

## PROFESSIONAL SUMMARY

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Researcher with over 6 years of international experience in mathematical modelling, numerical programming and analysis. Able to rapidly acquire new skills, evidenced by diverse research endeavours spanning from smart materials to applied machine learning. Industry exposure in technical roles and as a management consultant. Discovered a novel wave-scattering phenomenon during PhD.

## RESEARCH EXPERIENCE

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### University of Cambridge

*Postdoctoral Research Associate*

March 2023 - Present

*Cambridge, UK*

Research Areas: Machine Learning, Material Science.

- Developed an autoencoder-based approach for efficient latent representation of material science data.
- Created a genetic algorithm-based routine for generating balanced counts from a materials database.
- Implemented numerous deep-learning architectures and related training and regularization methods.
- Two research manuscripts under preparation. Gave a research talk at EPFL, Lausanne.

### University of Southampton

*Marie Skłodowska-Curie Fellow*

May 2019 - Dec 2022

*Southampton, UK*

Research Areas: Mathematical Modelling, Computational Mechanics.

- Numerical and theoretical analysis of ordinary & partial differential equations in the context of mechanics.
- Created a mathematical model for heat-exchanger dynamics, then converted to a user-friendly GUI tool.
- Developed a software pipeline for automated setup and scheduling of over 8000 FEA jobs on High-Performance Clusters, integrating BASH, Python, MATLAB, and ANSYS scripts.
- Discovered a new scattering phenomenon in waves travelling in random elastic media.

### New York University

*School of Engineering Fellow*

Aug 2017 - Oct 2018

*Brooklyn, USA*

Research Areas: Smart Materials

- Prototyped a macro-fiber composite-based haptic feedback navigation tool to aid the visually impaired.
- Demonstrated a method to enhance the actuation of ionic polymer metal composites. Designed and fabricated the high-power electronics required to conduct experiments.

## INDUSTRIAL EXPERIENCE

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### Boston Consulting Group

*Associate*

Nov 2018 - May 2019

*New Delhi, India*

- Worked on a profit turn-around project for a large steel manufacturer (>1.5 Bn GBP revenue).
- Identified process bottlenecks in 6 production plants from time-motion studies, interviews and data analysis.
- Synthesized findings and made recommendations to C-level executives.
- Wrote a Python script to automate data extraction, cleaning and visualization of defect reports in a production facility. This led to the identification of the root causes of >80 % of the defects.

## EDUCATION

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### University of Southampton

*Doctor of Philosophy*, Computational Engineering and Design Group  
*Marie Skłodowska-Curie Fellow*

Jun 2019 - Jun 2023

*Southampton, UK*

### Indian Institute of Technology Kanpur

*BT-MT Dual Degree*, Department of Mechanical Engineering  
Minor in Control Systems Engineering

Jul 2012 - Aug 2017

*Kanpur, India*

## PROGRAMMING/COMPUTING SKILLS

Python (PyTorch, Numpy, Pandas, Tkinter, sklearn), MATLAB, Mathematica, HPCs

## RELEVANT COURSES

**Math** Advanced Partial Differential Equations, Stochastic Calculus  
**Computing** Applied Numerical Methods, Biostatistics, Optimization Methods

## SECONDMENTS/INTERNSHIPS

<b>Vestas aircoil</b> <i>Visiting PhD Student</i>	Jan 2020 - Sep 2021 <i>Lem, Denmark</i>
<b>Singapore University of Technology and Design</b> <i>Summer Intern</i>	May 2016 - Jul 2016 <i>Upper Changi, Singapore</i>
<b>Whirlpool Global Technology &amp; Engineering Center</b> <i>Summer Intern</i>	May 2015 - Jul 2015 <i>Pune, India</i>

## AWARDS, FELLOWSHIPS & SCHOLASTIC ACHIEVEMENTS

<b>Marie Skłodowska-Curie Fellow</b> , University of Southampton	2019
<b>Best PhD Qualifying Exam</b> , NYU Tandon School of Engineering	2018
<b>School of Engineering Fellowship</b> , NYU Tandon School of Engineering	2017
<b>Best Intern Award</b> , Whirlpool Global Technology & Engineering Center	2015
<b>Merit-cum-Means Scholarship</b> , Indian Institute of Technology Kanpur	2014
<b>IIT-Joint Entrance Exam All India Rank 792</b> out of ~0.47 million candidates (99.8 %ile)	2012
<b>KVPY Fellowship</b> , National fellowship for students interested in research careers (Declined)	2012

## PEER-REVIEWED PUBLICATIONS

★ <i>PLoS ONE</i>	Branched flows of flexural elastic waves in non-uniform cylindrical shells.	2023
★ <i>Nature Commun. Phys.</i>	Branching flows of flexural waves in non-uniform elastic plates.	2022
† <i>Ex. Mech. Lett.</i>	How far does a fold go?	2021
★ <i>J. Acoust. Soc. Am.</i>	Acoustics of idakkā: An Indian snare drum with definite pitch.	2018
‡ <i>Appl. Phys. Lett.</i>	Enhancing the deformation range of ionic polymer metal composites through electrostatic actuation.	2018

★: As first author; ‡: As co-first author; †: As second author.

## SELECTED RESEARCH TALKS

<i>EPFL</i>	Open Databases Integration for Materials Design	2023
<i>Univ. College London</i>	Elasticity Day	2022
<i>Univ. of Oxford</i>	18th European Mechanics of Materials Conference	2022
<i>Univ. of Southampton</i>	ISVR Research Seminar	2022
<i>NUI Galway</i>	11th European Solid Mechanics Conference	2022
§ <i>Univ. of Cambridge</i>	Elasticity Day	2021

§: Delivered online.

## MISCELLANEOUS

- Organizer of the [InDEStruct Workshop](#) (~70 attendees.)
- Reviewer for [The European Physical Journal Plus](#) (Springer)