RELIABILITY AND QUALITY IN DESIGN

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AUGUST 5-7, 2004
LAS VEGAS, NEVADA, USA

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THURSDAY, AUGUST 5, 2004

8:00 am – 3:00 pm   *Registration*

8:45 am – 9:00 am   *Opening Remarks*

SESSION 1

Thursday, August 5, 9:00 am – 11:00 am

Special Lecture:

Uniform Experimental Designs and Their Applications

Speakers: **Kai-Tai Fang, Hong Kong Baptist University**
           Ling-Yau Chan, The University of Hong Kong

This lecture introduces a type of experimental design, called the uniform design (UD), which has been studied theoretically for several decades. Recently, Ford Motor Company has employed the UD as a standard practice for their computer experiments on engine development. Uniform designs are robust to the underlying response surface model, and can be used effectively in computer experiments. This lecture will explain the rationale of uniformity in design, introduce discrepancy measures and methods for construction of UD's, and give examples of applications of UD's in the industry and in reliability design. Further applications of the UD, experiments with mixtures, designs for accelerated stress testing are also discussed.

Kai-Tai Fang is a founder of uniform design. He is the Chair Professor and Head of Department of Mathematics at Hong Kong Baptist University. In the last two decades he has studied uniform designs intensively, and has applied them successfully in more than 500 industrial cases. He has published more than 170 papers and the authors of several books. He is an elected fellow of ASA, ISI, and IMS. Ling-Yau Chan is an Associate Professor and Head of Department of Industrial and Manufacturing Systems Engineering at The University of Hong Kong. He is a Fellow of the Royal Statistical Society.

11:00 am – 11:15 am   *Coffee Break*

SESSION 2

Thursday, August 5, 11:15 am – 12:30 pm

Reliability and Robust Design in Automotive Engineering

Chair: Everett Y. Kuo (Ford Motor Company, USA)

Reliability of Disc Brake Squeal Predictive Models

Yitzong Chern (Ford Motor Company, USA)
Rena H. Basch (Ford Motor Company, USA)
Dale L. Hartsock (Ford Motor Company, USA)

An Improved and Automated Finite Element Analysis for Fatigue Initiation Life Predictions of Notched Components

Ramanathan M. Ranganathan (Oakland University, USA)
Yung-Li Lee (DaimlerChrysler Corp., USA)
Randy J. Gu (Oakland University, USA)

On the Relation between High Mileage NVH Performance and Consumers' subjective Feeling of Vehicles on Solid and Durable Construction

Everett Y. Kuo (Ford Motor Company, USA)
Frank Chen (Ford Motor Company, USA)

SESSION 3

Thursday, August 5, 11:15 am – 12:30 pm

Software Reliability

Chair: Shigeru Yamada (Tottori University, Japan)

Architecture-Based Heterogeneous Software Reliability

Swapna S. Gokhale (University of Connecticut, USA)

Optimal Software Release Problem Based on the Number of Debuggings with Availability Requirement

Koichi Tokuno (Tottori University, Japan)
Shigeru Yamada (Tottori University, Japan)

Customer-Perceived Software Failure Rate Prediction Before Field Deployment

Xuemei Zhang (Lucent Technologies, USA)
Hoang Pham (Rutgers University, USA)

SESSION 4

Thursday, August 5, 1:30 pm – 3:00 pm

Reliability Methods and Its Applications

Chair: Guangbin Yang (Ford Company, USA)

The Chance Constraint Assignment Problem

Tetsuo Ichimori (Osaka Institute of Technology, Japan)
Asuka Yamakawa (Kobe International University, Japan)

Introduction of a Selection Parameter in Genetic Algorithm for a Constrained Reliability Problem

Laure Rigal (Ecole des Mines de Nantes & IRCCyN, France)
Bruno Castanier (Ecole des Mines de Nantes / IRCCyN, France)
Philippe Castagliola (Ecole des Mines de Nantes / IRCCyN, France)

Experimental Investigation on Electric Fans for Domestic Appliances: Product Development and Reliability Tests

M. Bevilacqua (Università di Bologna, Italy)
Filippo Emanuele Ciarapica (Universita' Politecnica delle Marche, Italy)
G. Giacchetta (Universita' Politecnica delle Marche, Italy)

The Use of Monte Carlo Simulation in the Development of a Step-Stress Test Profile

John Donovan (Institute of Technology Sligo, Ireland)
Valter Loll (Nokia Mobile Phones, Denmark)
Jeff Punch (University of Limerick, Ireland)

SESSION 5

Thursday, August 5, 1:30 pm – 3:00 pm

Quality Planning and Measurements

Chair: Yi-Kuei Lin (Vanung University, Taiwan)

Design Process Error-Proofing: Challenges and Methods in Quantifying Design Elements

Lawrence P. Chao (Stanford University, USA)
Kosuke Ishii (Stanford University, USA)

External Operating Environment and Managerial Efficiency of International Tourist Hotels in Taiwan: Application of Four–Stage DEA Procedure

Fei-Ching Wang (Jin-Wen Institute of Technology, Taiwan)
Wei-Ting Hung (Vanung University, Taiwan)
Jui-Kou Shang (Jin-Wen Institute of Technology, Taiwan)

Productivity and Quality Changes in Taiwan International Tourist Hotels: A Malmquist Index and Bootstrap Approach

Wei-Ting Hung (Vanung University, Taiwan)
Fei-Ching Wang (Jin-Wen Institute of Technology, Taiwan)
Jui-Kou Shang (Jin-Wen Institute of Technology, Taiwan)

Evaluate the System Performance of an E-Commerce Network with Failure Nodes

Yi-Kuei Lin (Vanung University, Taiwan)

3:00 pm – 3:15 pm   Coffee Break

SESSION 6

Thursday, August 5, 3:15 pm – 5:00 pm

Automotive Reliability Challenges

Chair: Julius Wang (Mbtech - North America, USA)

Lead-Free Soldering for Automotive Application - A Challenge to Meet the Reliability Requirement

Viktor Tiederle (RMCtech, Germany)
Joerg Mahrle (RMCtech, Germany)

Virtual Qualification: a New Reliability Paradigm

Anoop Rawat (Mbtech Group North America, USA)
Julius Wang (Mbtech Group North America, USA)

Optical MOST Devices for Automotive Applications - Qualification Procedure and Experiences

Viktor Tiederle (RMCtech, Germany)
Joerg Angstenberger (RMCtech, Germany)

A Method for Correlating Accelerated life Testing to Field Life for Electronics Modules

David W. Coit (Rutgers University, USA)
John L. Evans (Auburn University, USA)
Nathan Vogt (Auburn University, USA)
James R. Thompson (DaimlerChrysler Huntsville Electronics, USA)

Reliability Engineering in Electronic Systems - Innovative Methods for the Automotive Industry

Martin Heine (RMCtech, Germany)

SESSION 7

Thursday, August 5, 3:15 pm – 5:00 pm

Optimal Maintenance Modeling

Chair: Toshio Nakagawa (Aichi Institute of Technology, Japan)

Optimal Random Replacement Policies

Toshitsugu Sugiura (Aichi Institute of Technology, Japan)
Satoshi Mizutani (Aichi Institute of Technology, Japan)
Toshio Nakagawa (Aichi Institute of Technology, Japan)

A Survey of Finite Inspections Models

Satoshi Mizutani (Aichi Institute of Technology, Japan)
Kazuyuki Teramoto (Aichi Institute of Technology, Japan)
Toshio Nakagawa (Aichi Institute of Technology, Japan)

Optimal Maintenance Policies for a System with Given Damage Level

Toshio Nakagawa (Aichi Institute of Technology, Japan)
Kodo Ito (Mitsubishi Heavy Industries, LTD., Japan)

Bivariate Failure Interaction Models and Its Age Replacement Policy

Takashi Satow (Tottori University, Japan)
Qing Zhao (Tottori University, Japan)
Hajime Kawai (Tottori University, Japan)

An Inspection-Maintenance Model for Repairable Systems with Multiple Competing Processes

Wenjian Li (Rutgers University, USA)
Hoang Pham (Rutgers University, USA)

5:30 pm – 7:00 pm   Reception

FRIDAY, AUGUST 6, 2004

SESSION 8

Friday, August 6, 8:30 am – 10:00 am

Applied Reliability Modeling

Chair: Shouji Nakamura (Kinjo Gakuin University, Japan)

Optimal Scheme of Window-Flow Control for a Communication System with Congestion

Mitsutaka Kimura (Gifu city Women's College, Japan)
Mitsuhiro Imaizumi (Aichi Institute of Technology, Japan)
Kazumi Yasui (Aichi Institute of Technology, Japan)

Optimal Checkpointing Number for Multiple Recovery Schemes
Kenichiro Naruse (Aichi Institute of Technology, Japan)
Sayori Nakagawa (Kinjo Gakuin University, Japan)
Shigeru Yamada (Tottori University, Japan)

Optimal Database Construction Interval for Certificate Revocation List in PKI
Syouji Nakamura (Kinjo Gakuin University, Japan)
Miwako Arafuka (Kinjo Gakuin University, Japan)
Toshio Nakagawa (Aichi Institute of Technology, Japan)

AGES: Automatic Generation of EFSMs from SDL Specifications
Eric Wong (University of Texas at Dallas, USA)
Xiao Ma (University of Texas at Dallas, USA)
Dan Zhuo (University of Texas at Dallas, USA)
Kendra Cooper (University of Texas at Dallas, USA)

SESSION 9

Friday, August 6, 8:30 am – 10:00 am

Probabilistic Modeling & Forecasting Methods
Chair: D. Gary Harlow (Lehigh University, USA)

System Availability
Ming-Wei Lu (DaimlerChrysler Corporation, USA)
Richard J. Rudy (DaimlerChrysler Corporation, USA)
William D. Carlson (DaimlerChrysler Corporation, USA)

Forecasting Methods for Lumpy Demand of Aircraft Spare Parts
Alberto Regattieri (Bologna University, Italy)
M. Gamberi (University of Padova, Italy)
R. Manzini (University of Padova, Italy)
Alessandro Persona (University of Padova, Italy)

A Binomial-Weibull Model for Forecasting L.T.I. (Low Turnaround Index) Parts Needs
Arrigo Pareschi (Bologna University, Italy)
Alessandro Persona (University of Padova, Italy)
Alberto Regattieri (Bologna University, Italy)
Marco Catena (University of Padova, Italy)

Error Management
D. Gary Harlow (Lehigh University, USA)

10:00 am – 10:15 am   Coffee Break

SESSION 10

Friday, August 6, 10:15 am – 11:45 am

Security and Reliability
Chair: Taghi M. Khoshgoftaar (Florida Atlantic University, USA)

A Software Process Improvement and Its Quantification Technique
Takaji Fujiwara (Fujitsu Peripherals Limited, Japan)
Shigeru Yamada (Tottori University, Japan)

A Comparative Study of Classification Algorithms for Network Intrusion Detection
Taghi M. Khoshgoftaar (Florida Atlantic University, USA)
Kehan Gao (Florida Atlantic University, USA)
Yunling Wang (Florida Atlantic University, USA)

Evaluating Clustering Techniques for Network Intrusion Detection
Shi Zhong (Florida Atlantic University, USA)
Taghi M. Khoshgoftaar (Florida Atlantic University, USA)
Naeem Seliya (Florida Atlantic University, USA)

Subsystem Identifier as a Software Quality Predictor
Taghi M. Khoshgoftaar (Florida Atlantic University, USA)
Andres Folleco (Florida Atlantic University, USA)

SESSION 11

Friday, August 6, 10:15 am – 11:45 am

Quality of Education
Chair: Che-Jen Chuang (Vanung University, Taiwan)

A Note on the Distribution Fairness Score Function
Zhenmin Chen (Florida International University, USA)
Chi Zhang (Florida International University, USA)

Quality Service of Students' Perceptions: In Taiwan's Technological and Vocational Higher Education Sector
Shyi-Huey Wu (Vanung University, USA)

Study of Customer Satisfaction upon Service Quality and Commercial Friendship – Example of a Sports Goods Company
Che-Jen Chuang (Vanung University, Taiwan)
Jui-Chuan Yang (Vanung University, Taiwan)
Bo-Chin Huang (Vanung University, Taiwan)

The Identification Tendency and Difference of Physical Education Attitude in College Student
Jui-Chuan Yang (Vanung University, Taiwan)
Sun-Chin Yang (Vanung University, Taiwan)
Shiow-Chyn Jeng (Vanung University, Taiwan)

12:00 noon – 1:00 pm   Lunch

SESSION 12

Friday, August 6, 1:15 pm – 2:45 pm

Reliability and Maintenance Modeling
Chair: Elsayed A. Elsayed (Rutgers University, USA)

Recursive Method for Reliability Evaluation of Strict Circular Consecutive-k-out-of-n:F System
Yoichi Higashiyama (Ehime University, Japan)

Optimisation of Ventilation Layout Design
T. T. Wong (The Hong Kong Polytechnic University, Hong Kong)
T. Y. Cheung (The Hong Kong Polytechnic University, Hong Kong)
K. C. Heung (The Hong Kong Polytechnic University, Hong Kong)

Sze Ming Wu (The Hong Kong Polytechnic University, Hong Kong)
K. S. Fung (Hong Kong Institute of Vocational Education, Hong Kong

*Maintenance Policy of a System with Several Modes
of Deterioration*

Bassem Saassouh (University of Technologie of Troyes, France)
Laurence Dieulle (University of Technologie of Troyes, France)
Antoine Grall (University of Technologie of Troyes, France)

Maintenance of Continuously Monitored Degrading Systems

Haitao Liao (Rutgers University, USA)
Ling-Yau Chan (The University of Hong Kong, Hong Kong)
Elsayed A. Elsayed (Rutgers University, USA)

SESSION 13

Friday, August 6, 1:15 pm – 2:45 pm

Quality Engineering and Optimization

Chair: Ming-Wei Lu (DaimlerChrysler Corporation, USA)

Monitoring of Unequal Length Batch Processes

Ariane Ferreira-Porto-Rosa (Ecole des Mines de Nantes / IRCCyN, France)
Philippe Castagliola (Ecole des Mines de Nantes / IRCCyN, France)

Bivariate Process Capability Indices for Non-Normal Distributions

José-Victor García-Castellanos (Ecole des Mines de Nantes / IRCCyN, France)
Philippe Castagliola (Ecole des Mines de Nantes / IRCCyN, France)

*Application of Taguchi Dynamic Parametric Design for the
Optimal Combination of UV Ink Photoinitiators*

Jhy-Ping Jhang (Hua Fan University, Taiwan)
Kuo Hwa Lin (Hua Fan University, Taiwan)
Gro Ger Huang (Hua Fan University, Taiwan)

A 2-Stage Cumulative Quantity Control Chart

Jintao Ouyang (The University of Hong Kong, Hong Kong)
Ling-Yau Chan (The University of Hong Kong, Hong Kong)

2:45 pm – 3:00 pm   Coffee Break

SESSION 14

Friday, August 6, 3:00 pm – 4:30 pm

Software Reliability Modeling

Chair: Mitsuhiro Kimura (Hosei University, Japan)

A Method for Exact MTBF Evaluation of Repairable Systems

S. Dharmaraja (Indian Institute of Technology Delhi, India)
Suprasad Amari (Relex Software Corp., USA)

*Software Release Policy with Reliability Requirement Based on a
Non-Gaussian Kalman Filter Model*

Yen-Chang Chang (Vanung University, Taiwan)
Ching-Ti Liu (University of California at Los Angeles, USA)

*Software Reliability Assessment Methods for Integration Testing in
Distributed Development Environment*

Yoshinobu Tamura (Tottori University of Environmental Studies, Japan)
Shigeru Yamada (Tottori University, Japan)

*Stochastic Differential Equation Modeling for Testing-Effort
Dependent Software Reliability Assessment*

Shinji Inoue (Tottori University, Japan)
Shigeru Yamada (Tottori University, Japan)

SESSION 15

Friday, August 6, 3:00 pm – 4:30 pm

Information Systems and Routines Analysis

Chair: Hurdy Su (Sususing Co Ltd., Taiwan)

An Evaluation of ISMS by SEE CMM Chart

Kuo-Tung Chen (Tri-East Corporation, Taiwan)
Keng-Kuang Han (Exsior Data & Information Technology, Inc., Taiwan)
Jaw-Sin Su (Chinese Culture University, Taiwan)
Zhi-Yuan Liu (Nankai University, China)

Staffs' Response and Service Improvement in High Education

Hengsheng Chen (Chinese Culture University, Taiwan)

To Improve the Individual Tour's Schedule Arrangement

Yung Long Liu (Hsing Wu College, Taiwan)
Jaw-Sin Su (Chinese Culture University, Taiwan)
Pe-Ling Wu (Chien Kuo Institute of Technology, Taiwan)

Increasing More Efficiency through Information System on MNE

Shi-Huai Lin (Chinese Culture University, Taiwan)
Jing-Lun Han (Nankai University, China)

SATURDAY, AUGUST 7, 2004

SESSION 16

Saturday, August 7, 8:30 am – 10:00 am

Key Words Technique and Application

Chair: Huey-Ming Lee (Chinese Culture University, Taiwan)

A Study on Keyless-In-Context Technique And Application

Homer Wu (Chinese Culture University, Taiwan)
Hurdy Su (Sususing Co Ltd., Taiwan)

Apply Bhattacharya's Graphical Method to Stable Product Growth

Juei-Yang Su (Rhodes University, Taiwan)
J. Baxter (Rhodes University, Taiwan)

*On Using Bayesian Approach in Recognizing Chinese Electronic
Bookstore Web Sites*

Chong-Yen Lee (Chinese Culture University, Taiwan)

A

A Fuzzy Inventory Model without Backorder

Huey-Ming Lee (Chinese Culture University, Taiwan)
Jershan Chiang (Chinese Culture University, Taiwan)
Tsung-Yen Lee (Bank of Overseas Chinese, Taiwan)
Shu-Yen Lee (China Engineering Consultants, Inc., Taiwan)

SESSION 17

Saturday, August 7, 8:30 am – 10:00 am

Software Reliability and Process Improvements

Chair: Hoang Pham (Rutgers University, USA)

A Software Reliability Growth Model with Testing-Coverage Maturity Process

Takafumi Yamamoto (Tottori University, Japan)
Shinji Inoue (Tottori University, Japan)
Shigeru Yamada (Tottori University, Japan)

A Software Reliability Assessment Tool for the System Testing Phase in Distributed Development Environment

Yoshihiro Nodohara (Tottori University, Japan)
Yoshinobu Tamura (Tottori University, Japan)
Shigeru Yamada (Tottori University, Japan)

The CMMI - More Than Just Process

Greg Twaites (General Dynamics, USA)
Jim Collofello (Arizona State University, USA)
Fran Zenzen (General Dynamics Decision Systems, USA)

10:00 am – 10:15 am   Coffee Break

SESSION 18

Saturday, August 7, 10:15 am – 11:45 am

Reliability Optimization

Chair: Balbir S. Dhillon (University of Ottawa, Canada)

Designing Cost-Effective Water Distribution Systems Including Pumps and Storage Tanks: Application of Genetic Algorithms

Dagnachew Aklog (Tottori University, Japan)
Yoshihiko Hosoi (Tottori University, Japan)
Takanori Masuda (Tottori University, Japan)

Optimal Cost-Effective Design of Complex Systems

Suprasad V. Amari (Relex Software Corp., USA)
Hoang Pham (Rutgers University, USA)

Human Error in Medication

Balbir S. Dhillon (University of Ottawa, Canada)

From Reliability Demonstration to Reliability Development: Challenges and Opportunities

Jing Ling (DaimlerChrysler Corporation, USA)

SESSION 19

Saturday, August 7, 10:15 am – 11:45 am

Quality Improvements

Chair: Gordon J. Savage (University of Waterloo, Canada)

Replicate or Duplicate Measurements - The Consequence of Misdiagnosis: A Case Study

Shane O'Neill (Institute of Technology Sligo, Ireland)
John Donovan (Institute of Technology Sligo, Ireland)

An Analysis of Errors in Client Server Systems

Muneo Takahashi (Toin University of Yokohama, Japan)
Eisuke Inada (Toin University of Yokohama, Japan)
Takao Shimonura (Tokushima University, Japan)

Improving the Quality of Street Furniture Design

Kin Wai Michael Siu (The Hong Kong Polytechnic University, Hong Kong)

Probabilistic Robust Design of Multiple Response Systems for Functional Design for Six Sigma

Kwan Ryoo (University of Waterloo, Canada)
Young Kap Son (University of Waterloo, Canada)
Gordon J. Savage (University of Waterloo, Canada)

12:00 pm   Adjourn

PRESENTATION

The allotted time for presentation is about 22 minutes. Please prepare your presentation using Power Point since only computer projectors will be used for presentations at the conference. Computer laptop and projectors will be provided.

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