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## EDUCATION

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May 1994 Ph.D. (Statistics) Texas A&M University.  
Dissertation title: "Statistical Process Control for Correlated Data". Also concentrated on other quality control topics, time series analysis, and statistical computing. Chair of advisory committee: Dr. M. T. Longnecker.

Aug 1988 M.S. (Mathematics) Texas A&M University.  
Emphasis on analysis for applications, numerical analysis. Minor in Statistics.

Aug 1986 B.S. (Mathematics) Stephen F. Austin State University. Second major in French.

## EXPERIENCE

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Jan 2008 – present, Senior Consultant,  
Predictum, Inc. Statistical consulting and  
programming using JMP.

Mar 2004 – present, Member of Technical Staff

Apr 2002 – Mar 2004, Statistician

May 1998 – Apr 2002, ATDF Statistician,  
International SEMATECH and ISMI

### Significant Technical Accomplishments

ISMI Statistics Council, a group of member company statisticians whose mission is to forward the advancement of statistical methods in all areas of our members' business processes.

Co-authored a document to the AIAG whose purpose is to begin communication between the

automotive and semiconductor industries as pertains to TS/ISO standard requirements.

Authored a major portion of the equipment chamber matching tech transfer document. The equipment chamber matching method contains a detailed description of the steps involved in assessment, collecting data, analyzing data, performing adjustments and reviewing success criteria.

Developed a system for tracking the Health of the ATDF SPC efforts. Chart stability, centering, and limits are evaluated and tracked in the system, which is web-based. Health can be calculated for a chart or group of charts, and is easily tracked over time. Health metric goals have consistently been met.

Developed an SPC web system which is a daily update of all SPC in the wafer fab. The web page features a summary by area, individual pages for each process with easy-to-read graphs and a table containing the data and Western Electric rule violations. This web page added significant capability to the ATDF's ability to manage process control by enhancing the data collection abilities of WorkStream.

Developed system for monitoring continuous processing data from ultra-pure water system. Process was modeled with an autoregressive process of order 5. The one-and two-step ahead prediction errors were calculated, with a multivariate EWMA chart placed on the errors. The system signals faster than a Shewhart chart on raw data, while decreasing the false alarm rate, when moderate shifts in the process are present.

Chaired Design & Structure team of Industry Economic Model project. Implemented new methodology in model which is a reflection of wafer fab distribution across the industry. Led

efforts to improve model performance as well as statistical analysis of model results.

Supported numerous cross-functional teams, including Gate Stack Engineering Working Group, Interconnect baseline 8-D team (fix yield drop between M2 and FT), FEP High-k/METS team, ATDF Change Review Team, various ATDF SPC teams.

Chaired many symposia, developed and maintained web pages for many symposia.

Recognized as an expert in Statistical Process Control, Design and Analysis of Experiments, including designs for batch processing, split plot and strip plot designs, JMP, web programming, and data integrity.

Oct 1994 – May 1998 Statistician, Lead Engineer – Harris Corporation, Semiconductor Sector, Findlay, Ohio. Statistical consulting and training for operators, engineers and managers in three wafer fabs. Experimental design and analysis, partial least squares and principal components analysis of multiresponse data, sampling plans, variance components analysis, statistical process control, gauge studies, capability studies, analysis of non-standard data. Wrote a number of technical reports on specialized statistical techniques. Owned ISO 9002 and QS 9000 element 4.20 Statistical Techniques. Responsible for project control of statistics projects. Led and participated on many teams, including developing methods for calibration, statistical determination of reject limits (known good die), implementing electronic SPC, among others.

Mar 1992 – Dec 1993 Research Assistantship – Temple Inland Forest Products Division, Silsby, Texas. Statistical consulting for a paper mill. Continuous process control, wrote a process control manual for engineers, technicians, and

managers. Developed time series models for various processes in the plant and implemented control charts based on these time series models.

Dec 1989 – May 1990 Internship – Westinghouse Electronic Assembly Plant, College Station, Texas. Statistical process control, design and analysis of experiments, design of sampling plans, developed and taught an introductory statistics course for engineers.

May 1989 – Aug 1989 Statistical quality control research– Shell research grant. Adapted SAS/QC examples for instructional use.

Aug 1988 – May 1993 Tutored mathematics and statistics in a one-on-one environment. Students were undergraduates from all majors who needed personalized attention. Almost all students showed a grade increase since tutoring began.

Aug 1986 – May 1991 Taught a variety of math and statistics classes, including calculus I, calculus III, engineering statistics, introduction to statistics, and statistics for business majors. Obtained excellent student and faculty evaluations.

## COMPUTER EXPERIENCE

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Environments: Windows, VMS, Unix

Languages: JMP Scripting Language, Visual Basic for Applications, Fortran, C, HTML, RPL

Statistical Software Packages: R, JMP, RS/1, SAS, S-plus, Statistica, Timeslab, Simca-P

Miscellaneous Software Packages: Microsoft Office, TeX

## PROFESSIONAL AFFILIATIONS AND SERVICE

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American Statistic Association

Secretary of the Quality and Productivity Section of the ASA, 2008–2009.

Senior Member of American Society for Quality

Secretary of the Austin chapter of the American Statistical Association, 2004–2008

Technometrics Book Reviewer

## PUBLICATIONS AND PRESENTATIONS

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Michelson, Diane K. (2009), “Estimation of Variability from Processes with Nested Structure,” presentation to 6th ISMI Symposium on Manufacturing Effectiveness, to appear.

Michelson, Diane K. (2008), Invited panel discussant, “Advanced JMP Scripting,” JMP Discovery Conference.

Michelson, Diane K. (2008), “Overview of Measurement Systems Analysis,” book chapter in Encyclopedia of Statistics in Quality and Reliability, John Wiley & Sons.

Michelson, Diane K. (2007), Discussant in “Consulting from a Distance: Web-based Analytics for Statistical Consulting,” session at the Joint Statistical Meetings.

Hussein, Gondran, and Michelson (2007), “Atomic Force Microscope Study of 3D Nanostructure Sidewalls,” Nanotechnology.

Michelson, Diane K. (2006), “Life as a Statistician in the Semiconductor Industry,” invited speaker in the SPES Marquardt Memorial Industrial Speakers Program, University of Texas, Arlington.

Michelson, Diane K. and Martinez, Angela N. (2006), “SPC Sampling Frequency,” presentation

to 3rd ISMI Symposium on Manufacturing Effectiveness, refereed proceedings publication.

Sparks, Michelson, and Martinez (2006), "Evaluation of the Contamination Mapping Capabilities with a TXRF," presentation at the Denver X-ray Conference.

Michelson, Diane K. (2006), Invited speaker at JMP User Conference, JMP Scripting Language panel discussion.

Sparks, Barnett, Michelson, Gondran, Song, Martinez, Takahara, Murakami, Kinashi (2006) "Advanced TXRF Analysis: Mapping Metallic Contamination and Background Reduction for Measurements on High-k Materials," poster at Ultra Clean Processing of Semiconductor Surfaces.

Sparks, Michelson, and Martinez (2006), "Contamination Mapping with a Total Reflection X-ray Fluorescence Spectrometer - Should We Bother?," presentation at the Surface Preparation and Cleaning Conference.

Michelson, Diane K. (2005), Review of Analysis of Variance for Random Models, Vol. 1: Balanced Data, Theory, Methods, Applications and Data Analysis, by Sahai and Ojeda, Technometrics, 47, p233.

Bunday, Michelson, Allgair, Tam, Chase-Colin, Dajczman, Adan, Har-Zvi (2005), "CD SEM Metrology Macro CD Technology - Beyond the Average," Proceedings of SPIE, v5752, pp 111-126.

Gondran, C.F.H. and Michelson, Diane K. (2005), "Effect of Probe Tip Size on AFM Roughness Values for Very Smooth Samples," Journal of Vacuum Science and Technology A, Volume 24, Issue 4, pp. 1185-1190.

Gondran, C.F.H. and Michelson, Diane K. (2004), "Sampling and Reference Concerns for Very High Resolution ARM," presented at ISTFA (refereed proceedings publication).

Carpio, Ronald A. and Michelson, Diane K. (2004), "Copper Plating Bath Concentration Monitoring for 200mm and 300mm Using a Chemometric Electroanalytical Method," published in V-EMT, <http://www.vertilog.com>.

Michelson, Diane K. (2004) "On the Use of Generalized P-Values to Test Variance Components," presentation to 1st ISMI Symposium on Manufacturing Effectiveness (refereed proceedings publication).

Michelson, Diane K. (2004) "On the Testing of Variance Components in a Fully Nested Model," presented at the Spring Research Conference.

Michelson, Diane K. (2003) Review of Components of Variance, by Cox and Solomon, Technometrics, Vol.45, No. 4..

Michelson, Diane K. (2003) "Case Studies of Batch Processing Experiments," presented at 20th ISMT Statistical Methods Symposium, Industrial Engineering Research Conference (refereed proceedings publication).

Michelson, Diane K. (2003) "Case Studies of Batch Processing Experiments," invited presentation at ASA Quality and Productivity Research Conference (proceedings publication).

Michelson, Diane K. (2002) "Testing Two Variance Components Models," presented at 19th ISMT Statistical Methods Symposium, International Conference on Modeling and Analysis of Semiconductor Manufacturing (proceedings publication).

Michelson, Diane K. (2001) Review of Applied Statistics for Engineers and Scientists, by Devore and Farnum, Technometrics, Vol. 43, No. 4.

Michelson, Diane K. (2001) "When is an F not an F?," presented at 18th ISMT Statistical Methods Symposium, ASA Quality and Productivity Research Conference.

Michelson, Diane K. (2000) "The Industrial Statistician's Guide to Principal Components Analysis," presented at 17th ISMT Statistical Methods Symposium, International Conference on Modeling and Analysis of Semiconductor Manufacturing (proceedings publication).

Michelson, D. and Prins, J. (1999) "Software for Univariate/Multivariate Exponentially Weighted Moving Average Control Chart," presented at AEC/APC Symposium XI (proceedings publication).

Michelson, D. and Weber, D. (1999) "Web-based SPC", presented at 16th ISMT Statistical Methods Symposium.

Michelson, D. and Kimmet, S. (1999) "An Application of Graeco-Latin Square Designs in the Semiconductor Industry", presented at American Statistical Association Spring Research Conference (proceedings publication).

Michelson, D. and Longnecker, M. (1998) "The Use of Multivariate EWMA Charts to Control Correlated Processes" presented at American Statistical Association Spring Research Conference (proceedings publication).

Michelson, Diane K. (1996) "A Data-driven Method for Calculating Control Limits for Particle Control Charts", presentation at SPIE's 1996 Symposium on Microelectronic Manufacturing, Austin, Texas (proceedings publication).

Michelson, Diane K. and Longnecker, M. (1993) "Exponentially Weighted Moving Average Control Schemes on Autocorrelated Data", Department of Statistics, Texas A&M University.

Michelson, Diane K. (1993) "Controlling Correlated Processes Using EWMA's on Forecast Errors", Annual Conference of the Southeast Texas Chapter of the ASA, College Station, Texas.

Cook, D. and Michelson, D. (1992) "The Impact of Serial Correlation on Statistical Process Control Charts", Department of Industrial Engineering, Texas A&M University.

## KEY ORGANIZATIONAL ACCOMPLISHMENTS

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Invited session chair, 2009 Joint Statistical Meetings, "Career Advice for Female Industrial Statisticians," speakers: Martha Gardner, General Electric Company; Leslie Fowler, Freescale Semiconductor; Joanne Wendelberger, Los Alamos National Labs.

Invited session chair, 2009 Quality & Productivity Research Conference, "Statistical Leadership in Industry," speakers: Ron Snee, Tunnell Consulting; J.D. Williams, General Electric Company; Andy Brendler, IBM.

Invited session chair, 2008 Quality & Productivity Research Conference, "Industrial Split-lot Experimentation," speakers: James Lucas, J.M. Lucas & Associates; Jose Ramirez, W.L. Gore & Associates, Inc.; Heidi Arnouts, Universiteit Antwerpen.

Co-chair of fab productivity workshop on variability reduction and excursion control, 2007.

Chair of ISMI Statistical Methods Council, 2007-2009.

Member of organizing committee of Conference of Texas Statisticians, 2006–2007.

Session chair, multiple statistical methods sessions, ISMI Symposium on Manufacturing Effectiveness, 2004–2009.