INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Thesis Title: Damage Sensitive Feature Extraction and Classification in the Structural Systems using Time Series Representation in Phase-Space Portrait

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Thesis Submitted to the Department/ Center	:	CIVIL
Date of completion of Thesis Viva-Voce Exam	:	31-12-2017
Key words for description of Thesis Work	:	STRUCTURAL HEALTH MONITORING, DAMAGE DETECTION, DAMAGE SENSITIVE FEATURES

SHORT ABSTRACT

Due to increase in urbanization of the world population, the utilization of urban infrastructure has been accelerated. Therefore, the development of resilient, intelligent, smart and sustainable infrastructure is essential to deal with the ever-increasing needs. Unceasing utilization of the structural services has always necessitated timely and effective maintenance systems. Past two decades are evident of numerous accidents and sudden failure of structures due to extreme loading, that could have been easily averted by detailed inspection and routine maintenance. The requirement for a capable maintenance system and asset management is the availability of robust health monitoring background. The decision-making for reinstating the utility and safe operation of the critical infrastructure is often doubtful in absence of availability of robust structural health monitoring (SHM) and damage assessment framework. Therefore, the development and implementation of health monitoring algorithms to monitor the health of different structural systems subjected to the extreme scenario is a key aspect of this thesis. The thesis deals with development and implementation of four different health monitoring algorithms that successfully identifies the occurrence and evolution of damage. To verify all the proposed approaches, various experimental studies were carried out on a three storey shear building and a two storey moment resisting frame.