

**GUSTAV A. NYSTROM, Ph.D., P.E.**

**Telephone: (925) 829-9554**

### **Specialties**

Reconstruction of vehicular and industrial accidents  
Analysis of vehicle collisions and vehicle response to operator input  
Tire research and design  
Dynamics, impact, and vibration  
Soil mechanics and foundation engineering  
Finite element and finite difference analysis of solids and fluids  
Design optimization and numerical analysis

### **Education**

Ph.D. Applied Mechanics with a minor in Computer Science, Stanford University, 1975  
M.S. Applied Mechanics, Stanford University, 1973  
B.S. Aeronautical Engineering, with highest honors, University of Illinois, 1970

### **Experience**

Amador Newtonian Engineering (1994- ) Principal Engineer  
Modeling and Computing Services (1992-1994) Senior Mechanical Engineer, Design Optimization  
Failure Analysis Associates (1989-1992) Senior Engineer, Accident Reconstruction  
PEDA Corporation (1986-1989) Staff Scientist, Computational Fluid Dynamics  
Exxon Production Research (1977-1986) Senior Researcher, Offshore Structure Foundations  
Uniroyal Research Center (1976-1977) Research Engineer, Tire Mechanics  
Lockheed Missiles and Space (1970-1973) Engineer, Structural Dynamics

### **Affiliations**

Registered Professional Mechanical Engineer, California #M-27482  
Licensed Brake Inspector, California #JC150968  
Member: American Society of Mechanical Engineers  
Society of Automotive Engineers (SAE)  
SAE Accident Investigation / Reconstruction Practices Committee  
the Society of Forensic Engineers and Scientists  
Sigma Xi (scientific research society)  
the Tire Society  
Rubber Division, American Chemical Society (ACS)  
Former chapter president, Sigma Tau (honorary engineering society)

### **Other**

Fluent speaker of Spanish  
Distinguished Alumnus Award, University of Illinois Dep. of Aeronautical Engineering, 1996

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**PUBLICATIONS LIST**

**Vehicles**

- "Stiffness Parameters for Vehicle Collision Analysis, an Update" Paper #2001-01-0502, Society of Automotive Engineers, March 2001. \*\*\*
- "Application of the NHTSA Crash Database to Pole Impact Predictions," Paper #920605, Society of Automotive Engineers, February 1992 (with G. Kost).
- "Stiffness Parameters for Vehicle Collision Analysis," Paper #910119, Society of Automotive Engineers, February 1991 (with G. Kost and S. M. Werner). \*\*\*
- "A Two-Dimensional Model of a 'Falling' Vehicle," Paper #910124, Society of Automotive Engineers, February 1991 (with G. Kost et al.).
- "Dynamics of Aero-Driven Bodies with Collisions and Sliding Contact," Paper #AIAA-91-2938, American Institute of Aeronautics and Astronautics, Flight Simulation Technologies Conference, August 1991 (with D. T. Wang and C. K. Lombard).
- "Combined Use of Upper Bound Theorems and Available Lower Bound Information," 20th Structures, Structural Dynamics, and Materials Conference, American Institute of Aeronautics and Astronautics, Paper #79-0785, April 1979.
- "Structural Analysis and Design for Energy Absorption in Impact," Prepared for the U.S. Department of Transportation, Report #DOT-TST-76-44, Stanford University, December 1975 (with E. H. Lee and R. L. Mallett).
- "Combined Bounds Analysis of the Deformation of Plastic Structures Under Impact," Ph.D. dissertation, Stanford University, Department of Applied Mechanics, December 1975.
- "Methods of Estimating Impact Duration and Final Deformation on Collisions," SUDAM Report 75-3, Stanford University, March 1975 (with T. C. T. Ting et al.).

**Design**

- "A New Three-Step Move Limit Strategy for Non-Hierarchic Multidisciplinary System Optimization", Paper #AIAA-94-4331, American Institute of Aeronautics and Astronautics, 5th Multidisciplinary Optimization Symposium, September 1994 (with E. D. Eason et al.).
- "Non-Hierarchic Multidisciplinary Design of a Commercial Aircraft", Paper #AIAA-94-4302, American Institute of Aeronautics and Astronautics, 5th Multidisciplinary Optimization Symposium, September 1994 (with E. D. Eason et al.).
- "Robustness Testing of Non-Hierarchic System Optimization Software", Paper #AIAA-94-4335, American Institute of Aeronautics and Astronautics, 5th Multidisciplinary Optimization Symposium, September 1994 (with E. D. Eason et al.).

## **Fluids**

- "Complex Wedge Cavity Solutions Using a Multi-Grid Multi-Patch Approach," 25th Joint Propulsion Conference, American Institute of Aeronautics and Astronautics, Paper #AIAA 89-2672, July 1989 (with C. K. Lombard).
- "Simulation of 3-D Jet-Interaction Flowfields with CSCM on Multiple Grids," 25th Joint Propulsion Conference, American Institute of Aeronautics and Astronautics, Paper #AIAA-89-2552, July 1989 (with S. K. Hong et al.).
- "Asynchronous Concurrent Implicit CFD Algorithms," 4th Conference on Hypercubes, Concurrent Computers, and Applications, March 1989 (with C. K. Lombard et al.).
- "Application of the CSCM Method to the Design of Wedge Cavities," 19th Fluid Dynamics, Plasma Dynamics, and Lasers Conference, American Institute of Aeronautics and Astronautics, Paper #AIAA-87-1317, June 1987 (with E. Venkatapathy et al.).
- "CSCM Methodology for Slot Injection Cooled Cavity Flow Design in a High Enthalpic Stream," 25th Aerospace Sciences Meeting, American Institute of Aeronautics and Astronautics, Paper #AIAA-87-0518, January 1987 (with J. Bardina et al.).

## **Soils**

- "Effect of Lateral Soil Movement on Subsequent Axial Pile Capacity: A Finite-Strain Analysis," 6th International Offshore Mechanics and Arctic Engineering Symposium, March 1987.
- "Finite-Strain Axial Analysis of Piles in Clay," invited paper, Analysis and Design of Pile Foundation Symposium, American Society of Civil Engineers, October 1984.
- "The Use of Soil Mechanics Capabilities in a General Purpose Finite Element Program," Sedimentation Consolidation Models - Prediction and Validation Symposium, American Society of Civil Engineers, October 1984.
- "Sedimentation/Consolidation Models: Theory, General Report #2," Sedimentation Consolidation Models - Prediction and Validation Symposium, American Society of Civil Engineers, October 1984.
- "Long-Term Settlement of a Spudcan in Soft Clay: Field Tests and Boundary Value Analyses," International Conference on Constitutive Laws for Engineering Materials, January 1983.
- "The Analysis of Subsidence Associated with Geothermal Development," National Science Foundation, Research Applied to National Needs, Systems Control Inc., 3 Volumes, Report #5139, September 1976 (with R. W. Atherton et al.).
- \*\*\* Paper specially honored by the Society of Automotive Engineers by publication in the SAE Transactions. It was judged to be among the most outstanding technical research papers published during the year.