National Institute of Technology Rourkela

Defence Seminar

Seminar Title	: Biomechanical modelling and biodynamic response analysis of seated occupants under whole-body vibration
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Venue	: CAD LAB, ID (MS team link 73442vf)
Date and Time	: 05 Jul 2023 (11:00 am)
Abstract	: Since the dawn of the industrial age, workplace vibration has significantly impacted people's ability to work comfortably. In general, supporting surface vibration exposes drivers and passengers of vehicles and machines to whole-body vibration (WBV). In the past, some researchers used real people as test subjects to determine their biomechanical characteristics (mass, stiffness and damping) and predict their biodynamic responses (seat-to-head transmissibility (STHT), apparent mass (AM) and driving point mechanical impedance (DPMI)). Discomfort, musculoskeletal disorders, fatigue, structural alterations in the lumbar area, back pain, muscular pain, disc degeneration, and annoyance are typical risks that humans experience due to WBV. To get past these problems, researchers strive for an alternative to experimentation that can generate comparable results. The first step in achieving this would be to create a biomechanical model with a human-like structure and enforce enough complexity to replicate or depict real people. The segmental vibration transmissibility ratio, power absorbed, ride comfort analysis, and damage estimation is a few uses of biomechanical models. These valuable benefits inspired the author to create biomechanical models that accurately imitate the biodynamic responses of actual humans in a seated posture. The work done in this thesis primarily focuses on the development of biomechanical modelling, as well as the analysis and assessment of biodynamic responses of seated occupants. The new aspect of the constructed model is how closely it resembles the actual human being.