Nidheesh V

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Academic Research Experience

Department of Mechanical Engineering, IIT Bombay

Mumbai, INDIA

Research Scholar (Materials Research Laboratory) *July 2022 - present*

- **Lattice dynamics and thermal energy transport:** Studied phonon-mediated thermal energy transport in nuclear fuel materials using density functional theory and lattice dynamics based first-priciple calculations . Tools used - QuantumESPRESSO, In-house ALD packages, Python.

Graduate School of Information Sciences, Tohoku University

Sendai, JAPAN

Research Scholar (Acoustic Information Systems Laboratory) *January 2021 - March 2022*

- **Spatial audio recording and reproduction:** Studied and implemented the spatial audio recording and binaural reproduction techniques which uses a rigid spherical microphone array for recording the sound space and far-field HRTFs for reproduction. Tools used - MATLAB.
- **Near-field binaural audio synthesis systems:** Worked on the synthesis of dense near-field HRTF datasets from known far-field HRTFs, to improve the accuracy of near-field virtual auditory displays. Tools used - MATLAB.

Professional Experience

Mercedes Benz Research & Development India Pvt. Ltd.

Bangalore, INDIA

CAE Analyst (NVH and Acoustics) *July 2017 - November 2020*

- **Analysing the effect of enclosures on loudspeaker performance:** Modeled the loudspeakers and enclosures, and studied the effect of enclosure volume, enclosure resonances, and acoustic short-circuits on the loudspeaker performance, using FEM simulations. Tools used - ANSA, COMSOL.
- **Evaluating the performance of automotive audio-system:** Modelled all the loudspeakers, enclosures, and passenger cabins, and simulated the system performance using FEM and RT simulations. Tools used - ANSA, COMSOL, CATTAcoustics, MATLAB.
- **CAE-Measurement correlations for audio-system:** Carried out correlation works to compare the CAE simulation results with in-car measurement results for the automotive audio system.
- **Virtual tuning and auralization of automotive audio-system:** Worked on auralization of the simulated audio-system and identification of the best tuning parameters for improving the performance of the system. Tools used - VR Tool, MATLAB.
- Carried out acoustic simulations to evaluate the performance of new loudspeaker technologies and conceptual audio-system designs.
- **SPL evaluation of automotive horns:** Worked on predicting the SPL of horns in the car assembly system using INA and BEM methods, and design suggestions are given to meet regulations. Tools used - ANSA, LMS VirtualLab, Simcenter3D

Education

Indian Institute of Technology, Bombay

Mumbai, INDIA

Ph.D. in Mechanical Engineering (ongoing), CGPA (until now): 9.55/10 *July 2022 - Present*

- **Specialization:** Thermal and Fluids Engineering
- **Research Area:** Understanding thermal energy transport in nuclear fuel materials using ab-initio calculations.
- **Key Courses:** Advanced Heat Transfer, Lattice Dynamics and Thermal Energy Transport, Molecular Simulations for Materials Engineering, Micro and Nanoscale Energy Transport, Materials modelling using atomistic first-principles calculations, High-performance Scientific Computing.

Indian Institute of Technology, Hyderabad

Hyderabad, INDIA

Master of Technology in Mechanical Engineering, CGPA: 9.30/10 *July 2015 - August 2017*

- **Specialization:** Mechanics and Design
- **Thesis:** 'Effect of joint distortions on breakout noise from a flexible rectangular duct'. Conducted experimental analysis to estimate the breakout noise from flexible duct walls. Carried out numerical simulations (FEM and BEM) to estimate breakout noise from ducts, and to correlate the findings from experiments. Analyzed the effect of joints on the breakout noise from ducts and developed analytical methodology to incorporate this effect. Used the INA technique to reconstruct the vibration velocities on flexible duct surfaces. Tools used - LMS VirtualLab, MATLAB.
- **Key Courses:** Dynamics and Vibration, Engineering Noise Control, Advanced FEM, Advanced topics in Mathematical tools

MA College of Engineering, Kerala

Kerala, INDIA

Bachelor of Technology in Mechanical Engineering, CGPA: 7.95/10 *July 2010 - August 2014*

- **Affiliation:** Mahatma Gandhi University, Kerala

Selected Publications

Journals

- **Virakante, N.**, & Jain, A. (2025). Revisiting thermal transport in ThO2 using higher-order thermal transport physics. Computational Materials Science, 254, 113882.
- Jade, N., **Nidheesh, V.**, & Venkatesham, B. (2019). Influence of Duct Joint on Modal Parameters of Rectangular Duct. Journal of Vibration Testing and System Dynamics, 3(1), 25-37.

Conferences

- **Virakante, N.**, & Jain, A. (2024). Considerations for ab-initio based thermal conductivity prediction of ThO2. In Proceedings of the 27th National and 5th International ISHMT-ASTFE Heat and Mass Transfer Conference December 14-17, 2023, IIT Patna, Patna-801106, Bihar, India. Begel House Inc..