

# Preface

This volume contains almost all of the papers that were presented at the Workshop on Stochastic Theory and Control that was held at the University of Kansas, 18–20 October 2001. This three-day event gathered a group of leading scholars in the field of stochastic theory and control to discuss leading-edge topics of stochastic control, which include risk sensitive control, adaptive control, mathematics of finance, estimation, identification, optimal control, nonlinear filtering, stochastic differential equations, stochastic partial differential equations, and stochastic theory and its applications. The workshop provided an opportunity for many stochastic control researchers to network and discuss cutting-edge technologies and applications, teaching and future directions of stochastic control. Furthermore, the workshop focused on promoting control theory, in particular stochastic control, and it promoted collaborative initiatives in stochastic theory and control and stochastic control education.

The lecture on “Adaptation of Real-Time Seizure Detection Algorithm” was videotaped by the PBS. Participants of the workshop have been involved in contributing to the documentary being filmed by PBS which highlights the extraordinary work on “Math, Medicine and the Mind: Discovering Treatments for Epilepsy” that examines the efforts of the multidisciplinary team on which several of the participants of the workshop have been working for many years to solve one of the world’s most dramatic neurological conditions.

Invited high school teachers of Math and Science were among the participants of this professional meeting. They were motivated and inspired by the First NSF Workshop for High School Teachers of Math and Science that took place in June of 2000 in Chicago. These teachers joined control researchers in their love and fascination for stochastic theory and control. The teachers at the meeting seemed to be really excited to be invited to such a specialized technical meeting. Furthermore, a number of graduate students were invited to broaden their exposure in stochastic control education.

On October 19, the workshop honored the sixtieth birthday of Tyrone Duncan, an important contributor to stochastic control theory. 110 people attended the reception to honor Tyrone Duncan. The reception was held at the University of Kansas Spencer Museum of Art. The Master of Ceremony was John Baillieul from Boston University, the Keynote Speakers were Sanjoy Mitter from Massachusetts Institute of Technology and Charles Himmelberg from University of Kansas. Music was provided by Cellist, Ed Laut, Professor of Music and Dance, from University of Kansas.

The workshop had three important aspects:

1. the outreach program—it was videotaped by PBS
2. the control education program—it brought several high school teachers together with control researchers and students

3. the interdisciplinary research programs—it brought together mathematicians, engineers, economists, and biomedical scientists together to discuss control systems applications.

The workshop was supported by the National Science Foundation and the University of Kansas. We especially thank Dr. R. S. Baheti, NSF Program Director and Jack R. Porter, Chairman of the Department of Mathematics, University of Kansas. We also thank Diana Carlin and Robert Weaver from the College of Liberal Arts and Sciences, George Bittlingmayer and Prakash Shenoy from the School of Business, Victor Frost from the Information and Telecommunication Technology Center, Robert Barnhill and Jim Roberts from the KU Center for Research for providing additional important funds and Cheryl Schrader, 2001 Vice President for Conferences, IEEE Control Systems Society, for providing important co-technical sponsorship.

We thank the members of the Program Committee: John Baillieul, Sergio Bittanti, Wendell Fleming, P. R. Kumar, Steven Marcus, William McEneaney, Sean Meyn, Lukasz Stettner, Pravin Varaiya, George Yin, Qing Zhang, and Xun Yu Zhou, and the members of the Organizing Committee and Local Advisory Board: Robert Barnhill, Mark Frei, Victor Frost, Ivan Osorio, Jack Porter, Prakash Shenoy, John Westman and Fred Van Vleck. Kerrie Brecheisen, Kathleen Brewer, Monica McKinney, Gloria Prothe, Sandra Reed, Yi Yan, and Yiannis Zacharious were the local assistants whom we thank for their generous help with the administration of the workshop. We also thank all reviewers for their important contributions to the quality of this volume. Larisa Martin did an outstanding job typesetting this manuscript. Last, but not least, we would like to thank all the participants for making this workshop successful and memorable. Very special thanks go to two participants, Lukas Stettner and Tyrone Duncan, for their outstanding assistance in preparing this volume during the last two months.

It has been my pleasure, honor, and joy to work with all the participants and the outstanding authors of this volume. I hope that the readers of this volume will enjoy reading it as much as I did. I would like to thank my husband and colleague, Tyrone, and my daughter, Dominique, for their help and support during my work on this project.

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