JOHN C. ALDRIN

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Education

Northwestern University, *Evanston, IL* 60208
Theoretical and Applied Mechanics, Doctor of Philosophy, February 2001 GPA: 3.9/4.0
Dissertation: Models and Classification Procedures for Ultrasonic Inspection of Holes for Fatigue Cracks (Prof. J. D. Achenbach - Major Professor)

Purdue University, *West Lafayette, IN* 47907
Mechanical Engineering, Master of Science, May 1996 GPA: 3.8/4.0
Thesis: Investigation of Vibration Control Systems Applied to an Automatic Washer Suspension Design (Prof. W. Soedel - Major Professor)

Purdue University, *West Lafayette, IN* 47907
Mechanical Engineering, Bachelor of Science, May 1994, With Distinction GPA: 3.8/4.0
Undergraduate Research Project: Dynamic Analysis of a Historical Ballistic Mechanism

Graduate Level Coursework - Mechanics:
Mechanical Vibration, Advanced Dynamics, Fundamentals of Fluid Dynamics (1), Engineering Acoustics, Advanced Engineering Acoustics, Theory of Elasticity II (Contact Mechanics), Vibration of Continuous Systems, Wave Propagation in Elastic Solids.

Graduate Level Coursework - Mathematical Modeling and Computation:
Complex Analysis, Differential Equations in Mathematical Physics (2,3), Nonlinear Engineering, Asymptotic and Perturbation Methods (1,2), Numerical Methods in Mechanical Engineering, Finite and Boundary Element Methods, Optimal Design.

Graduate Level Coursework - Experimentation and Control:
Statistics, Advanced Digital Signal Processing, Nondestructive Testing, Theory and Design of Control Systems, Microprocessors in Electromechanical Systems.

Experience

Computational Tools, *Gurnee, IL 60031*
Engineering Consultant, February 2001 to present
- Lead AFOSR task to develop and implement strategy for computational methods in nondestructive evaluation in support of the direction of AFRL/MLLP.
- Support SAIC Ultra Image Int. to develop automated inspections for C-141 rib clip holes and C-130 beam cap holes through modeling, signal classification and interface development.

Northwestern University, Center for Quality Engineering, *Evanston, IL* 60208
Graduate Research Assistant, January 1998 – February 2001
- Developed a simulation of the scattering of an ultrasonic transducer signal by a C-141 weep hole (cylidrical cavity) with a surface breaking crack using the boundary element method.
- Developed algorithm using neural networks for detection of bottom and top cracks in weep holes.
- Designed and implemented PC software (operator interface in VB, analysis in DVF) that interfaces with the Ultra Image IV system for automated ultrasonic inspection of weep holes.
- Developed models and ultrasonic inspection procedures for special holes cases: fluid filled cavity, cavity with elastic insert with stiffness interface, cavity with elastic coating.

Whirlpool Corporation, *Benton Harbor, MI* 49022
Project Engineer, May 1996 - December 1997
St. Joseph Technical Center - Advanced Laundry Development, May 1997 - December 1997
- Successfully led Catalyst wash system sub-team through Concept Selection Milestone.

Corporate Technology Development - Fabric Care Advanced Development, May 1996-April 1997
- Developed and implemented cost effective automatic washer spin dynamics test platform.
- Performed fundamental experimental studies on automatic washer suspension performance.
- Developed strategy and performed investigations for the application of sensors to washers.

Purdue University, Herrick Laboratories, *West Lafayette, IN* 47907
Graduate Research Assistant, January 1995 - May 1996

- Performed review of the state-of-the-art in vibration control systems.
- Developed analysis methodology and performed assessment of the most promising vibration control systems for application to automatic washer suspension design.
- Performed analytical investigations of adaptive passive automatic washer suspension concepts.

Whirlpool Corporation, *Benton Harbor, MI* 49022
Engineer, May 1994 - December 1994
Corporate Technology Development - Fabric Care Advanced Development

- Assessed performance of washer suspension using dynamic models developed with ADAMS.
- Performed designed experiments on prototype automatic washer suspension design.
- Performed modal analysis for prototype automatic washer tub structure using LMS.

Whirlpool Corporation, *Benton Harbor, MI* 49022
Engineering Co-op, May 1990 - April 1993

- Experimentally analyzed dynamic forces of an automatic washer suspension structure.
- Performed extensive work in modal analysis and operational deflection shapes of structures.
- Conducted sound quality survey of automatic washers.
- Evaluated CFC recovery processes for refrigerator systems.
- Performed experimental investigations of energy use, air flow and temperature in dryers.
- Designed software program which processed spectrophotometer data.

Training and Skills

- *Technical seminars*: Elementary ADAMS, Active Vibration Control, Sensor Basics, Sensor Signal Conditioning, Introduction into Taguchi Techniques, Design of Experiments for Discovery, Improvement and Robustness.
- *Software experience*: MS Office, MS Access, MS Project, Lotus Notes, LabVIEW LMS, ANSYS, ADAMS, Matlab and Simulink, Minitab.
- *Program languages*: Fortran (UNIX, DVF), Visual Basic, C/C++, Pascal, Assembly, PLC.
- *Laboratory skills*: Buildup of mechanical and electrical aspects of prototypes, Setup of data acquisition and control systems
- *Management seminars*: Precision Management, Working in Teams
- *Foreign languages and culture*: Introductory language training in Italian and French

Publications and Patents

Aldrin, J., Achenbach, J. D., Andrew, G., P'an, C., Grills, B., Mullis, R. T., Spencer, F. W., Golis, M., "Case Study for the Implementation of an Automated Ultrasonic Technique to Detect Fatigue Cracks in Aircraft Weep Holes", *Materials Evaluation*, (to be published.)

Aldrin, J., Achenbach, J. D., "Refined Detection of Cracks in Weep Holes Using Spatial Signal Variation", *Review of Progress in QNDE*, (to be published.)

Aldrin J., Cheng, A., Achenbach, J. D., Andrew, G., Mullis, R.T., "Detection of Cracks in Weep Holes Using Neural Networks", *Review of Progress in QNDE*, Vol. 19, 2000.

Whah, K., Aldrin, J., Pinkowski, R., Euler, J., "Control for an Automatic Washer with Spray Pretreatment", *Submitted 1999 - US Patent Pending*.

Aldrin, J., Conrad, D. and Soedel, W., "Investigation of Passive and Adaptive Passive Dynamic Absorbers Applied to an Automatic Washer Suspension Design", Smart Structures and Materials 1996: Passive Damping and Isolation, *Proc SPIE Int Soc Opt Eng*, Vol. 2720, 1996.

Affiliations and Activities

President - Mechanics Club - Northwestern University (1999-2000 acedemic year)
Computer Consultant (UNIX, PC) - Center for Quality Engineering (Prof. Achenbach) - (1999-2001)
Mentor - Undergraduate research project summer intern - Summer 1998
Engineer in Training - National Society of Professional Engineers
Member - The American Society of Nondestructive Testing (ASNT)
Member - The Instititute of Electrical and Electronics Engineers (IEEE)