CURRICULAM VITAE

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3. **Date of Birth:** 29th July, 1967

4. **Academic Records:**

B. E. (1989, Civil Engg.)	: B. E. College, Calcutta University
M. Tech (2001, Struct. Engg)	: Indian Institute of Technology Bombay
Ph. D (2011, Civil Engg.)	: Indian Institute of Technology, Kharagpur

5. **Broad Area of Research:** Pavement Engineering, Structural Engineering

6. **Academic/Professional Honors**
   - MHRD Fellowship during Doctoral Studies
   - Reviewer of ASCE Journal of Transportation Engineering, International Journal of Pavement Engineering

7. **Professional/ Employment Summary:**

July 2004 to Feb'2011	:Research Scholar, Indian Institute of Technology Kharagpur
Feb'1998 to Jun' 2001	:Research Associate, Indian Institute of Technology Bombay
April 1991 to Jan' 1998	:Senior Design Engineer, Apex Techno Consultants Pvt. Ltd., Kolkata
Aug' 1989 to Apr' 1991	:Assistant Engineer, D. Sinha and Associates, Kolkata

8. **Summary of Research Publications:**
   - International Journals: 04
   - Proc. of International Conferences: 03

9. **Research Experience:**
   (A) M. Tech Dissertation: Fiber Reinforced Polymer Composites in the Rehabilitation and Strengthening of Reinforced Concrete Columns

   Abstract: Application of Fiber Reinforced Polymer Composites (FRPC) in the rehabilitation and strengthening of deteriorating structural members as well as in new constructions was explored. Effective utilization of FRPC as a confining material was found to increase substantially the strength and ductility of concrete columns. The behavior of concrete columns having different cross sections with different levels of confinement and loading conditions was studied. A number of experiments were performed to observe these effects. Based on the experimental observations, an analytical model was developed for standard short circular column and also for non-circular columns. The theoretical model could predict the response of concrete columns confined by FRPC. A design method for confined concrete column was proposed which involved the determination of the amount of confinement required for a desired increase in strength.

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(B) Research Project Sponsored by ISRO (as Research Associate in IIT Bombay)**:** Role of Fiber Matrix Interface in Fracture Toughness of Brittle Matrix Components

Abstract: Ceramic materials have the property to withstand very high temperature without loosing their strength but are prone to catastrophic brittle failure due to their lack of toughness, particularly in the presence of flaws. By reinforcing these ceramic materials with different ceramic fibers fracture toughness can be increased and the material is termed as Ceramic Matrix Composite (CMC). The properties of CMC are dominated by Fiber-matrix interface. It is found that, a weak fiber-matrix interface is desirable to impart sufficient toughness, whereas a strong interface bonding leads to catastrophic brittle failure. An analytical study was performed for the determination of optimum property profiles for the interfaces for different fiber-matrix combinations. A Finite Element model for CMC was developed for conducting sensitivity studies on different samples and the results obtained were synthesized into an Artificial Neural Network model to obtain the desired properties of CMC.

(C) Ph. D Thesis: Numerical and Experimental Investigations of Jointed Concrete Pavement

Abstract: Cement concrete pavements are being constructed in many new road projects in India as they are considered to be economical especially for the highly trafficked segments of national highways. In the present work, a three-dimensional finite element model has been developed for the analysis of jointed concrete pavement. The FE modeling considers several aspects of analysis and design like slab-foundation interaction, interface behavior between concrete slab and foundation, load transfer at joints by dowel bar and aggregate interlocking mechanisms, effect of temperature variation, nonlinear deformational response of concrete etc. Push-off tests have been conducted in the laboratory on model concrete pavements with different interface conditions (smooth and rough) and on different types of foundations (base and subbase) to obtain the values of coefficient of friction, which is a parameter for modeling interface condition. The FE model has been validated with the experimental results available in the literature and also from the results of structural evaluation of in-service concrete pavements carried out in the present work using Falling Weight Deflectometer.

Using the validated FE model, some of the current design issues have been examined. The effect of different pavement and joint related parameters on the load transfer characteristics of a doweled joint has been evaluated. The group action of the dowel bar system was also examined and useful relationships have been developed for estimation of the relative load shared by the individual dowel bars. The effect of different interface conditions on critical stresses under individual or combined action of wheel load and temperature differential has been studied. A generalized expression has been proposed for estimating the critical (edge) stress in the slab subjected to the combined action of axle loading and positive temperature gradient. A fatigue performance model has been developed based on fracture mechanics principles for predicting crack propagation within the concrete slab under cyclic loading.

Date: February 17, 2011
Place: IIT Kharagpur, India Swati Maitra (Roy)