

AARMS Report

The 2006 APICS Mathematics/Statistics and Computer Science conference was held at Cape Breton University during the weekend of October 13-15, 2006. In conjunction with the APICS meeting AARMS sponsored two symposia in the mathematical sciences:

Mathematical Modelling and Simulation
Multivariate Statistical Analysis

Both events were held on Saturday October 14.

1. **Mathematical Modelling and Simulation Session**

Organizers: George Chen (Cape Breton University) and
Ronald Haynes (Acadia University)

Number of attendees: 22

This session began at 10:45am and ended at 5:30pm

List of Speakers

Chris Budd (Plenary Speaker), the University of Bath, UK

Topic: Mesh generation by using optimal transport methods

Arnold Mitnitski, Dalhousie University

Topic: An approach to modeling biological aging

Ronald Haynes, Acadia University

Topic: Moving mesh methods and domain decomposition

Richard Karsten, Acadia University

Topic: Dynamics of the Antarctic Circumpolar Current

Joshua Gould, Acadia University

Topic: Simulation and control of mite infestations in an apple orchard

Paul Muir, Saint Mary's University

Topic: Error Control Software for Partial Differential Equations in 1D

Rebecca White, Dalhousie University

Topic: The Generalized Minimal Residual (GMRES) Method

George Chen, Cape Breton University

Topic: A Simple Adaptive Mesh Generation and Its Applications

Significance:

This AARMS session provided a great venue for students and researchers in mathematical modelling and simulation to present their results. The presentations illustrated the diversity of research in these areas currently underway in Atlantic Canadian institutions and promise to promote future collaboration. The talks were all of top quality and the organizers were particularly impressed by the student talks given by Josh Gould (Acadia) and Rebecca White (Dalhousie). The attendees were also treated to a world—class research talk given by Dr. Chris Budd (Bath) who brought the audience to the forefront of results concerning mesh generation with respect to blowup problems.

2. **Multivariate Statistical Analysis Symposium**

Organizer: Edmund Rudiuk, Cape Breton University

This symposium was well attended; it included a plenary APICS Field Lecture by Dr. Keith Thompson on Coastal Flooding and Climate Change, as well as eight 30-minute contributed talks, some by graduate students. A number of participants from the APICS Conference attended a selection of the talks in this session.

Number of attendance: 20

This session began at 10:45am and ended at 5:15pm

List of Speakers

Keith Thompson (Plenary Speaker): Dalhousie University

Topic: Ocean eddies in forecasting ocean weather

Ying Zhang, Acadia University

Topic: Bias coefficient of the exact MLE of AR(1)

Hugh Chipman, Acadia University

Topic: Trees models in sequential design

Amir T. Payandeh, University of New Brunswick, Fredericton

Topic: Estimating a bounded location parameter under absolute-value loss

Melanie Abeysundera, Dalhousie University

Topic: Prediction of protein structure and function using spectral envelope

Liang Sun, Acadia University

Topic: Comparison of different estimation methods for AR(1) autocorrelation parameter.

Amanda Halladay, Dalhousie University

Topic: Parameter estimation in non-gaussian state-space models

Celia Huang, Acadia University

Topic: Non-linear and linear mixed effect models in analysis of environmental factors and Blanding's turtles' growth

Significance:

The purpose of the symposium was to bring together researchers in statistics in Multivariate Statistical Analysis. The symposium provided a forum to both review and facilitates identification of statistical methods and modeling approaches with the potential to address outstanding research questions.

The event was made possible through the generous support of AARMS, with additional support provided by the Department of Mathematics and Statistics and the Office of Research at Cape Breton University. This event brought together 20 researchers, postdoctoral fellows and students. The graduate students especially benefited from the opportunity to meet and interact with their peers across the region, as well as to hear the many and varied research interests of faculty. Excellent talks of invited speaker Keith Thompson of Dalhousie University presented the statistical techniques used in forecasting ocean eddies in relation to ocean properties such as temperature and biological productivity.

Many mathematics and statistics departments in Atlantic Canada have hired new faculty in statistics in the last few years. It thus provided an opportunity for these faculty and students to become acquainted and learn about some of the (new and ongoing) research in the statistical sciences in Atlantic Canada.

AARME Schedule

1. Mathematical Modeling and Simulation

Saturday, Oct. 14, Place CE 326

10:45 – 11:30	Plenary Speaker: Chris Budd, the University of Bath, UK Optimal transport methods for mesh generation
11:30 – 12:05	Arnold Mitnitski, Dalhousie University Mathematical modeling of aging as a process of accumulation of health deficits
12:05 – 2:00	Lunch
2:00 – 2:35	Ronald Haynes, Acadia University The Story of Two Schwarz Waveform Moving Mesh Methods
2:35 – 3:10	Richard Karsten, Acadia University Dynamics of the Antarctic Circumpolar Current
3:10 – 3:30	Joshua Gould, Acadia University Simulation and control of mite infestations in an apple orchard in the Annapolis Valley, Nova Scotia, Canada

3:30 – 3:45	Nutrition Break
3:45 – 4:20	Paul Muir, Saint Mary's University Error Control Software for Time-Dependent 1D Partial Differential Equations
4:20– 4:55	Rebecca White, Dalhousie University The Generalized Minimal Residual (GMRES) Method Applied to the Inverse Problem of Electrocardiography
4:55– 5:30	George Chen, Cape Breton University A Simple Adaptive Mesh Generation and Its Applications to Blow-up Solutions and Image Processing

2. Multivariate Statistical Analysis

Saturday, Oct. 14, Place CE 323

10:45 – 11:15	Ying Zhang, Acadia University Exact MLE of AR(1) and Unit Root Tests
11:15 – 12:05	Hugh Chipman, Acadia University Sequential Design for Drug Discovery
12:05 – 2:00	Lunch
2:00 – 2:40	Plenary Speaker: Dr. Keith Thompson, Dalhousie University Forecasting Ocean Weather
2:40 – 3:05	Amir T. Payandeh, University of New Brunswick, Fredericton Estimating a bounded location parameter under absolute-value loss
3:05 - 3:30	Melanie Abeysundera, Dalhousie University Prediction of protein structure and function using spectral techniques
3:30 - 3:45	Nutrition Break
3:45 – 4:15	Liang Sun, Acadia University A Comparison Study of Different Estimation Methods for the AR(1) Process
4:15 – 4:45	Amanda Halladay, Dalhousie University Parameter Estimation in Non-Gaussian State-Space Models using Particle Methods and the EM Algorithm
4:45 – 5:15	Celia Huang, Acadia University Analysis of the Blanding's Turtle and Climate Change