

Exponent®
Engineering & Scientific Consulting

Bahadir Sarikaya, Ph.D.

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Professional Profile

Dr. Sarikaya's areas of expertise include vehicle and machine dynamics, vibration, acoustics and control of vehicle systems and rotating machinery. Dr. Sarikaya provides scientific and engineering consulting services in the areas of mechanical engineering and accident reconstruction. Dr. Sarikaya is experienced with the investigation and accident reconstruction analysis of motor vehicle accidents involving passenger automobiles, motorcycles, heavy trucks, off-road recreational vehicles, pedestrians, and bicyclists.

His experience in photogrammetry analysis using PhotoModeler and Agisoft Metashape, terrestrial Faro 3D laser scanning, Computer-Aided Design (CAD) with Rhinoceros 3D, Solidworks and Siemens NX, vehicle handling and collision simulation with HVE, pre- and post-crash vehicle inspections including automobile Event Data Recorder data imaging, and site inspections enhance his consulting capabilities in the reconstruction of on-road and off-road motor vehicle accidents. As part of his educational and professional background, he has conducted analytical, computational and experimental analysis of conventional and electric vehicles with automotive companies. He is also proficient in Finite Element Analysis (FEA), digital signal processing, vehicle dynamics and Noise, Vibration and Harshness (NVH).Prior to joining Exponent, he was a research assistant at the University of Massachusetts Lowell's Structural Dynamics and Acoustics System Lab. During his studies, he worked on projects related to noise and vibration mitigation in transmissions for conventional and electric vehicles. He built dynamic models and conducted analytical, computational and experimental analyses to explore the impact of imperfections on the performance of various noise and vibration absorption mechanisms. His Ph.D. dissertation at the University of Massachusetts Lowell is titled, "The Impact of Manufacturing Imperfections on the Dynamic Response Characteristics of Centrifugal Pendulum Vibration Absorber (CPVA)". Dr. Sarikaya's dissertation work proposed new tuning strategies and diagnostic tools in the presence of imperfections for CPVAs using analytical and computational techniques.

Before his Ph.D. studies, he worked as a mechanical design engineer for two years at ASELSAN Inc, Ankara, Turkey. In that capacity, he was involved in all phases of the product development lifecycle, including design, documentation, prototyping, testing and quality control for electric bus and hybrid truck projects.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, University of Massachusetts, Lowell, 2023

B.S., Mechanical Engineering, Bilkent University, Turkey, 2015

Young Professional Award at the Inter-Noise Conference 2021

American Gear Manufacturer Association Scholarship, 2018 & 2019

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Prior Experience

Research and Teaching Assistant (Structural Dynamics and Acoustics System Laboratory), Mechanical Engineering Department, University of Massachusetts Lowell, 2017-2022

Mechanical Design Engineer, Transportation and Energy Systems Division, ASELSAN Inc, Ankara, Turkey, 2015-2017

Mechanical Engineering Intern, Factory Development Department, Renault Group (OYAK-Renault), Bursa, Turkey, 2014

Mechanical Engineering Intern, Headlamp Assembly Department, Magnetti Marelli-MAKO, Bursa, Turkey, 2013

Professional Affiliations

Society of Automotive Engineers (SAE), Member

American Society of Mechanical Engineers (ASME), Member

Languages

Turkish

Publications

Sarikaya, B. and Inalpolat, M., “Impact of Periodic Path Imperfections on Dynamic Response of Centrifugal Pendulum Vibration Absorbers”, Special Topics in Structural Dynamics & Experimental Techniques, Volume 5: Proceedings of the 42nd IMAC, A Conference and Exposition on Structural Dynamics, 2024

Sarikaya, B., ”The Impact of Manufacturing Imperfections on the Dynamic Response Characteristics of Centrifugal Pendulum Vibration Absorbers”, University of Massachusetts Lowell PhD Thesis Dissertation, 2023

Sarikaya, B. and Inalpolat, M., Response Sensitivity of Centrifugal Pendulum Vibration Absorbers to Symmetry-Breaking Absorber Imperfections. Journal of Sound and Vibration, 2022, p.117037.

Sarikaya, B., Ozdemir, E.T., Inalpolat, M., Lee, H.K. and Kim, M.S., An analytical model for predicting noise radiated by switch reluctance electric motors. INTER-NOISE and NOISE-CON Congress and Conference Proceedings. 2021;(263): 4100-4110.

Ozdemir, E.T., Sarikaya, B., Inalpolat, M., Lee, H.K. and Kim, M.S., A multibody dynamic model for predicting operational load spectra of dual clutch transmissions. INTER-NOISE and NOISE-CON Congress and Conference Proceedings 2021; (263): 4132-4143).

Sarikaya, B., Inalpolat, M., Lee, H.K. and Kim, M.S., An Analytical Investigation of the Impact of Design Parameters on the Performance of Centrifugal Pendulum Vibration Absorbers. ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference Proceedings 2019; (59308): V010T11A022.

Presentations

Sarikaya, B., Burnham, B., and Inalpolat, M., “A Computational Investigation into Vibration Absorption

Performance of Centrifugal Pendulum Absorbers with Different Absorber Configurations," International Modal Analysis Conference (IMAC XXXIX), February 2021.

Additional Education & Training

Institute of Police Technology and Management (IPTM) Crash Data Retrieval (CDR) Technician Training, March 2025

Society of Automotive Engineers (SAE) Vehicle Crash Reconstruction: Principles and Technology Training, Detroit MI, September 2024

HVE Forum, Engineering Dynamics Company LLC, Berkeley, CA, March 2024

PhotoModeler For Collision Investigation, Eos Systems Inc. June 2023

Simpack Fundamentals and Railroad Applications, Ankara, Turkey, April, 2016

Geometrical Dimensioning and Tolerancing, Ankara, Turkey, January, 2016

Siemens NX - Fundamental CAD, Assembly, Drafting and Advanced CAD, Ankara, Turkey, 2015

Introduction to Ansys Workbench, Ankara, Turkey, June, 2015

Peer Reviews

SAE International Journal of Electrified Vehicles

Journal of Vibration and Control

ASME International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC), Boston 2023

Modeling Estimation and Control Conference (MECC), Chicago 2024