

OBJECTIVE

Seek a position as Consulting Statistician or Executive Program Manager in Applied Mathematics, Statistics, Biostatistics, and Pattern Recognition methods. Design, manage development, and deploy analytical solutions for high dimensional, complex systems problems using intelligent, adaptive, mathematical and statistical methods. Expertise focuses on anticipated results for critical missions for business, high-tech, biomedical and pharmaceutical corporations and government at all levels, using hands-on and executive skills.

EXPERTISE

Executive Level Analytical Program Management

- All levels of quantitative program management, including:
 - Initiatives and Corporate Strategy development for analytics
 - Budget development
 - Funding attainment
 - Technical Staffing recruitment
 - On-Time Task Completion:
 - Analysis methodology development
 - Design, development, and delivery of analytical software
 - Final analysis and reporting

Corporate-Level Analytical Consultant

- Analytical specialties include:
 - comprehensive statistical methods
 - neural network modeling
 - pattern recognition methods
 - complex systems data mining
 - genetic algorithms
 - wavelet, chaos theoretic, and fractal geometry analyses
 - signal processing and spectral analyses
 - feature extraction and data compression
 - Monte Carlo simulations
 - clustering analyses
 - classification analyses
 - prediction methods
 - reliability and risk analyses
 - optimization methods

ANALYSIS PACKAGES AND PROGRAMMING LANGUAGES

SAS NeuralWare Predict MS Office SPSS Mathematica C++ R JMP MatLab VB MS Access Java SQL Tcl

EXPERIENCE

2007 – present Pattern Informatics, LLC West Newbury, MA
President/Founder

- Principal consultant and Founder of Statistical and Applied Mathematical analysis consultancy. Activities include recruitment of associates for team-based consulting services in high

tech, biotech and corporate strategy management, marketing of consulting services, client project decision-driven analytical design, analysis, reporting, and facilitation of client operations changes made in support of analysis report.

- Client areas of application include:
 - Medical devices research, development and manufacturing
 - Pharmaceutical and Biotechnology research, development and manufacturing
 - High Technology research, development and manufacturing
 - Medical Outcomes Studies
 - Image and Spectral decomposition analysis, including complex sensor

Characterization

- Marketing analysis
- Professional Firms and Corporate Initiatives Analysis

2006 – 2007 Exponent, Inc. Natick, MA

Senior Managing Scientist

- Managing Consultant in the Exponent, Inc. consulting firm's Data and Statistical Analysis group responsible for statistical and applied mathematical project development and analyses for client companies.
- Activities included all marketing, proposal development and deployment of consulting projects for a wide range of client companies.

2000 – 2006 IBEX Process Technology/NeuMath, Inc. (C corp. restart)

Founder/CEO/Chairman

- Directed research, development and early customer sales of adaptive neural network and statistical software solutions for semiconductor manufacturing Yield and Process Tool Control.
- Established early-adopter customer base including KLA-Tencor, National Semiconductor, LAM Research, ST Microelectronics, IBM, International SEMATECH, Helix Technology.

EXPERIENCE (CONTINUED)

- Raised over \$12M in Venture Capital and Private Investment
- Formed world class technical mathematical/software team
- Invented and managed design, development and launch of 3 products:
 - Dynamic Neural Controller (for generic manufacturing tool control)
 - Dynamic Neural Controller (fab-wide enterprise architecture)
 - Yield Optimizer (for complex manufacturing Yield control)

1998-2001 NeuMath, Inc. (S-Corp.) West Newbury, MA

Founder and President

- Contracted as mathematician/statistician for complex problem solution design and implementation for biomedical, pharmaceutical, and biotech corporations.
- Customers included:
 - Abiomed, Inc.
 - Ariad Pharmaceuticals (genomic div. of Hoechst Pharmaceuticals)
 - SmithKline Pharmaceuticals
 - Pharmacia, Upjohn, and Searle
- Delivered series of lectures on evolutionary and adaptive computational methods as research analysis strategies at Univ. Mass. Medical Center (Department of Psychiatry) to graduate and medical students.

1984–1998 Digital Equipment Corporation Hudson, MA *Consulting and Principal Engineer, Advanced Development Quality and Reliability Assurance, Semiconductor Operations and Systems Reliability Group.*

- Acted as consulting mathematician/statistician for Digital's semiconductor division in R&D, manufacturing, and facilities engineering.
- Designed and implemented mathematical solutions to engineering teams in development of:
 - copper surface roughness metric invention via fractal geometry
 - automated pattern recognition for IC package wirebond inspection via image feature extraction and neural network classification
 - automation of plasma etch tool control and maintenance using neural network and genetic algorithm technologies
 - automated analysis of Ti:N stoichiometry for Auger spectroscopy via neural network pattern recognition and spectral decomposition techniques.
 - Design and analysis of experiments for new product process development
 - Developed Non-Homogeneous Poisson Renewal Process model for large VAX cluster reliability prediction
 - Designed reliability accelerated testing program for VAX computer systems.
 - Developed incoming reliability validation and test program for vendor product.
 - Model development and crash rate analysis of computer systems utilizing the branching Poisson process.
 - Developed Bayesian reliability estimation procedure for repairable systems.

EXPERIENCE (CONTINUED)

- Founded monthly lecture series on adaptive analytics: neural networks, expert systems, evolutionary computation, fractal geometry and chaos theoretics for research and development engineering.
- Taught lecture series on Advanced Mathematical Techniques for reliability analysis.

1984–1985 AT&T Bell Laboratories N. Andover, MA

Member of Technical Staff, Reliability Analysis

- Developed reliability models for complex switching systems.
- Developed reliability prediction model of lightning strike frequency and field service impact on telephone equipment.

1980–1984 Wang Laboratories Lowell, MA

Principal Engineer, Reliability and Quality Engineering

- Designed and analyzed corporate equipment burn-in program for computer systems.
- Developed designed experiments for quality engineering.
- Designed corporate reliability program analyses.
- Designed specifications and analyses for corporate quality product assessment.
- Developed incoming inspection program techniques and standards.
- Taught introductory reliability and quality statistics classes for engineering.

EDUCATION

1975 Cornell University Ithaca, NY B.S., Natural Resources (Wildlife Physiology) Major coursework : Biology and Ecology. 1979 Florida State University Tallahassee, FL M.S., Statistics. Major coursework : Mathematical and Applied Statistics

ADDITIONAL GRADUATE COURSEWORK

- Principles and Methods of Cognitive and Neural Modeling (1991), Boston University.

- Intelligent Decision and Control with Neural Networks (1996), Summer Professional Programs, MIT.
- Bio-Inspired and Cognitive Computing (2007), IEEE Boston

PUBLICATIONS

1. "Dynamic Neural Controller™ as an E-diagnostic Tool," Proceedings of the Asia AEC/APC Symposium IV, November 2006 (with A. Cao, W. Chan, W. Martin, C. Beal, G. Boone, A. Wong, and D. Kelly).
2. "Beta Test Results for a Yield Optimizer," Proceedings of the AEC/APC Symposium XVIII, September 2006 (with A. Cao, W. Martin, P. Fearon, L. Krott, and A. Dries).
3. "Significant yield improvement for semiconductor production line using NeuMath Yield Optimizer," GESTS International Transactions on Computer Science and Engineering, Vol. 29, No. 1, March 2006.
4. "A Neural Network-based Yield Optimizer for Semiconductor Manufacturing," Proceedings of the AEC/APC Symposium XVII, September 2005 (with A. Cao, W. Chan, W. Martin, C. Cuneo, and J. Hyde).
5. "Beta Test Results for a Yield Optimizer," Proceedings of the ISMI, September 2006 (with A. Cao, W. Martin, P. Fearon, L. Krott, and A. Dries).
6. "The Use of Unified APC/FDC in the Control of a Metal Etch Area," Proceedings, 15th IEEE/SEMI ASMC, May 2004 (with J. Hyde, W. Chan, and A. Cao).
7. "Impacts of Maintenance Input on the Prediction Accuracy of an APC Controller," Proceedings of the ASMC, May 2003 (with A. Cao and W. Chan).
8. "Using Maintenance Input Data to Increase the Prediction Accuracy of APC Strategies," Micro Magazine, June 2003 (with A. Cao and W. Chan).
9. "Impacts of Maintenance Input on the Prediction Accuracy of an APC Controller," Micro Magazine, March 2003 (with A. Cao and W. Chan).
10. "Using Neural Networks for Intelligent Plasma Etch Process Control," Solid State Technology, pp. 33–36, November 2002 (with L. Laurin).
11. "A Study in Dynamic Neural Control of Semiconductor Fabrication Processes," IEEE Transactions on Semiconductor Manufacturing, Vol. 13, No. 3, pp. 359–365, August 2000.
12. "Run-to-run Process Control of a Plasma Etch Process with Neural Network Modeling," Quality and Reliability Engineering International, Vol. 14, No. 4, pp. 247–260, 1998 (with M. Naimo and W. Ziminsky).
13. "Neural Network Optimization Routines for Plasma Etch Process Control and Efficient Parts replacement," Proceedings of the 2nd International Symposium on Process Control, Diagnostics, and Modeling in Semiconductor Manufacturing, pp. 28–37, November 1997 (with D.L. Sniderman and C. Klimasauskas).
14. "Plasma Etch Process Control with a Neural Network-based Prediction Model," Proceedings of the 2nd International Symposium on Process Control, Diagnostics, and Modeling in Semiconductor Manufacturing, pp. 19–27, November 1997 (with D.L. Sniderman and C. Klimasauskas).
15. "Dynamic Neural Control for Plasma Etch Process," IEEE Transactions on Neural Networks, Vol. 8, No.4, pp. 883–901, May 1997 (with D. L. Sniderman and C. Klimasauskas).
16. "Modeling Outcome of Mechanical Intervention after Cardiac Surgery," Proceedings of the 1995 World Congress on Neural Networks, Vol. II, July 1995 (with P.I. Singh).
17. "Discrimination of Surface Textures Using Fractal Methods," Material Research Society Symposium Proceedings, Vol. 367, pp. 113–118, 1995 (with J.M. Hyde and T. Giversen).

PUBLICATIONS (CONTINUED)

18. "SRAM Bitmap Shape Recognition and Sorting using Neural Networks," IEEE Transactions on Semiconductor Manufacturing, Vol. 8, No. 3, pp. 326–332, 1995 (with R.S. Collica and W. Martin).

19. "Target Factor and Neural Network Analyses Applied to Titanium Nitride Composition Recognition by AES," *Surface and Interface Analysis*. Vol. 23, pp. 495–505, July 1995 (with A.L. Testoni and L.A. LeTarte).

20. "Neural Network Approach to Automated Wirebond Defect Classification," *Proceedings of the ANNIE '94*, November 1994 (with A. McGowan and C. Reed). "Estimation of the Weibull Renewal Function," *Microelectronics and Reliability*. Vol. 28, No. 5, pp. 751–756, 1988 (with W. Chan).

PATENTS

1. "Intelligent Modeling of Process and Tool Health," U.S. Patent No. 7020569, September 2003 (with A. Cao and W. Chan). "Intelligent Control for Process Optimization and Parts Maintenance," U.S. Patent No. 6970857, September 2002 (with W. Chan and A. Cao).

2. "Advance Failure Prediction," U.S. Patent No. 6915173, August 2002 (with W. Chan and E.A. Rietman).

3. "Large Scale Process Control by Driving Factor Identification," U.S. Patent No. 6904328, September 2001 (with E.A. Rietman).

4. "Scalable, Hierarchical Control for Complex Processes," U.S. Patent No. 6810291, September 2001, (with E.A. Rietman).

5. "Systems and Method for Lights-out Manufacturing," U.S. Patent Application No. 20060036345, August 2004 (with W. Chan and A. Cao).

6. "Filter Models for Dynamic Control of Complex Processes," U.S. Patent Application No. 20040039556, August 2003 (with W. Chan and A. Cao).

7. "Control of Complex Manufacturing Processes Using Continuous Process Data," U.S. Patent Application No. 20040019470, July 2002 (with W. Chan and A. Cao).

PRESENTATIONS AND PUBLISHED ABSTRACTS

1. "Dynamic Neural Controller™ as an E-diagnostic Tool," *Proceedings of the Asia AEC/APC Symposium IV*, November 2006 (with A. Cao, W. Chan, W. Martin, C. Beal, G. Boone, A. Wong, and D. Kelly).

2. "Beta Test Results for a Yield Optimizer," *Proceedings of the AEC/APC Symposium XVIII*, September 2006 (with A. Cao, W. Martin, P. Fearon, L. Krott, and A. Dries).

3. "A Neural Network-based Yield Optimizer for Semiconductor Manufacturing," *Proceedings of the AEC/APC Symposium XVII*, September 2005 (with A. Cao, W. Chan, W. Martin, C. Cuneo, and J. Hyde).

4. "Scalable Hierarchical Yield Control System for Semiconductor Manufacturing: A Feasibility Study," *Proceedings of the AEC/APC Symposium Asia, 2004* (with B. Martin, W. Chan, J. Hyde, Y. Lai, P. Fearon, and J. Doxsey).

5. "Relationship Between in-situ Information and ex-situ Metrology in Metal Etch Processes," *Proceedings of the AEC/APC Symposium Asia, 2004* (with A. Cao, W. Chan, W. Martin, and Y. Lai).

PRESENTATIONS AND PUBLISHED ABSTRACTS (CONTINUED)

6. "Target-oriented Operations of 300mm wafer production lines - necessities and hurdles of advanced process controls," *Proceedings of the ICRA*, September 2003.

7. "Dynamic Update Scheme for Real-Time Adaptive Process Modeling," *Proceedings of the AEC/APC Symposium XV*, September 2003 (with A. Cao, W. Chan, W. Martin, and J. Hyde).

8. "Advanced Analysis of Dynamic Neural Control Advisories for Process Optimization and Parts Maintenance," *Proceedings of the AEC/APC Symposium XIV*, September 2002 (with W. Chan, W. Martin, and J. Morgan).

9. "Dynamic Neural Controller: Test Results for LAM Plasma Etch Applications," *Proceedings of the XII SEMATECH AEC/APC Symposium*, September 2001 (with W. Chan, M. Ellis, W. Martin, E. Rietman, and P. Walker).

10. "Optimizing a Plasma Etch Process with a Neural Network-Based Model Predictive Controller", Proceedings of the VIII SEMATECH AEC/APC Workshop, September 1996.

PEER REVIEWER

- IEEE Transactions on Manufacturing Engineering
- SAE International
- DynaMed

PROFESSIONAL AFFILIATION

- IEEE
- IEEE Computational Intelligence Society
- IEEE Engineering in Medicine and Biology Society
- American Statistical Association
- Cornell University Alumni Association