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The research was directed to initiate a study of large-scale hereditary/non-hereditary control and distributed systems under randomly varying structural perturbations. The areas of research, namely, (i) Error estimates between the stochastic and corresponding deterministic systems, (ii) Numerical methods, and (iii) Diagonalization and stability are investigated.

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FINAL REPORT:

The research was directed to initiate a study of large-scale hereditary/non-hereditary control and distributed computing systems under randomly varying structural perturbations.

Three principal areas of research, namely

- (1) Error estimation between the stochastic and corresponding deterministic systems.
- (ii) Numerical Methods in Random Differential Equations,
- (iii) Diagonalization and Stability of Singularly Perturbed Stochastic integro-differential equations are investigated.

The findings and reports under this study resulted in the following list of publications.

1. Title: Periodic Boundary Value Problems for Second Order Impulsive Integro Differential Equations of Volterra-Type
Authors: G. S. Ladde, S. Sathanathan, and M. V. Moorthy.
Journal: To appear in *Proceedings of the Dynamic Systems and Applications*.

2. **Title:** Numerical Treatment of Random Differential Equations
Authors: G. S. Ladde, S. Sathananthan, and R. Pirapakaran
Journal: To appear in the *Proceedings of the 11th Army Conference in Applied Mathematics and Computing.*
3. **Title:** Stability and Error Estimates of Stochastic Integro-Differential Equations.
Authors: G. S. Ladde and S. Sathananthan
Journal: To appear in the *Proceedings of the 11th Army Conference in Applied Mathematics and Computing.*
4. **Title:** Diagonalization and Stability of Two-Time Scale Singularly Perturbed Linear Integro-Differential System
Authors: G. S. Ladde, and S. Sathananthan
Journal: To appear in the *Proceedings of the 11th Army Conference in Applied Mathematics and Computing.*