Rajesh Nakka

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Education

Aug'2018 — Jul'2023 **Ph.D., Indian Institute of Science** in Aerospace Structures.
Prediction of multi-physical properties of fibre-reinforced composites using deep learning. In brief, it involved generating a large number of microstructure images, finite element homogenisation and building CNN models, with extensive use of Python and Julia languages.

Aug'2012 — Jul'2014 **M.Tech. Mechanical Engg., IIT Bombay** in Machine Design.
Finite Element Simulation of Bulk Wave Propagation in Non-Linear Solids. Enhancement of the second harmonic amplitude of waves travelling in non-linear media is studied using analytical methods and finite element simulations.

Aug'2008 — Jul'2012 **B.Tech. Mechanical Engg., JNTUH College of Engineering, Hyderabad.**

Employment History

Aug'2023 – Dec'2023 **Post-doctoral research (consultant)** in designing twin screw compressor rotor profile using generative learning at City, University of London. My role involves building and training the generative adversarial neural networks that can produce new rotor profiles.

Aug'2015 – Nov'2016 **Assistant Professor** at Mechanical Engineering Department, Bapatla Engineering College, India. I enjoyed teaching the mechanics of materials course for undergraduate students in two semesters.

Aug'2014 – July'2015 **PGET** Post Graduate Engineer Trainee at Mahindra Research Valley, Mahindra & Mahindra, Chennai, India.

Skills

Coding languages	Python (4/5), Julia (4/5), LaTeX (4/5), Git (3/5), …
FEA softwares	Abaqus, gmsh, FreeCAD, ANSYS APDL,
Deep learning Frameworks	PyTorch, TensorFlow
Misc.	Asymptote: The Vector Graphics Language,
Languages	English, Telugu and Hindi.

Research Publications

Journal Articles

1 P. K. Attada, **Rajesh Nakka**, D. harursampath, and S. A. Ponnusami, "Computational evaluation of absorption characteristics ofceramic-based auxetic materials in x-band frequencyrange," *Smart Materials and Structures*, Aug. 2023. DOI: 10.1088/1361-665x/acf53d.

2 E. Efthymiou, Y. C. Pradeep, R. Nakka, *et al.*, "An interpretable deep learning approach to predict elastic-plastic properties of fiber composites," *(under review)*, Sep. 2023.

3 **Rajesh Nakka**, D. Harursampath, and S. A. Ponnusami, "A generalised deep learning-based surrogate model for homogenisation utilising material property encoding and physics-based bounds," *Scientific Reports*, vol. 13, no. 1, Jun. 2023. DOI: 10.1038/s41598-023-34823-3.

4 **Rajesh Nakka**, A. P. Kumar, D. Harursampath, and S. A. Ponnusami, "Influence of fibre cross-section profile on the multi-physical properties of uni-directional composites," *Composite Structures*, vol. 321, p. 117 321, Oct. 2023. DOI: 10.1016/j.compstruct.2023.117321.

5 **Rajesh Nakka**, D. Harursampath, M. Pathan, and S. A. Ponnusami, "A computationally efficient approach for generating RVEs of various inclusion/fibre shapes," *Composite Structures*, vol. 291, p. 115 560, Jul. 2022. DOI: 10.1016/j.compstruct.2022.115560.

References

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