Arghya Mondal

MS Research Scholar, IIT MADRAS

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I am currently an MS student and Research Scholar of IIT Madras.I am working on Vibration Minimization of beam-like structure using passive Metamaterials under Prof. Senthil Murugan.

Education

2021–2023 **Indian Institute of Technology MADRAS**, *MS*, Aerospace Engineering, *GPA:9.52/10*
Aero-Electro-Mechanics & System Lab
Advisor : Prof. Senthil Murugan

2016–2020 **Kalyani Government Engineering College, West Bengal**, *B.Tech*, Mechanical Engineering,
GPA : 8.94/10 (6th position in Department)

2014–2016 **Burdwan Town School**, *Higher Secondary Education*, *Under WBCHSE Board*
Score : 88.2% (Within top 2 percentile in board)

2014 **Uchalan High School**, *Secondary Education*, *Under WBBSE Board*
Score : 90.8% (Topper in School)

Research & Project

2021–present **Research Scholar**, *IIT MADRAS*, *Topic: Mechanical Metamaterial and Structures*
- Currently working on Vibration minimization through the structural beam using structural periodic unit lattice or passive metamaterials.
- Working on active vibration control using periodic piezoelectric patches on beam.
- Worked on a Local Resonant Metamaterial beam for controlling high frequencies flexural-torsional coupled vibration suppression.

Aug-Nov 2022 **Course Project**, *IIT Madras*, *Supervisor: Dr. Srikanthan Sridharan*
- Worked on Design of Controller for a Electro-Pneumatic Brake System.
- Worked on heading angle control of autonomous ground vehicle system.
- Worked on Suspension Control by Quarter Car and Half Car Modelling.

April 2022 **Course Project**, *IIT Madras*, *Supervisor: Dr. Phanisri Pradeep Pratapa*
- Worked on Numerical Modelling of Two-Dimensional Phononic Band Gaps in Elastic Metamaterials with Square Inclusions

2019–2020 **Undergraduate Project**, *Kalyani Government Engineering College*, *Supervisor: Dr. Debojyoti Mitra*
- Worked on estimation of maximum height of a tall building at different areas for human comfortable zone by considering along-wind response.

Publications

January 2023 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

Present S. Dutta, A. Mondal and S. Murugan, Coupled Flexural & Torsional Vibration Attenuation with Acoustic Black Hole and Beam-Mass Resonator Metamaterial (in preparation)

Present A. Mondal and S. Murugan, Flexural wave propagation in acoustic black hole indented metabeam with local resonator (in preparation)

Summer Training & Courses

June 2019 **Bhandari Automobiles Private Limited, Sodepur**,
- A two weeks program for Automobile Engineering (Worked on various type of vehicles Inspection of TATA MOTORS)

January 2019 **Andrew Yule & Company Limited, Kalyani**, *(A Central Govt. Enterprise)*
- A two weeks program for Fan Engineering (Worked on Design & Drawing, Quality Assurance, Planning, Maintenance, Stores and Production of Centrifugal Fan)

December 2018 **Internshala Basic C & C++ Programming**,
- A six weeks Winter Training on programming on Introduction to C and Basic C++ Programming Language from INTERNSHALA.

July 2018 **Internshala AutoCad Online Course**,
- A six weeks summer training on Computer Aided Drafting using AUTOCAD software from INTERNSHALA

September 2018 **NPTEL Refrigeration & Air-Conditioning**,
- A eight week online certification program on Refrigeration & Air Conditioning (NPTEL ONLINE CERTIFICATION)(with a consolidated score of 79% - ELITE) (CERTIFIED FROM IIT ROORKEE)

Graduate Courses

Finite Element Analysis, Energy Method for Structural Analysis, Lattice Structures, Aerospace Structures, Control of Automotive system

Computer Skills

Programming: MATLAB, Python, C-Language, Mathematica

Software: COMSOL Multiphysics, ANSYS, AutoCAD, Microsoft Word, Excel, PowerPoint, LaTeX, Simulink, Labview

Conferences

August 2022 **IMPLAST 2022**, *IIT MADRAS*,
- Presented a paper on Coupled Flexural and Torsional Vibration Attenuation with LR Metamaterials.

Awards

2021 Secured 98 percentile(approx.) in ALL INDIA GATE Examination (Mechanical Engineering Paper).

2016 Secured 98 percentile score in West Bengal Joint Entrance Examination (WBJEE).

2014 Selected as Indian Oil Scholar against Indian Oil Educational Scholarship Scheme-2014 for 10+ Course.

2011 Got National Merit Cum Means Scholarship-2011

Future Research Interests

Broadly: Computational Engineering & Science, Interdisciplinary Numerical modelling & Simulations, Vibration & Wave Mechanics, Control of Autonomous system

Specifically: Mechanical Metamaterials, Lattice Structure, Finite Element Method, Vibration Control, Optimization, Structural Mechanics, Bio-inspired Design.

References

Dr. Senthil Murugan

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Prof. Santanu das

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