

Aditi Kumawat

N1155, Arcisstrasse 21 – Munich 80333, Germany

Professional Experience

Technical University of Munich

Munich, Germany

Postdoctoral Researcher

2021–2023

- **Analysis of induced geothermal events in Germany**
 - Performed structural analysis of buildings near geothermal sites using ANSYS
 - Data-driven model updating of the frequency response functions of the building model
- **Surrogate modelling for building taxonomy**
 - Generated scenario-based artificial ground motions using a stochastic simulator
 - Implemented stochastic polynomial chaos expansion for building models
- **Synthetic ground motion generation for geothermally induced seismicity**
 - Developed a physics-based ground motion model for source-wavefield simulation

Technical University of Munich

Munich, Germany

Guest Scientist

2020–2021

- **Building response under induced seismicity**
 - Modeled structural behavior under ground vibrations using analytical approach
 - Validated the results using experimental data

University of Stuttgart

Stuttgart, Germany

Guest Scientist

2019–2020

- **Simulation and modelling of railway track defects**
 - Proposed an iterative technique to evaluate time-dependent loads on track structure
 - Analyzed the impact of rail/track defects on track health using the proposed approach

Indian Institute of Technology Kanpur

Kanpur, India

PhD Candidate

2015–2021

- **Wave propagation characterization of track behaviour**
 - Proposed a method to assess the impact of soil waves on railway track behavior
 - Tested validity of two track models based on train velocity and subgrade parameters.
- **Computational model for ballasted rail-track systems**
 - Proposed a model incorporating all essential substructural track components
 - Validated the model using experimental data for track accelerations
- **Evaluation of Green's function for the railway track**
 - Formulated a wave-number based approach to obtain track's impulse response function

Education

Indian Institute of Technology Kanpur

Kanpur, India

PhD

2015–2021

- Thesis Topic: *Ballasted Railway Track Systems: A New Analytical Framework for Modelling and Simulation*

MBM Engineering College

Jodhpur, India

B.E. (Civil Engineering)

2009–2013

- Graduated with *First Class Honors*

Open Source

- [FreqTrack](#) 2024
○ Modelling framework for ballasted railway track system
- [TaxoSim](#) 2023
○ Ansys-MATLAB framework for developing and analyzing building taxonomy
- [WaveSim](#) 2023
○ Code for generating ground motion for given soil-profile

Teaching Experience

Technical University of Munich

Munich, Germany

Tutorial/Lecture Sessions

2020-2023

- Structure Dynamics
- Integral Transform Methods
- Soil Vibrations: Emission, Propagation, Immission, Abatement
- Modelling and Simulation in Structural Mechanics

Computer skills

	Level	Skill	Years	Comment
Language	■■■■■	Matlab	10	<i>Integral to all phases of my research work</i>
	■■■■■	Python	4	<i>Used for data analysis in multiple projects</i>
Application	■■■■■	ANSYS	5	<i>Used as FEM modelling tool for dynamic analysis of structures</i>
	■■■■■	Origin	2	<i>Used as data visualization tool</i>
	■■■■■	AutoCad	2	<i>Gained instructional experience as a tutor</i>

Spoken Languages

English: Advanced (C2)

German: Intermediate (B1)

Hindi: Advanced (Native)

French: Beginner (A1)

Awards

2023: Secured funding for a co-authored project proposal on data-driven model updating to enhance [seismic safety](#) of buildings

2018: 'Best Presenter Award' for the paper presented IGC-2018, India

2015-2020: Graduate Scholarship, Ministry of Human Resource Development, India

Selected Publications

- [1] **Kumawat, A.**, F. Taddei, W.T. Kao, and G. Müller. Impact of geothermal micro-seismic events on the serviceability and comfort of urban structures. *to be submitted*, September 2024.
- [2] **Kumawat, A.**, S. Keil, F. Taddei, and G. Müller. Generation of synthetic ground motions for geothermally induced earthquakes. In *18th World Conference on Earthquake Engineering (WCEE)*, 2024.
- [3] F. Taddei, S. Keil, **Kumawat, A.**, and G. Müller. Comparison between ground motion data and semi-empirical spectral ground motion prediction equations for geothermal-induced micro-earthquakes. In *18th World Conference on Earthquake Engineering (WCEE)*, 2024.
- [4] F. Taddei, S. Keil, A. Khansefid, **Kumawat, A.**, F. Schneider, J. Wassermann, and G. Müller. Development and use of semi-empirical spectral ground motion models for gpp-induced micro-earthquakes in southern germany. *Bulletin of Earthquake Engineering*, pages 1–48, 2024.
- [5] **Kumawat, A.**, F. Taddei, and G. Müller. An iterative approach for analyzing wheel-rail interaction. In *International Conference on Wave Mechanics and Vibrations*, pages 567–580. Springer International Publishing, 2022.
- [6] **Kumawat, A.**, F. Taddei, A. Csuka, R. Cudmani, and G. Müller. Response analysis of low-rise buildings under micro seismic events induced by geothermal operations. In *International Conference on Noise and Vibration Engineering (ISMA)*, 2022.
- [7] F. Taddei, **Kumawat, A.**, A. Csuka, R. Cudmani, and G. Müller. Input characterisation for low-amplitude seismicity induced by geothermal operations. In *International Conference on Noise and Vibration Engineering (ISMA)*, 2022.
- [8] A. Csuka, **Kumawat, A.**, F. Taddei, R. Cudmani, and G. Müller. Deep geothermal power plants: Soil-structure interaction under micro-seismic events. In *Geo-Congress 2022*. American Society of Civil Engineers, 2022.
- [9] **Kumawat, A.**, U. Martin, S. Bahamon, and S. Rapp. The influence of local irregularities on the vehicle-track interaction. In *Advances in Transportation Geotechnics IV*, Lecture Notes in Civil Engineering. Springer, 2021.
- [10] **Kumawat, A.**, P. Raychowdhury, and S. Chandra. Frequency-dependent analytical model for ballasted rail-track systems subjected to moving load. *International Journal of Geomechanics*, 2019.
- [11] **Kumawat, A.**, P. Raychowdhury, and S. Chandra. A wave number based approach for the evaluation of the green's function of a one-dimensional railway track model. *European Journal of Mechanics - A/Solids*, 2019.
- [12] **Kumawat, A.**, P. Raychowdhury, and S. Chandra. Investigation of the inertial characteristics of the railway track system. In *Geotechnical Characterization and Modelling*. Springer, 2018. Proceedings of Indian Geotechnical Conference.