghai, China, 19-21 July, 2015
8. “Role of Carbon Nanotubes for pressure sensing applications”, Harnessing Engineering, Technology, and Innovation for Sustainable Growth (HETIS-2014), P.U. , Chandigarh, 19-20 September, 2014
9. “Dynamic and static mechanical strength of multi-walled carbon nanotubes polycarbonate composites”, 22nd Annual International Conference on Composites or Nano Engineering(ICCE-22), Malta, Europe, 13-19 July, 2014

10. “Modification of hardness of glass and polycarbonates by carbon nanotubes,” 4th Chandigarh Science Congress, CHASCON 2010 at P.U., Chandigarh, 19-20 March,2010

List of proceedings in Conferences

1. **P. Jindal**, et al, “Conceptualization of design and selection of a spanner to unscrew the wheels of a vehicle more efficiently and speedily,” National Conference on Advances in Mechanical Engineering at P.U., Chandigarh, 20-21 May,2011
2. **P. Jindal**, et al, “Design and Analysis of a Multi-headed multi-lever spanner to unscrew the wheels of a vehicle,” National Conference on Advances in Mechanical Engineering at P.U., Chandigarh, 20-21 May,2011
3. **P. Jindal**, et al, “Shock compression of Fullerenes and Carbon Nanotubes.,” The 25th International Symposium on shock waves-ISSW25 at IISc Bangalore, 17-22 July,2005

Workshops/Conferences organized

1. DIC workshop on Innovative Approach to Materials Research(IAMR-2016), 21-14 December-2016 at PEC University of Technology, (Formerly Punjab Engineering College) Chandigarh, India
2. ‘Innovation Contest’, 18-19 Sep-2017 at UIET, Panjab University, Chandigarh, INDIA
3. ‘3D Modeling and Printing Skill Development Workshop’, 21-23 Sep-2017 at UIET, Panjab University, Chandigarh, INDIA
4. ‘StartUp and Incubation Workshop in Medical Devices and Restorative Engineering’, 8-12 July-2019 at UIET, Panjab University, Chandigarh, INDIA
5. ‘International Conference on Aspects of Materials Science and Engineering (ICAMSE-2020)’, 29-30 May-2020 at UIET, Panjab University, Chandigarh, INDIA