



58th Annual Fall Technical Conference

Statistics & Quality - Empowering Success



October 2-3, 2014

Omni Richmond
 Richmond, VA

<http://asq.org/conferences/fall-technical/>

Co-sponsored by:



ASA
 AMERICAN STATISTICAL
 ASSOCIATION

SECTION ON PHYSICAL AND
 ENGINEERING SCIENCES

QUALITY AND PRODUCTIVITY SECTION



**Chemical and Process
 Industries Division**
The Global Voice of Quality™



**Statistics
 Division**
The Global Voice of Quality™

You are invited to attend the 58th Annual Fall Technical Conference held this year in Richmond, VA. This conference is the premier forum to discuss topics at the interface of statistics and quality. The theme of this year's conference is "Quality and Statistics: Empowering Success". The goal is to engage researchers and practitioners in a dialogue that leads to more effective use of statistics to improve quality. The conference will serve to bring innovations in statistical methodologies and quality tools to the forefront. You will have the opportunity to meet informally and exchange views with speakers and colleagues during breaks and in the hospitality suite.

Council Meetings

Three of the sponsoring organizations (Chemical & Process Industries & Statistics Divisions of ASQ and the Quality & Productivity Section of ASA) will also hold council meetings during the conference (days and times TBA). The council meetings are an opportunity for those who wish to become involved in the activities of the societies to become better informed. Please check the conference website (<http://asq.org/conferences/fall-technical/>) for more information on dates, times, room locations, and other meetings of interest.

Hospitality Suite

The Annual Fall Technical Conference and the officers of the sponsoring organizations host a hospitality suite each year. This plays a vital role in the strategic operations of the divisions. We welcome new faces and new perspectives on division operations as well as share technical insights with colleagues in a friendly, informal atmosphere. Check at the registration desk for hospitality suite location and hours of operation. Please come to meet us in Richmond!

Accommodations

A block of rooms is available at the Omni Richmond through September 9, 2014. Conference room rates are \$149/night (single/double rate), plus taxes. To make reservations, please call the hotel direct at (804) 344-7000 and mention the Fall Tech Conference to obtain the conference room rate (or visit <http://www.omnihotels.com/FindAHotel/Richmond/MeetingFacilities/ASQASA58thAnnualFallTechnicalConference.aspx> for online reservations). Please keep in mind that ASA/ASQ is counting on attendees to use the conference hotel to offset catering and administrative costs.

Travel Arrangements

Travel arrangements from the airport to the hotel are the responsibility of the attendee. The Omni Richmond is a short 18 minute cab ride from the airport. Rental cars are not necessary as everything is within a short walking distance. However, if you do choose to rent a car, parking is available at the hotel for \$20/day. More information is available on the conference website.

Cancellations and Refunds

A complete refund of conference registration fees will be given if you cancel prior to September 11, 2014. Cancellations received on or after this date will incur a \$145 cancellation fee.

Short Courses will be offered on Wednesday, October 1 from 8:30 a.m. to 5:30 p.m. The fee for each course is \$300 and includes coffee breaks and lunch. Registration is limited.

Definitive Screening Designs: What, Why and How
 by Bradley Jones & Christopher Nachtsheim
 Sponsored by ASA-Q&P

Definitive Screening Designs (DSDs) are a new class of designs for factor screening that Professor Doug Montgomery has called, "probably the most important development in design of experiments in the last 50 years." These designs are unique in that screening is performed at three levels for quantitative factors, and, if just a few active effects are found, the designs project to highly efficient response surface designs in the active factors. When this is the case, screening and optimization can then be accomplished in one step, avoiding the need for follow-up experiments. The most complete support for design and analysis of DSDs is in JMP. However, the latest version of Design Expert creates these designs and there is also a macro for generating them in Minitab. Students having JMP on their laptops are welcome to bring them so they can follow along. We will provide paper handouts of the slides as well as electronic versions of JMP journals. This course starts by introducing DSDs in their simplest form (where all the factors are quantitative) and demonstrating their extra capabilities over standard two-level fractional factorial and Plackett-Burman screening designs. We then show how to generate DSDs for scenarios where there are additional two-level categorical factors. Finally, we show how to orthogonally block these designs if the factors are all quantitative or if there is a mix of quantitative and two-level categorical factors. We introduce each new wrinkle of design construction with a practical example including data. We then provide ideas for analysis that take full advantage of the special capabilities of these designs.

Text Mining and Unstructured Data Analysis Methods
 by Heath Rushing
 Sponsored by ASA-SPES

It is estimated that approximately 80% of data in most organizations is unstructured, such as text. This 8 hour course will provide an overview of new methods easily implemented to find previously unknown relationships from a collection of unstructured data. Techniques used for predictive analytics and data mining are also explored with text from various sources such as email, survey comments, incident reports, free form data fields, websites, research reports, blogs, social media, and other text fields to discover potentially useful and actionable business insights. Multiple demonstrations with example datasets that include applications to fraud detection, accident investigations, auto insurance policies, medical, and other meaningful case studies applicable to ASQ/ASA interests. This will be a hands-on workshop where participants will be guided through end-to-end examples starting from assembling disparate text sources relevant to a business problem, followed by creating a structured database, then applying analytical and graphical methods such as decision trees, principal components, and cluster analysis to finally discovering useful and actionable relationships. Several different software packages such as JMP, Statistica, and SAS Text Miner will be used. A student who successfully completes this course

will: (1) know what text mining and natural language processing is and how they differ from data mining and predictive analytics, (2) understand the role of enabling technologies in the evolution of text mining methodologies, (3) know the different areas of text analytics, (4) be able to apply data mining techniques such as decision trees, cluster analysis, and logistic regression to translate intermediate text mining data to decision quality results, (5) understand text mining is a subset of natural language processing, (6) understand the role of latent semantic analysis using singular value decomposition, and (7) understand how to use a standard text mining software product.

Effective Presentations for Statisticians
 by Stephanie P. DeHart and Jennifer H. Van Mullekom
 Sponsored by ASQ-CPID

Effective communication skills separate the great employees from the good employees in any field. Statistics is not an exception. Several years ago, past ASA president Bob Rodriguez had the opportunity to sit down with the leadership of Fortune 500 companies. These leaders had extremely positive comments about the value statisticians bring to their businesses. However, these leaders felt statisticians needed to improve their soft skills in areas deemed "Career Success Factors" in order to maximize their contributions. The Effective Presentations for Statisticians course is one of many offerings resulting from past ASA President Bob Rodriguez's Career Success Factors Workgroup. The course is tailored to statisticians specifically and provides helpful information for improving the participant's presentations skills in a variety of areas. Topics include: (1) preparing Slides, (2) effective use of software and visual media, (3) timing and practice, (4) crafting your argument, (5) knowing your audience, (6) presenting statistics to non-statisticians, (7) presenting via web conferencing tools, and a few more! The course includes a combination of lecture and hands-on activities. Take this opportunity to polish your presentations skills and increase your influence in decision-making processes! This course is relevant to careers in all areas of statistics including academia, industry, healthcare, business, and government.

Reliability Data Analysis Experiences
 by William Meeker
 Sponsored by ASQ-STAT

Reliability assurance processes in manufacturing industries require data-driven information for making product-design decisions. Life tests, accelerated life tests, and accelerated degradation tests are commonly used to collect reliability data. Data from products in the field provide another important source of useful reliability information. Due to complications like censoring, multiple failure modes, and the need for extrapolation, these reliability studies typically yield data that require special statistical methods. This presentation will describe the analyses of a collection of different life data analysis applications in the area of product reliability. Methods used in the analyses include Weibull and lognormal analysis, analysis of data with multiple failure modes, accelerated test analysis, analysis of both repeated measures and destructive degradation data and the analysis of recurrence data from repairable systems.

58th Annual Fall Technical Conference Registration

ASQ Customer Care
PO Box 3005
Milwaukee, WI 53201-3005

Complete this form and mail to the address above (you may wish to keep a copy for your records) or fax to 414-272-1734. Attn: ASQ Customer Care. Your registration will be confirmed by mail within 2 weeks of receipt. To register online, please visit <http://asq.org/conferences/fall-technical/>. Contact ASQ Customer Care at asq@asq.org, with any questions or changes related to registration.

PERSONAL INFORMATION

Member Numbers: ASQ ASA
 First Name for Badge* _____
 Title: Mr. Mrs. Ms. Dr.
 First Name* _____
 Last Name* _____
 Job Title _____
 Preferred Mailing Address: Home Business
 Business/Company: _____
 Address* _____
 City/State* _____
 Zip/Postal Code* _____
 Country* _____
 Telephone Number* _____
 Fax Number _____
 E-mail Address* _____
 Yes, you may release my e-mail address to conference sponsors and exhibitors.

SPECIAL NEEDS

Please list any special needs, disabilities, and/or dietary restrictions that we may address to make your participation more enjoyable:

CONFERENCE REGISTRATION

2 day 1 Day 1 Day Student
 THR FRI
 Regular Registration on/before Sept. 11, 2014: \$335 \$235 \$235 \$135
 Late Registration after Sept. 11, 2014: \$385 \$285 \$285 \$185
 * Conference ID badges will be required for all events.
 * Hotel arrangement, travel, and short courses are NOT included in the conference fees.

SHORT COURSES

Definitive Screening Designs: Why, What, How \$300
 Text Mining and Unstructured Data Analysis Methods \$300
 Effective Presentations for Statisticians \$300
 Reliability Data Analysis Experiences \$300

PAYMENT

Total Payment* \$ _____
 Payment Type: * Check (sent by mail and made payable to ASQ)
 MasterCard Visa American Express
 Credit Card Number _____
 Expiration Date _____
 Cardholder Name _____
 Cardholder Signature _____

HOTEL REGISTRATION

Reservations for the Omni Richmond may be made on the hotel website or by calling the hotel at (804) 344-7000.
 *denotes required information

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Thursday, October 2, 2014

7:00 REGISTRATION DESK OPENS

8:00 - 9:00 Presentation of **GERALD J. HAHN Q&P ACHIEVEMENT AWARD**
WELCOME / PLENARY SESSION
Michael Hamada
Los Alamos National Laboratory

Session 1

9:15 - 10:00	A Using Big Data to Evaluate Computer Vision Systems Kurt DeMaagd <i>Sight Machine</i>	B A Two-Stage Risk Model Building and Evaluation in Reject Inference Angang Zhang & Xinwei Deng <i>Virginia Tech</i> Justin Wang & Justin Hobart <i>Microsoft Corp.</i>	C Definitive Screening Designs Bradley Jones <i>JMP Division/SAS</i>
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Moderators Joel Smith (Minitab, Inc.), Byron Smucker (Miami Univ), Liz Schiferl (Lubrizol Corp.)

10:00 - 10:30 BREAK

Session 2

10:30 - 12:00	A STAT Invited Session Strategies for Addressing Large, Complex Unstructured problems Alexa DiBenedetto <i>Roger Hoerl</i> <i>Union College</i>	B DOE Case Studies The Tyvek® Medical Packaging Transition Project: "Out with the Old, In with the New" Jennifer H Van Mullekom <i>DuPont</i>	C Technometrics Invited Session A D-Optimal Design for Estimation of Parameters of an Exponential-Linear Growth Curve of Nano-Structures Li Zhu <i>Tirthankar Dasgupta</i> <i>Qiang Huang</i> <i>Harvard Univ</i>
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Moderators Eduardo Santiago (Minitab, Inc.), Christine Anderson-Cook (Los Alamos Nat Lab), Bill Woodall (Virginia Tech)

12:15 - 1:45 LUNCHEON
Harry Kollatz
Senior Writer, Richmond Magazine

Session 3

2:00 - 3:30	A Multivariate SPC Autocorrelation and the Hotelling T2 Control Chart Erik Vanhatalo <i>Lulea Univ of Tech</i> Murat Kulahci <i>Technical Univ of Denmark</i>	B Design Evaluation Split-Plots Pros and Cons Pat Whitcomb <i>Shari Kraber</i> <i>Wayne Adams</i> <i>Stat-Ease, Inc.</i>	C George Box Tribute George Box's Contributions to Quality and Statistics J. Stuart Hunter <i>Conrad Fung</i> <i>William Hill</i> <i>Joanne R. Wendelberger</i>
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Moderators Maria Weese (Miami Univ), Greg Piepel (Pacific Northwest Nat Lab), Flor Castillo (SABIC)

4:00 - 5:00 Presentation of **WILLIAM G. HUNTER AWARD**
W. J. YOUDEN MEMORIAL ADDRESS
Connie Borror
Arizona State University
 Title: Quality and Statistics: Now THAT'S Entertainment!

General Conference Chair
David Edwards, *Virginia Commonwealth Univ*

Short Course Chair
Anne Ryan, *Virginia Tech*

Program Committee
 ASA-Q&P: Ming Li, *REANCON.COM*
 ASA-SPEs: Zhen Wang, *Lubrizol*
 ASQ-CPID (Chair): Flor Castillo, *SABIC*
 ASQ-STAT: Eduardo Santiago, *Minitab, Inc.*

Publicity Chair
Barbara Wendelberger, *University of Wisconsin*

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Friday, October 3, 2014

7:30 REGISTRATION DESK OPENS

Session 4

8:00 - 9:30	A Q&P Invited Session Application of Statistical Engineering to Mixture Problems with Process Variables Roger Hoerl <i>Gabriella Bucci</i> <i>Union College</i>	B CPID Invited Session Split-Plot Designs for Multistage Processes Murat Kulahci <i>Technical Univ of Denmark</i> John Tyssedal <i>Lulea Univ of Technology</i>	C JQT Invited Session Application of Bayesian Methods in Reliability Data Analysis Ming Li <i>REANCON.COM</i> Bill Meeker <i>Iowa State Univ</i>
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Moderators Ming Li (REANCON.com), Connie Borror (Arizona State Univ), Brad Jones (JMP Division/SAS)

9:30 - 10:00 BREAK

Session 5

10:00 - 11:30	A SPES Invited Session New Statistical Tools for Uncertainty Quantification Using Massive Deterministic Model Output Brian J. Reich <i>NC State Univ</i>	B Screening Designs No Confounding Designs of 20 and 24 Runs-Alternatives to Resolution IV Screening Designs Brian B. Stone <i>Air Force Institute of Technology</i> Douglas Montgomery <i>Arizona State Univ</i> Rachel Silvestrini <i>Naval Postgraduate School</i> Bradley Jones <i>JMP Division/SAS</i>	C QE Invited Session Identifying Process Dynamics through a Two-Level Factorial Experiment Peder Lundkvist <i>Lulea Univ of Technology</i>
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Moderators Zhen Wang (Lubrizol Corp.), Anne Ryan (Virginia Tech), Pete Parker (NASA)

11:45 - 1:15 LUNCHEON
Energizing the Future of the Statistics Profession and the ASA
Ronald L. Wasserstein
ASA Executive Director

Session 6

1:30 - 3:00	A Modeling for DOE A Prediction Interval Estimator for the Original Response when using Box-Cox Transformations Marcus B. Perry <i>Michael L. Walker</i> <i>Univ of Alabama</i>	B Statistical Engineering Advancing Statistical Engineering through a Department of Defense and NASA Partnership Peter A. Parker <i>NASA</i> Laura J. Freeman <i>Institute for Defense Analysis</i>	C Special Applications Issues in Planning Experiments for Highly Constrained Regions Geoff Vining <i>Virginia Tech</i>
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Moderators Stephanie DeHart (DuPont), Willis Jensen (W.L. Gore & Assoc), Brenda Bishop (Unsys)

4:00 - 5:00 Development of Extreme Non-Hurricane Wind Speed Maps for Structural Design from Meteorological Station Measurements in the Contiguous United States
Adam L. Pintar
Emil Simiu
Nat Institute of Standards and Technology