

**Khosrow “Nema” Nematollahi**  
**Associate Faculty of Mechanical Engineering**

**Education**

- May, 1983, Ph.D., Civil Engineering, Purdue University.
- May, 1980, M.S.C.E., Purdue University, West Lafayette.
- January 1977, French Language Certificate, Paris University.
- November, 1978 Graduate Research Program, Paris University.
- 1976, B.S.C.E., Civil Engineering, Aryamehr University.

**Position Held at IUPUI**

July 1997 – Present, Associate Faculty, Department of Mechanical Engineering.

**Current Research: Senior Modeling and Simulation specialist (4/2005 – Present)**

Currently research program is on a large US government project. As modeling and Simulation specialist, we are developing anti-ballistic composite structures. Building simulation models for structural, mechanical, thermal, vibration, shock, bullet penetration, fragment impact due to explosion, fire burn, oven cook off, and drop test simulations.

**Other Related Experience**

- Aug. 1980 – May 1983, Teaching of Engineering Graphics at Purdue University.
- January. 2003 – Associate Faculty of Construction Engineering Technology.
- 1998-January 2000 – Have regularly attended and contributed to one of the big three automotive company's Supplier Competency Team meetings for the CAD/CAM/CAE/PDM global integration and training programs.
- 1999, Designed the Global Online computer aided engineering assessment tools for one of the big three.
- 1988-2000, Taught various Computer-Aided Engineering, Applied Finite Element and Design courses at automotive and aerospace companies (CAE/CAD).

**Consulting, Patents, etc.**

- 1984- Present, Own the copyrights to the Inertia Engineering and Finite Element System.
- 1996-1997, Completed a large product development project using Simulation Based Design to develop energy absorbent instrument panel, seat belts and seats for a popular Sports Utility Vehicle (SUV).
- 1997-1998, Designed a process development project to implement enterprise wide Information Technology System and Business Process Reengineering (BPR) for a City County Government agency.

**State(s) in which Registered**

Engineer Trainee, State of Indiana, passed the FE exam, 1983.

**Teaching Interests**

Mechanical behavior of materials; design; dynamics; vibrations; finite element method, visualization and Simulation.

**ME Courses Taught**

*ME 450 Computer-Aided Engineering Analysis.*

**Research Interests**

1. Building a Global Online Immersive Visualization, Simulation and Collaboration for teaching and learning.
2. Immersive Stereo Visual Collaboration.
3. Transfer mechanical engineering technologies to life sciences.
4. Anti-ballistic composite structures.
5. Advanced materials; computational mechanics; fatigue and fracture; biological composites; biomedical engineering.
6. Anti-Blastic , Anti-flame and anti-shock composite structures.

**Membership in Scientific and Professional Societies**

American Society of Civil Engineering (ASCE).

**Industrial Executive Responsibilities**

1. Senior Modeling and Simulation specialist for the US NAVY at EG&G Technical Services.
1. January 2002 - Present, Chairman, CAE-net.com, Inc.
2. 1999 - 2002, Principal, Global Professional Services, Silicon Graphics, Inc. (SGI is the global leader in high performance super computing and visualization).
3. 1984 - 1999, Chairman and CEO, MCAE, Inc., Indianapolis, IN (1984 - 1999) (A Computer Aided Engineering Software and Services Company).

**Significant Professional Service**

1. 1984-present, extensive engineering consulting services experience in automotive, aerospace, electronics, computers and general manufacturing projects in solid mechanics, thermal Science and electronic packaging.
2. 1984-Present, Other areas of significant contribution - Structural Design and Analysis, Finite Element Theory and Application, Design Optimization, Object-Oriented Development System and Large Scale Software System Design.
3. 2001-2002, architected The Global University while participating in a distance Education project at a state university in Ohio. Has experience in all five segments of the Global University (Super Network, Media Delivery, Classroom

Immersive Stereo Visual collaboration, Course Management and Content Creation).

### **Significant Professional Development Activities**

Numerous Leadership, Visualization, Simulation, Media and High performance computing seminars.

### **Principal Publications**

#### Published Technical Products

- 1- K. Nematollahi, Asad Kamel, 1987 “Structural modeling and analysis program for Civil Frame structures such as bridges, high-rises and other 3-D space structure (InFrame)”, INERTIA Manuals 1985-1997.
- 2- K. Nematollahi, Asad Kamel and Xianjie Zhang, 1988. Structural modeling and analysis for Civil solid structures such as concrete foundations and slabs (InSolid), INERTIA Manuals 1985-1997.
- 3- K. Nematollahi, 1986 “ a computer program to compute engineering properties of uncommon shapes (Inprop)”, INERTIA Manuals 1985-1997.
- 4- K. Nematollahi, Mohsen Azimi, Omid Karimi, 1994 “ A comprehensive design and surface modeling program. This program has implemented the Non-Uniform Rational B-Spline ( NURBS) technology in finite element applications (InConcept). This program is a parametric feature based curve surface modeling specifically design for engineering analysis”, INERTIA Manuals 1985-1997.
- 5- K. Nematollahi, Mohsen Azimi, Jeff Casselman, 1990 “ A transient and steady state heat transfer program which is modular but integrated to the mechanical stress analysis packages from the INERTIA Engineering System (InThermal)”, INERTIA Manuals 1985-1997.
- 6- K. Nematollahi, Xianjie Zhang and Mohsen Azimi, 1992 “ a structural Vibration program which extracts natural frequencies by solving eigen value problems. It also animates their respective mode shapes (InDynamics), INERTIA Manuals 1985-1997.
- 7- K. Nematollahi, V. Venkataraman and Mohsen Azimi, 1989 “ A mechanical simulation program for assembly, kinematics, dynamics and static modeling and analysis of complete mechanical systems (InMotion), INERTIA Manuals 1985-1997.
- 8- K. Nematollahi, Mohsen Azimi and Xianjie Zhang, 1993 (A Computer simulation program for Non-linear analysis of structural systems (InPlastic)”. InPlastic uses a proprietary technology that reduces user interaction and improves accuracy. Adaptive load correction technology and automatic load step iteration incrementation are major new technologies in this program, INERTIA Manuals 1985-1997.

## **Some of Major Industrial Research and Development projects.**

- 1: K. Nematollahi, Darin Cleavelan, Tom Chance: Energy Absorbent Instrument Panel for Jeep Grand Cherokee. Chrysler Corporaton 1996, 1997, 1998.
- 2: K. Nematollahi : Energy Absorbent seat recliner system, P. L. Porter Automotive, 1997.
- 3- K. Nematollahi, Darin Cleaveland, Tom Chance: Steering Column support system for Textron Automotive Corporation, 1997.
- 4- K. Nematollahi, Darin Cleaveland, “ Exhaust System Design and Simulation”. Arvin North America 1996, 1997.
- 5: K. Nematollahi, Ren Zhang: Semi-Truck energy absorbent Bulk-Head for Aero Industries Inc. This research and development project satisfied Government safety requirements (1996).
- 6: K. Nematollahi : Airplane starter engine for Allied Signal Aerospace, Tempe Arizona (1996)
- 7: K. Nematollahi, Ren Zhang, Chet Brian: Scroll air conditioner compressor with Orbital Scroll and Fixed scroll for Ford Motor Company, 1995.
- 8: K. Nematollahi, Richard Branen: Cadillac Head light thermal simulation For Hughes Power Products (1995).
- 9: K. Nematollahi, Mohsen Azimi, Jeff Casselman : Steering Wheel crash Simulation Based Design for Jeep Grand Cherokee, Chrysler Corporation 1989.
- 10: K. Nematollahi, Asad Kamel : “ Design and simulation of a M60 Tanks 36 Wheeler trailer for the **US ARMY**”, 1988. This project was managed by Wabash National, Lafayette Indiana.

## **Published Technical Papers**

- 1: Khosrow Nematollahi : ‘ FEA Software Advances SPUR Use of Tool Directly by Design Engineers”. International Off-Highway & Power Plant Congress & Exposition, Milwaukee, Wisconsin September, 1994. SAE Technical Paper Series 941814, pages 1-3.
- 2: Khosrow Nematollahi, “ Wave Front Solvers Handle Large Models on PC FEA”. Machine Design, November 22, 1990, Page 94.
- 3: Albert D. Lewis, Khosrow Nematollahi, and David Gaskins: “Structural Tee X-Bracing Strength Studies” Journal of Structural Engineering, July 1987. Pages 1-27, Copyright 1981, Purdue Research Foundation.
- 4: Lewis, A. D. M. and Nematollahi K. “Numerical Analysis of Structural Tee X-Bracing,” Proceedings of the Eight Conference on Electronic Computations, ASCE, 1983, Pages 490-500.

- 5: Lewis, A. D. M. and Nematollahi K., " Lateral Load Capacity of Structural Tee X-bracing", Report No. CE-STR-81-28, School of Civil engineering, Purdue University, West Lafayette, Ind.. Copy right, Purdue Research Foundation 1981.
- 6: Khosrow Nematollahi ," GUIs Extend the Role of Engineering Analysis", Computer Graphics Review, May 1990, Pages 17-24.
- 7: Khosrow Nematollahi, Directeur General "Les applications d'ingenierie migrent vers les interfaces d'utilisateur graphiques", La Revue Polytechnique No. 1531, January 1991, Pages 27-31.
- 8: Khosrow Nematollahi, Ph.D., "Leading Trends in Engineering Analysis", Proceedings of the 5<sup>th</sup> CAE Center Conference, Allied Signal Aerospace, April 28, 1993, Page 1(Opening).

### **Reviewed and Edited Technical papers in Cooperation With**

- 1: Phil Vogt, Victor Johnson, Chrysler Corporation "PC-Based Finite Element Analysis Cuts Time to Design Jeep Strap" Body Engineering Journal, Spring 1995, Pages 30-32.
- 2: Phil Vogt and Victor Johnson, Chrysler Corporation, " Chrysler Engineers Use PC-Based FEA to Solve Design Challenge", CAD Systems, February 1995, Pages 10-11.
- 3: Dave Kinnison, Chief Design Engineer, AutoJectors Corporation, " When prototyping is Too Expensive and Impractical", CADENCE, July 1991, Pages 71-72.
- 4: David Nelson, Ford Motor Company, " FEA at Ford " Reducing the weight of SAE pressure aluminum alternator housing for the Ford Taurus, CADENCE, August 1990, Pages 77-78
- 5: David Angelotti, Dow Corning Corporation, " Review INERTIA", CE COMPUTING REVIEW, ASCE's Newsletter on Computing in Civil Engineering, March 1990 Volume2, Number 3, Pages 1-8.