


PREFACE

The work reported in the thesis has been carried out in the department of Electrical Engineering, Indian Institute of Technology, Delhi, during the period August 1977 to April 1981. I am grateful to my supervisors Prof. A.K. Mahalanabis and Prof. B.N. Jain for suggesting the problems and for providing effective guidance throughout the duration of the work.

The main motivation behind this work has been to investigate the possibility of simplifying the results on the problems of stability of interconnected systems which have appeared in the literature till 1978. After reviewing the various contributions reported in the published literature till early 1978, we have found it desirable to adopt the Liapunov function based aggregation-decomposition techniques in order to obtain our results. Following Siljak and others, we have studied the sufficient conditions for the Liapunov stability of linear, bilinear and nonlinear deterministic and stochastic interconnected systems. While the stability conditions given by these workers have a centralized form, we have shown that these conditions can be replaced by purely decentralized conditions which are easier to test.

Our emphasis all through the report is on the derivation of the decentralized stability conditions and their illustration for numerical examples. We have also discussed an application of the decentralized stability conditions to the problems of decentralized stabilization of the interconnected systems.

I shall like to take this opportunity to express my thanks to Mr. P.M. Padmanabhan Nambiar for the neat and accurate typing.


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DECENTRALIZED STABILITY ANALYSIS AND CONTROL OF
A CLASS OF LARGE SCALE SYSTEMS

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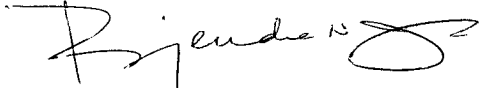
Thesis submitted to the
Indian Institute of Technology, Delhi
for the award of
DOCTOR OF PHILOSOPHY

Department of Electrical Engineering
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APRIL 1981

CERTIFICATE

This is to certify that the thesis entitled " Decentralized Stability Analysis and Control of a Class of Large Scale Systems" being submitted by Ramanand Singh for the award of Doctor of Philosophy to the Indian Institute of Technology, Delhi, is a record of bonafide research work he has done during August, 1977 to April, 1981 under our supervision. The results obtained in this thesis have not been submitted to any other University or Institute for award of any degree or diploma.



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