

Professional Resume

Employee Name

Research Engineer

Specialization

Dynamic response of structures to penetration and explosive loads; geo-material modeling; applied mechanics; structural dynamics; dynamic buckling; finite element analysis

Education

B.S. (with highest honors) in aerospace engineering, North Carolina State University, (1994)

M.S. in mechanical engineering, Stanford University, (1995)

Graduate Studies in mechanical engineering, Stanford University, (1998-2002)

Experience

2003-date Research Engineer ARA, Inc. Mountain View, CA

Leading and performing research projects related to the dynamic response of structures to impact and explosive load.

- Implementation geo-material models in structural response calculations.
- Development connection models for World Trade Center progressive collapse analysis.
- Development simulation based design system to rapidly evaluate the vulnerability of vehicle designs to a mine or above ground bomb.
- Created routines to transform structural database information into finite element models for the World Trade Center impact analysis.
- Conducted analyses and development of traffic barriers, design and evaluation of roadside hardware, analysis of vehicle response and motions from impacts with roadside structures.

1997-2003 Research Engineer SRI International Menlo Park, CA

Led and performed research projects on the response of materials and structures under impact, explosion, and other dynamic conditions. Wrote or contributed to several reports, proposals, and project and proposal budgets.

- Developed rules and tools for design and structural analysis of powered composite plates. Identified industry application for powered composite technology and worked with client to develop product.

- Lead experimental and computational program to develop physics based methodology for analyzing fatigue crack initiation and growth.
- Conducted a program to develop a landmine neutralization system. Unique design of system led to award of a patent.
- Guided a task to determine the damage and enhanced penetrability of reinforced-concrete burster slabs with 1/12-scale tests. Developed a large and comprehensive data set frequently used by the client.
- Directed a large experimental program investigating dynamic response of concrete structures from aircraft impact.
- Developed experimental program to investigate deflagration and deflagration-to-detonation in hydrogen/air systems. Took the lead in computational assessment of industrial damage from hydrogen/air detonation. Program led to high degree of client satisfaction that resulted in a five-year contract extension.
- Revitalized SRI metallography lab to perform analysis of failed ball mill mine gear. Analysis of failure lead to settlement of insurance claim.

1995-1997 Application Engineer Prescient Technologies Pleasanton, CA
Developed and implemented knowledge-base-driven computer assisted design (CAD) programs.

1991-1994 Co-operative Education Intern Eglin AFB Eglin, FL
Performed finite element and finite difference concrete penetration calculations and weapon system kill assessments.

Affiliations

American Institute of Aeronautics and Astronautics
American Society of Mechanical Engineers

Selected Publications

Peterson B. D., S. W. Kirkpatrick, R. T. Bocchieri, "Advances in Finite Element Simulation of Blast Response to Structures", 48th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Honolulu, Hawaii, 23-26 April, 2007.

S.W. Kirkpatrick, B.D. Peterson, and R.A. MacNeill, "Finite Element Analysis of Train Derailments," ICrash2006. Proceedings of the International Crashworthiness Conference, July 4-7, 2006, Athens, Greece.

S.W. Kirkpatrick, R.T. Bocchieri, R.A. MacNeill, B.D. Peterson, and F. Sadek, "Modeling Methodologies for Assessment of Aircraft Impact Damage to the World Trade Center Towers," 9th International LS-DYNA Users Conference, Dearborn MI, USA, June 4-6, 2006.

S.W. Kirkpatrick, B.D. Peterson, R.C. Goetz, and R.A. MacNeill, "Simulation-Based Design for Vehicles Exposed to Blast and Fragment Threats," Presented at the 17th Annual Ground Vehicle Survivability Symposium (GVSS), Redondo Beach, CA, March 28-30, 2006.

Bocchieri, R.T, B. D. Peterson, S. W. Kirkpatrick, R.C. Goetz, "IED Fragment/Airblast Threat Module for the Simulation-Based Design System," Presented at the 17th Annual Ground Vehicle Survivability Symposium (GVSS), Redondo Beach, CA, March 28-30, 2006.

Brian D. Peterson, R. Goetz, S. Kirkpatrick, S. Holmes, "Simulation-Based Design for Vehicles Exposed to Mine Threats," 16th Annual U.S. Army Ground Vehicle Survivability Symposium, April 2005, Monterey, CA.

Mark A. Groethe, Brian D. Peterson, Seiki Chiba, and James D. Colton, "Experimental Facilities for Hydrogen Deflagration Safety Studies," 11th Canadian Hydrogen Conference, 17-20 June 2001, Victoria, BC Canada

B. D. Peterson, E. L. Jerome, J. K. Gran, "A Small-Scale Experimental Study of the Penetrability of Explosively Damaged Reinforced Concrete Slabs," 10th International Symposium on the Interaction of the Effects of Munitions with Structures, 7-11 May 2001, San Diego, CA.

Haruji Tsubota, Norihide Koshikia, Jun Mizuno, Mohsen Sanai, Brian Peterson, Hideaki Saito and Akira Imamura, "Scale Model Tests of Multiple Barriers against Aircraft Impact: Part 1. Experimental Program and Test Results," Transactions of the 15th International Conference on Structural Mechanics in Reactor Technology (SmiRT-15), 15-20 August, 1999, Seoul, Korea

Technical Reports:

Peterson, B. D., Bocchieri R. T., S. W. Kirkpatrick, "Simulation-Based Design of Ground Vehicles Exposed to Mine and Blast Threats: Sub-modeling of a Seating System," ARA Technical Report, Project 17765, U.S. Army TACOM Contract Number, W56HZV-06-C-L534. September 2007.

Peterson, B. D., Kirkpatrick, S. W., R. T. Bocchieri, R. A. MacNeill, "Simulation-Based Design for Armored Vehicles Exposed to Mine and IED Threats," ARA Technical Report, Project 17138, U.S. Army TACOM Contract Number, W56HZV-06-C-L534. June 2007.

Kirkpatrick, S. W., R. T. Bocchieri, F. Sadek, R. A. MacNeill, S. Holmes, B. D. Peterson, R. W. Cilke, C. Navarro, "Federal Building and Fire Safety Investigation of the World Trade Center Disaster: Analysis of Aircraft Impacts into the World Trade Center Towers, NIST NCSTAR 1-2B. National Institute of Standards and Technology, Gaithersburg, MD, September, 2005.

Professional Bio

Brian D Peterson

While working on his undergraduate, Mr. Peterson worked as a cooperative education student at Eglin Airforce Base. It was during his time at Eglin that he performed finite element and finite difference concrete penetration calculations and weapon system kill assessments and grew to love analyzing the deformation and failure of materials and structures. After graduation from North Carolina State University with a B.S. in Aerospace Engineering, Mr. Peterson left the East Coast for California. He graduated with his M.S. in Mechanical Engineering from Stanford University and joined Prescient Technologies, Inc. While at Prescient he developed and implemented knowledge-base-driven computer assisted design (CAD) programs for several aerospace clients.

In 1997 Mr. Peterson joined SRI International's Poulter Laboratory where he led and performed research projects on the response of materials and structures under impact, explosion, and other dynamic conditions. Mr. Peterson has studied fatigue cracking of nickel super-alloys; dynamic response of structures to penetration and explosive loads; dynamic buckling; assessment of industrial hazards; energy system analyses and syntheses.

In 2003 Mr. Peterson joined the ARA Silicon Valley Office, where he applies his expertise to finite element problems.

- Clearance Level: Secret
- Computer Languages: C, FORTRAN, Visual Basic, Mathematica
- Patents: Explosive Device Neutralization System (US 6,298,763 B1)
- Capability-based experience: Applied Mechanics, Fatigue cracking of nickel alloys; dynamic response of structures to penetration and explosive loads; dynamic buckling; finite element analysis (LS-DYNA, DYNA3D, NIKE); assessment of industrial hazards; energy system analyses and syntheses; experimental instrumentation including strain, temperature, and pressure measurement