FINAL REPORT

NUMERICAL METHODS AND APPROXIMATION AND MODELLING

PROBLEMS IN STOCHASTIC CONTROL THEORY

Contract AFOSR-AP-76-3063

July 1, 1980 - June 30, 1981

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

Brown University
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August 20, 1981

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SUMMARY OF SCIENTIFIC PROGRESS, July 1980 - June 1981

Papers by H.J. Kushner

Diffusion approximations for non-linear phase-locked loop type systems with wide band inputs.

Stochastic approximations with discontinuous dynamics and state dependent noise, w.p.1 and weak convergence.

An averaging method for stochastic approximations with discontinuous dynamics.

A cautionary note on the use of singular perturbations.

Convergence and rate of convergence of a recursive identification and adaptive control method which uses truncated estimators.

Asymptotic distributions of solutions of ordinary differential equations with wide band noise inputs; approximate invariant measures.

The above papers deal with a wide variety of methods and examples in the modelling, analysis and approximation of systems with wide band noise inputs, recursive stochastic procedures and adaptive control problems.

Invited Lectures by H.J. Kushner

Conference on Stochastic Systems, September, 1980, Budapest;
IFID Conference on Recent Advances in Filtering and Optimization, Feb. 1982, Mexico;
Conference on Decision and Control, December 1981;
Joint Automatic Control Conference, August, 1980;

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MATTHEW J. KEPHER
Chief, Technical Information Division
Summary - continued

Papers by W.H. Fleming


Optimal control for partially observed diffusions, SIAM J. on Control and Optimization (1981).

Nonlinear semigroup for controlled partially observed diffusions, SIAM J. on Control and Optimization (1981).

Stochastic calculus of variations and mechanics, J. Optimization Theory and Applications (special issue dedicated to L. Cesari, 1982).


Invited Lectures by W. H. Fleming

Summer 1980, American Math. Society meeting;
IFIP Working Conference on Stochastic Differential Systems (Hungary), Sept. 1980;
Semester on Mathematical Theory of Optimal Control (Poland), Sept. 1980;
University of Oklahoma (Karcher Lecture), Nov. 1980;
INRIA International Conference on Analysis and Optimization of Systems (France) Dec. 1980;
University of Maryland (College Park and Baltimore Co.), March 1981;
Courant Institute of Math. Sciences, April 1981;
Bell Labs, Holmdel, April 1981;
Math. Research Center, Univ. of Wisconsin, April 1981;
IEEE Conf. on Decision and Control, Dec. 1981;
IFIP Working Conference on Recent Advances in Filtering and Optimization, Feb. 1982 (Fleming chairs the International Program Committee).
Numerical Methods of Approximation and Modelling Problems in Stochastic Control Theory.

Report prepared by:
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