

GEOFFREY R. SHIFLETT

Address

Department of Aerospace and Mechanical Engineering
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Education

Ph.D., Mechanical Engineering, University of California, Berkeley, June 1978
M.S., Mechanical Engineering, University of California, Berkeley, June 1974
B.S., Engineering and Applied Science, Yale University, New Haven, Connecticut, June 1973

Research Interests

Kinematics and dynamics of machines. Simulation of dynamic systems. Computer-aided design.
Microelectromechanical devices and systems. Computer-aided education.

Professional Experience

9/1985-Present: Associate Professor, Department of Aerospace and Mechanical Engineering, University of Southern California, Los Angeles, California
9/1979-9/1985: Assistant Professor, Department of Mechanical Engineering, University of Southern California, Los Angeles, California
6/1978-6/1979: Project Engineer, Cal Recovery Systems, Richmond, California
9/1973-6/1978: Research and teaching assistant, Department of Mechanical Engineering, University of California, Berkeley, California

Honors

School of Engineering Distinguished Service Award, University of Southern California, 1985.
Outstanding Teaching Award, 1st Annual USC School of Engineering Teaching Awards, 1995.
Outstanding Teaching Award, 2nd Annual USC School of Engineering Teaching Awards, 1996.
School of Engineering TRW Excellence in Teaching Award, 1997.

Society Memberships

American Society of Mechanical Engineers (ASME)
International Federation for the Theory of Machines and Mechanisms (IFFToMM)
Society of Automotive Engineers (SAE)

Refereed publications

1. G.R. Shiflett and G. Trezek, 1979, "Parameters Governing Refuse Comminution," *Resource Recovery and Conservation*, 4(1), pp. 31-42.
2. G.R. Shiflett and G. Trezek, 1979, "The Use of Residence Time and Non-linear Optimization in Predicting the Comminution Parameters in the Swing Hammermilling of Residential Refuse," *Ind. & Eng. Chem. Process Design and Development*, 18(3), pp. 437-440.
3. A.J. Laub and G.R. Shiflett, 1982, "A Linear Algebra Approach to the Analysis of Rigid Body Displacement from Initial and Final Position Data," *ASME J. Appl. Mech.*, 49(1), pp. 213-216.
4. A.J. Laub and G.R. Shiflett, 1983, "A Linear Algebra Approach to the Analysis of Rigid Body Velocity from Position and Velocity Data," *ASME J. Dyn. Sys. Meas. & Contr.*, 105(2), pp. 92-95.
 - (a) A.J. Laub and G.R. Shiflett, 1984, "A Linear Algebra Approach to the Analysis of Rigid Body Velocity from Position and Velocity Data — Authors Closure," *ASME J. Dyn. Sys. Meas. & Contr.*, 106(3), pp. 240-241.
5. A.L. Carter, A.J. Laub and G.R. Shiflett, 1984, "The Solution of Higher Order Integration Formulas for Dynamic Response Equations by the Conjugate Gradient Method," *Int. J. Numerical Methods in Engineering*, 20(2), pp. 339-351.
6. A. Arabyan, G.R. Shiflett and C.Y. Sun, 1984, "A Simplified, Microcomputer-based Method for Gear Design," *ASME Paper 84-DET-207*.
7. A. Arabyan and G.R. Shiflett, 1986, "A Method for Determining All Gear Pairs which Satisfy Velocity and/or Center Distance Constraints," *ASME Paper 86-DET-190*.
8. A. Arabyan and G.R. Shiflett, 1987, "A Method for Determining the Various Gear Trains that Provide a Specific Velocity Ratio," *J. Mech., Trans., & Aut. Des.*, 109(4) 475-480.
9. D.A. Erwin, J.A. Kunc, E.P. Muntz, and G.R. Shiflett, 1992, "Transient Energy-Release Pressure-Driven Microdevices," *Journal of Microelectromechanical Systems*, 1(3), 1992, pp. 155-163.
10. A.J. Laub and G.R. Shiflett, 1995, "The Analysis of Rigid Body Motion from Measured Data," *ASME J. Dyn. Sys. Meas. Contr.*, 117(4), pp. 578-584.
11. D. Swett and G.R. Shiflett, 1997, "Edge Stresses in a Composite Strip Subjected to Axial Temperature Gradients, Part I: Development of the Theoretical Solution", *J. Comp. Mat.*, 31(13): 1334-1361.
12. D. Swett and G.R. Shiflett, 1997, "Edge Stresses in a Composite Strip Subjected to Axial Temperature Gradients, Part 2: Evaluation of Numerical Results", *J. Comp. Mat.*, 31(16): 1574-1592.
13. S.E. Vargo, E.P. Muntz, G.R. Shiflett, 1999, "The Knudsen Compressor as a Micro- and Meso-scale Vacuum Pump without Moving Parts or Fluids", *J. Vac. Sci. & Tech. A-Vac. Sur. & Films*, 17(4), pp. 2308-2313.

Conference publications

1. A.J. Laub and G.R. Shiflett, 1982, "A Linear Algebra Approach to the Analysis of Rigid Body Motion from Position and Velocity Data," Proceedings of the Second IFAC Symposium on Computer Aided Design of Multivariable Technological Systems, (G. Leininger, Ed), pp. 19-25.
2. H. Flashner, Y. Guo, G. Shiflett, and V. Spector, 1986, "Laboratory Robot for Space Application Research," Proceedings of the AIAA Guidance, Navigation, and Control Conference, Williamsburg, Virginia, August 17-19, pp. 599-607.
3. D.A. Erwin, J.A. Kunc, E.P. Muntz, and G.R. Shiflett, 1992, "Transient Pressure Driven Microdevices," Proceedings of the ASME, 1992 Winter Annual Meeting, Dynamic Systems and Control Division (DSC), Micromechanical Systems, v. 40, pp. 103-118.
4. D. Swett and G.R. Shiflett, 1996, "Edge Stresses in a Laminated Composite Strip Subjected to Axial Temperature Gradients", Proceedings of the ASME, Aerospace Division AD, v51, pp. 189-209.
5. M. Young, G.R. Shiflett, E.P. Muntz, S. Vargo, 2001, "Thermal transpiration as a co-located micro-scale source of high pressure gas for MEMS devices," Micro-Electro-Mechanical Systems. Proceedings 2001 ASME International Mechanical Engineering Congress and Exposition, v2, pp. 3201-3210.
6. M. Young, S. Vargo, G.R. Shiflett, E.P. Muntz, A. Green, 2001, "The Knudsen Compressor as an energy efficient micro-scale vacuum pump," Micro-Electro-Mechanical Systems. 2001 ASME International Mechanical Engineering Congress and Exposition, pp. 433-41.
7. M. Young, Y.L. Han, E.P. Muntz, G.R. Shiflett, A. Ketsdever, A. Green, 2003, "Thermal transpiration in microsphere membranes," Rarefield Gas Dynamics. 23rd International Symposium, AIP Conference Proceedings , 663, pp. 743-51.
8. M. Young, Y.L. Han, E.P. Muntz, G.R. Shiflett, 2003, "Characterization of a radiantly driven multistage Knudsen Compressor," ASME Micro-Electromechanical Systems Division Publication , v5, pp. 393-400.
9. Y.L. Han, M. Young, E.P. Muntz, G.R. Shiflett, 2005, "Knudsen compressor performance at low pressures," 24th International Symposium on Rarefied Gas Dynamics RGD24, AIP Conference Proceedings, 762, pp. 162-7.
10. M. Young, Y.L. Han, E.P. Muntz, G.R. Shiflett, 2005, "Characterization and optimization of a radiantly driven multi-stage Knudsen compressor," 24th International Symposium on Rarefied Gas Dynamics RGD24, AIP Conference Proceedings, 762, pp. 174-9.

Conference presentations

1. A.J. Laub and G.R. Shiflett, 1982, "Analysis of Rigid Body Displacement by Linear Algebra Techniques," SIAM Conf. on Applied Linear Algebra, Raleigh, North Carolina, April 1982.
2. A.J. Laub and G.R. Shiflett, 1982, "A Linear Algebra Approach to the Analysis of Rigid Body Motion from Position and Velocity Data," Second IFAC Symp. Computer Aided Design of Multivariable Technological Systems, West Lafayette, Indiana, September 19-24, 1982.

3. G.R. Shiflett, 1984, "The Design and Development of a Modeling/Simulation/Control Laboratory," invited talk at the 1984 ACC Conference/Workshop on Laboratories and Simulation in Automatic Control Education, San Diego, June 1984.
4. G.R. Shiflett, 1984, "Computer-Aided Gear Design," ASME Design Technical Conference on Power Transmission and Gearing, Cambridge, Massachusetts, October 1984.
5. G.R. Shiflett, 1986, "Some Numerical Techniques for Gear Design," ASME Mechanisms Conference, Columbus, Ohio, October, 1986.
6. E.P. Muntz and G.R. Shiflett, 1992, "Transient Energy-Release Pressure-Driven Microdevices," ASME Winter Annual Meeting, Anaheim, California, November, 1992.
7. D.C. Wadsworth, E.P. Muntz, R.F. Blackwelder, and G. R. Shiflett, 1993, "Transient Energy-Release Microactuators for Control of Wall-Bounded Turbulent Flows," AIAA-93-3271, AIAA, AIAA Shear Flow Conference, Orlando, Florida, July 6-9.
8. E.P. Muntz and G.R. Shiflett, 1993, "Nanosecond, Transient Pressure Activated Micromechanical Switches," 46th Annual Meeting of the Division of Fluid Mechanics of the American Physical Society, Albuquerque, New Mexico, November, 1993.
9. D. Swett and G.R. Shiflett, 1996, "Edge Stresses in a Laminated Composite Strip Subjected to Axial Temperature Gradients", ASME Winter Annual Meeting, Atlanta, Georgia, November, 1996.

Technical Reports

1. G.R. Shiflett, 1978, A Model for the Swing Hammermill Size Reduction of Residential Refuses, Ph.D. Thesis, University of California, Berkeley.
2. G.M. Savage, G.R. Shiflett, 1980, Processing equipment for resource recovery systems. Volume 3: Field test evaluation of shredders [Final Report], EPA-600/2-80-007C.
3. D. Bendersky et al., 1982, Resource Recovery Processing Equipment, Pollution Technology Review Series #93, Noyes Data Corporation, Park Ridge, New Jersey.

Patents

1. D.A. Erwin, J.A. Kunz, E.P. Muntz, G.R. Shiflett, 1992, Transient Energy Release, Pressure Driven Microdevices, U.S. Patent 5186001.
2. E.P. Muntz, R.N. Nottenburg, G.R. Shiflett, 1994, Transient energy release microdevices and methods, U.S. Patent 5,367,878.
3. S.E. Vargo, E.P. Muntz, G.R. Shiflett, 2003, Thermal transpiration pump, U.S. Patent 6,533,554.

Service

University Committees:

Academic Computing (1989-91) [Chair 89-90]
Academic Policies and Procedures (1984-88, 2004-2006)
Academic Policies and Teaching (2002-03) [Chair 2002-03]
American Language Institute Advisory (1988-89)
Blackboard Advisory (2006-2009)
Graduation and Retention (1992-1994)
Patent (1991-2001)
Undergraduate Curriculum (1998-2005) [Chair, Science/Engineering Panel (1998-2005)]

School of Engineering Committees:

Academic Planning and Budget Advisory (1987-88)
Computer Committee (1982-90) [Chair 85-90]
Curriculum Review Task Force (1992-1998)
Engineering Academic Center (1997-1998)
Merit Review Review (1989, 2005, 2009)
Promotion and Tenure (1989-1990, 1993-95, 2005-2009)
Summer Overseas Program (2000-present)
Recruitment (1986-88)

Aerospace and Mechanical Engineering Committees:

Curriculum (1980-present)
Merit review (2006, 2008-2009) [Chair 2008]
Undergraduate Affairs (1983-89, 1991-present)

Other:

Acting Chair, Department of Mechanical Engineering (1989-90)
ASME advisor (1984-present)
Director of the WVT Rusch Undergraduate Engineering Honors Program (1992-2000)
Graduate advisor, Mechanical design (1979-present)
SAE advisor (1984-present)
Undergraduate advisor (1979-present)

Partial list of subjects taught

Computational Solutions to Engineering Problems
Computer-Aided Analysis for Aero-Mechanical Design
Dynamics
Dynamics of Machinery
Design of Dynamic Systems
Engineering Thermodynamics
Intermediate Kinematics
Introduction to Mechanical Engineering
Introduction to MEMS
Introduction to Computational Methods
Kinematics of Machines
Numerical Methods in Engineering
Optimal Design
Statics
Undergraduate Design Projects

Instructional software tools taught and/or used

Computer languages

Fortran, Matlab, L^AT_EX

Solid modeling

Inventor, Solid Edge, SolidWorks

Finite element analysis

SolidWorks Simulation, Femap/Nastran, Patran/Nastran

Product lifecycle management

NX