



1019 Airpark Drive
Sugar Grove, Illinois 60554
Phone: 630-556-9700
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Web: www.itcexperts.com

Mark Fleming, Ph.D., P.E. **Director of Mechanical Engineering**

PROFESSIONAL EXPERIENCE

2011-Present ITC Experts – Sugar Grove, Illinois

Responsible for consultation in the areas of failure analysis, accident investigation and reconstruction, design review and evaluation, and machinery and product testing. Specific areas of expertise include mechanical design analysis with finite element analysis. Manage projects in a broad range of products, equipment and structures.

2003-2011 PACKER ENGINEERING - Naperville, Illinois
Senior Director, Mechanical Engineering

Performed accident investigation and reconstruction, product design review and evaluation, and machinery and product testing. Utilized finite element analysis for mechanical design evaluation and vehicle crashworthiness analysis.

1997-2003 CNH Global/Case Corporation - Burr Ridge, Illinois
Principal Engineer

2001-2003 Advanced Engineering Analysis
Developed and deployed advanced simulation technologies for the optimization of agricultural and construction machinery. Specialized in vehicle dynamic shake simulations, particle flow methods, and optimization methods. Wrote methodology and “best practices” documents, taught analysis seminars, and coordinated software acquisition and usage.

2000-2001 Manager, Manufacturing Simulations
Responsible for a corporate-wide analysis team for manufacturing simulations ranging from manufacturing process simulations to factory layout and factory flow simulations. Worked with 20 factories worldwide providing analysis and solutions related to the manufacture of agricultural and construction equipment products.

1997-2000 Engineering Analysis
Specialized in the analysis of rollover protective structures (ROPS) and topology optimization. Introduced a new technology to the design teams such as topology optimization, manufacturing process simulation, and reliability-based design



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analysis. Coordinated analysis activity for three product lines, including planning, budgeting, and holding analysis reviews.

ACADEMIC

- Ph.D. Northwestern University, Evanston, Illinois - Theoretical and Applied Mechanics (1997)
- M.S. Northwestern University, Evanston, Illinois - Theoretical and Applied Mechanics (1994)
- B.S. University of Nebraska, Lincoln, Nebraska - Mechanical Engineering (1992)

CONTINUING EDUCATION

- Reliability assessment for welded structures (1999)
- Probabilistic Analysis and Design: Computational Methods and Applications (1999)
- Operations research (2000)
- Logistics (2000)
- Fatigue design analysis with MSC.Fatigue (2001)
- Fatigue data analysis using nCode (2003)
- Vehicle Accident Reconstruction Methods (2005)
- HVE Introductory Training (2005)
- Fundamentals of Automotive Fuel Delivery Systems (2007)
- Vehicle Dynamics for Passenger Cars and Light Trucks (2009)

SPECIALIZED COMPUTER EXPERTISE

- Finite element software: ABAQUS/Standard and Explicit, Optistruct, Hypermesh, LS-Dyna,
- CAD/CAM software: Pro/Engineer, AutoCAD, Solidworks
- Manufacturing software: Promodel, VisFactory
- Programming Languages: Fortran, Matlab
- Accident reconstruction software: EDCrash, EDSMAC, Simon

PROFESSIONAL REGISTRATIONS AND MEMBERSHIPS

REGISTRATION

Licensed Professional Engineer in Illinois (License No. 62057502)



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MEMBERSHIPS

American Society of Mechanical Engineers (ASME)
Society of Automotive Engineers (SAE)
ASM International
United States Association for Computational Mechanics
Pi Tau Sigma, Tau Beta Pi (engineering honor societies)

PUBLICATIONS AND PRESENTATIONS

PUBLICATIONS

1. "Fatigue Reliability Method with In-Service Inspections, M.S. Thesis (1994).
2. Belytschko T., Krongauz, Y., Fleming, M., Organ, D.J., and Liu, W.K., "Smoothing and Accelerated Computations in the Element-Free Galerkin Method," Journal of Computational and Applied Mathematics, 74:111-126 (1996).
3. Belytschko, T., Krongauz, Y., Organ, D., Fleming, M., and Krysl, P., "Meshless Methods: An Overview and Recent Developments," Computer Methods in Applied Mechanics and Engineering, 139:3-47 (1996).
4. Organ, D., Fleming, M., Terry, T., and Belytschko, T., "Continuous Meshless Approximations for Nonconvex Bodies by Diffraction and Transparency," Computational Mechanics, Volume 18, Number 3, 225-235 (1996).
5. "Meshless Methods of Fatigue Crack Propagation," PhD Thesis (1997)
6. Fleming, M., Chu, Y., Moran, B., and Belytschko, T., "Enriched Element-Free Galerkin Methods for Crack Tip Fields," International Journal for Numerical Methods in Engineering, 40:1483-1504 (1997).
7. Belytschko, T. and Fleming, M., "Smoothing, Enrichment and Contact in the Element-Free Galerkin Method," Computers and Structures, 71(2):173-195 (1999).
8. Roy, S. and Fleming, M., "Non-Linear Subgrid Embedded Element-Free Galerkin Method for Monotone CFD Solutions," Proceedings of the 3rd ASME/JSME FED Conference (1999).
9. Yi, T. and Fleming, M., "Dynamic Simulations for Self-Propelled Sprayer With a Large Flexible Boom," LMS Conference for Physical and Virtual Prototyping (2002).



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PRESENTATIONS

1. "Design and Analysis for Optimizing Manufacturing Processes," Design Engineering Conference at National Manufacturing Week (March 18-21, 2002).
2. "Manufacturing Simulations," Northwestern University (October 2000).
3. "Elemento Finitos Sin Malla," Universidad Politecnica de Madrid, Madrid, Spain (December 1996).
4. "The Element-Free Galerkin Method for Fatigue Crack Propagation," University of Nebraska, Lincoln, Nebraska (April 1996).
5. "There is a Substitute – Engineering Perspective on the Use of Computer Simulations," ACMIE SLG Workshop, DRI, Las Vegas, NV (February 2006).
6. "The Good, the Bad, and the Ugly – Computer Simulations for Product Development, Failure Analysis, and Mischief," Material Science and Technology 2006 Conference and Exhibition, Cincinnati, OH (October 2006).
7. "Finite Element Analysis in Products Litigation: What you See is Nice, What's Covered is Vital," E.M. Caulfield, M. Fleming, and K. Schiferl, ABA 2008 Emerging Issues in Motor Vehicle Product Liability Litigation, Phoenix, AZ (April 2008).
8. "A New Approach to an Old Topic – Using Finite Element Analysis to Analyze Spot Weld Claims in Crashworthiness Cases," M. Fleming and A. Jones, ABA 2009 Emerging Issues in Vehicle Product Liability Litigation, Phoenix, AZ (April 2009).