数学与系统科学研究院学术报告

报告题目：Solvable Stochastic Control Problems

报 告 人：Tyrone E. Duncan (University of Kansas)

时间地点：6月2日下午4:00—5:00，N205

摘要：Various problems of stochastic optimal control and stochastic di\_eren-tial games are formulated and explicitly solved. The solutions do not re-quire solving Hamilton-Jacobi-Bellman partial di\_erential equations or solv-ing forward-backward stochastic di\_erential equations with a stochastic max-imum principle. An optimal control for a linear stochastic equation with aquadratic cost functional and a noise process that is square integrable withcontinuous sample paths is explicitly solved. The optimal control is the sum of the optimal control for a Brownian motion noise and a prediction of the response of the dual optimal system to the future noise The control of a linear stochastic system with a cost that is the exponential of a quadratic function in the systems state and the control and a Brownian motion noise is solved in an elementary way that provides an explanation for the di\_er-ence between the Riccati equations for the problems with quadratic costs and with the costs that are exponentials of quadratic functionals. Some control problems for nonlinear stochastic systems that evolve in rank one compact and noncompact symmetric spaces such as spheres and hyperbolic spaces are explicitly solved for a family of cost functionals. The control of some linear equations in an in\_nite dimensional Hilbert space with a quadratic cost and a fractional Brownian motion noise are explicitly solved. These linear equa-tions can describe stochastic partial di\_erential equations of both parabolic and hyperbolic type. Some control problems for discrete time linear equa- tions with quadratic cost functionals and arbitrary correlated noise processes are explicitly solved by a direct method. Two person stochastic di\_erential games that arise from the above problems are also solved explicitly. Some topics are joint work with B. Maslowski and B. Pasik-Duncan.

报告人简介：

NAME: Tyrone E. Duncan

BORN: July 16, 1941, New York, NY

EDUCATION:

1963 B.E.E., Rensselaer Polytechnic Institute

1964 M.S., (Electrical Engineering), Stanford University

1967 Ph.D., (Electrical Engineering), Stanford University

POSITIONS HELD:

1960-62 (Summers) Mathematician, Douglas Aircraft Company

1963 (Summer) Member of Technical Staff, Hughes Aircraft Company

1964 Consultant, RAND Corporation

1967-71 Assistant Professor, Department of Aerospace Engineering,

University of Michigan

1969-70 Visiting Assistant Professor, Department of Electrical Engineering and Computer Sciences, University of California, Berkeley

1971-74 Associate Professor, Department of Applied Mathematics and Statistics, State University of New York, Stony Brook

1972 Visiting Research Professor, Control Theory Centre, University of

Warwick, England (June-July)

1975 Lecturer, Centre de Recherche de Mathematiques de la Decision, Universite Paris IX Dauphine (January)

1974-78 Associate Professor, Department of Mathematics, University of Kansas

1978-79 Gastprofessor, Institut fur Angewandte Mathematik und Informatik, Universitat Bonn

1979 Courtesy Professor, Department of Electrical Engineering, University of Kansas

1979-80 Visiting Scholar and Research Fellow, Division of Applied Sciences, Harvard University

1979-Present Professor, Department of Mathematics, University of Kansas

HONORS:

1999 IEEE Fellow

1999 Olin K. Petefish Award in the Basic Sciences of the Higuchi/Endowment Research Achievement Awards (annual award to one researcher among the universities in Kansas)

2010 IFAC Fellow

2012 Max Wells Teaching Award, Mathematics Department, University of Kansas

2013 W. T. and Idalia Reid Prize from SIAM