

Arghya Mondal | MS Scholar

Indian Institute of Technology Madras

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Education

Program	Institution/Board	%/CGPA	Year
<i>M.S.</i> (Aerospace Engineering)	Indian Institute of Technology Madras Chennai, Tamil Nadu	9.53/10	2021-Present
<i>B.Tech.</i> (Mechanical Engineering)	Kalyani Government Engineering College Kalyani, West Bengal	8.94/10	2016-2020
<i>Higher Secondary Education</i> (Science)	Burdwan Town School (WBCHSE Board) Burdwan, West Bengal	88.2%	2014-2016
<i>Secondary Education</i>	Uchalan High School (WBBSE Board) Bardhaman, West Bengal	90.71%	2014

Key Projects

- Wave propagation in metamaterial beam with passive vibration absorber*
(MS Thesis / Guide: Dr. Senthil Murugan) Aug 2021 - Present
IIT Madras
 - Currently working on **Experimental Vibration** of the metamaterial beam (with indented **Acoustic Black Hole & Local Resonator**) by **Frequency Response Function (FRF)** studies.
 - Computed numerically the effect of **Multistable Nonlinear Resonator** or simultaneous effect of the acoustic black hole & local resonator in metamaterial beam for low-frequency vibration attenuation.
 - Designed a locally resonant metamaterial for **Coupled Flexural and Torsional** vibration attenuation using **COMSOL Multiphysics** finite element simulations.
 - Keywords: Finite element method, Nonlinear Vibration, Spectral Element Method, COMSOL Multiphysics, MATLAB, Experimental Vibration, Frequency Response Function.
- Estimation of along wind response of tall buildings*
(B.Tech Project / Guide: Dr. Debojyoti Mitra) Sep 2019 - April 2020
Kalyani Government Engineering College
 - Estimated numerically the **Maximum Height** of a tall building at different areas (**Town, Open Terrain & Coastal Areas**) taking into account the human comfort by considering the along-wind response.

PG Course Work

- Key Courses** August 2021-December 2022
(Core and elective) IIT Madras
 - Basic Concepts in Aerospace Engineering
 - Control of Automotive System
 - Aerospace Structures
 - Energy Method for Structural Analysis
 - Finite Element Analysis
 - Lattice Structures

Course Projects

- Design of Controller for an Electro-Pneumatic Brake System*
(Control of Automotive system / Faculty: Dr. Srikanthan Sridharan) Sep-Nov 2022
IIT Madras
 - Designed a controller using **Pade's Approximation** and **Smith Predictor** method for the pneumatic subsystem of the heavy vehicle brake system.
- Heading angle control of autonomous ground vehicle system*
(Control of Automotive system / Faculty: Dr. Srikanthan Sridharan) Sep-Nov 2022
IIT Madras
 - Considered **Bicycle Vehicle** model to design a heading angle controller for an **Autonomous Ground Vehicle** taking into account the effect of **Steering Actuator Dynamics**.
- Suspension Control by Quarter Car and Half Car Modelling*
(Control of Automotive system / Faculty: Dr. Srikanthan Sridharan) Sep-Nov 2022
IIT Madras
 - Considered **Quarter Car & Half Car** modelling to design active & passive suspension controller and to develop a **Linear Quadratic Regulator (LQR)** for this suspension.

4. [Numerical Modelling of 2D Phononic bandgaps in elastic metamaterials](#) Feb-April 2022
(Lattice Structure / Faculty: Dr. Phanisri Pradeep Pratapa) IIT Madras
- Computed numerically elastic **Wave Propagation** of a phononic composite structure for low-frequency wave attenuation using **COMSOL Multiphysics** finite element simulations.

Skills

- Programming Language: Matlab, C Programming, Python, Mathematica
- Software: COMSOL Multiphysics, Microsoft Office, LaTeX, Simulink, Labview
- Subject: Metamaterial dynamics, Nonlinear vibration, Dynamical systems, Acoustic and noise control

Publications

- A. Mondal, S. Dutta and S. Murugan, Coupled flexural and torsional vibration attenuation with locally resonant metamaterials, **Materials Today: Proceedings** <https://doi.org/10.1016/j.matpr.2023.01.111> (Jan 2023)
- A. Mondal and S. Murugan, Flexural wave propagation characteristics of metabeam with simultaneous acoustic black hole and local resonator, **European Journal of Mechanics - A/Solids**, [Under Review](#) (Present)

Conferences

1. [13th International Symposium on Plasticity and Impact Mechanics 2022](#) August 2022
Indian Institute of Technology Madras
 - Participated and presented a paper on Coupled Flexural and Torsional Vibration Attenuation with Locally Resonant Metamaterials.
2. [18th International Conference on Vibration Engineering & Technology Of Machinery](#) Upcoming(Dec 2023)
Indian Institute of Technology Roorkee
 - Will present a paper on Attenuation Bandwidth Enhancement in Meta-structures with Nonlinear Multistable Local Resonator.

Industrial Training

1. [Bhandari Automobiles Private Limited](#) June 2019
(B.Tech / Mentor: Mr. Abhijeet Chatterjee) *Sodepur, Kolkata*
 - Completed two weeks training program on various types of vehicle inspection (safety & precaution, Pre-delivery inspection, road test etc.) of **TATA MOTORS**.
2. [Andrew Yule & Company Limited \(A Central Govt. Enterprise\)](#) January 2019
(B.Tech / Mentor: Mr. Subrata Kr. Roy) *Kalyani, West Bengal*
 - Completed two weeks training at different operational areas (Design & Drawing, Quality Assurance, Planning, Maintenance, Stores and Production) of production activities for manufacturing **Industrial Centrifugal Fans**.

Online Courses

- Nptel: [Refrigeration & Air-Conditioning \(IIT ROORKEE\)](#) with a consolidated score of 79% - ELITE (Sep 2018)
- Internshala: [Basic C & C++ Programming](#) (Dec 2018)
- MathWorks: [Matlab Onramp](#) (Dec 2021)

Position of Responsibility

- Managed and coordinated multiple programs of [Diganto](#), a Bengali association of IIT Madras. (2022- Present)
- Solved various problems of Mechanical Engineering at [Chegg](#) as *Managed Network Expert*. (April 2021- Nov 2022)

Achievements/Awards

- Recipient of [Half-Time Research Assistant \(HTRA\)](#) (2021-2023) by the MHRD, Government of India.
- Successfully qualified [ALL INDIA GATE](#) (2021) in Mechanical Engineering with 97.17 percentile.
- Secured 98 percentile in [West Bengal Joint Entrance Examination \(WBJEE\)](#) (2016).
- Selected as Indian Oil Scholar against [Indian Oil Educational Scholarship Scheme](#) (2014) for 10+ Course.
- Selected as a Scholar against [Nations Means cum Merit Scholarship](#)(2011).