

Walter Herbert Gerstle

October 2012

Personal

Work Address

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Personal Data

Born in Boulder, Colorado, January 28, 1956
Citizen of U.S.A.
Married; one son

Education

Doctor of Philosophy Degree, January, 1986; School of Civil and Environmental Engineering, Cornell University, Ithaca, NY
Master of Science Degree, May, 1982; School of Civil and Environmental Engineering, Cornell University, Ithaca, NY
Bachelor of Science Degree, "With Special Honors", May, 1978; Department of Civil and Environmental Engineering, University of Colorado, Boulder, CO
Harvey Mudd College, Sept. 1974 to June 1976; Major: Engineering

Career Experience

2007-2008: On sabbatical leave at National Institute of Standards and Technology and at Sandia National Laboratories
Summer, 2003: Contractor, Sandia National Laboratories, Albuquerque, NM.
1999-present: Professor, Department of Civil Engineering, University of New Mexico, Albuquerque, NM.
1992 - 1999: Associate Professor; Department of Civil Engineering, University of New Mexico, Albuquerque, NM.
1986 - 1992: Assistant Professor, Department of Civil Engineering, University of New Mexico, Albuquerque, NM.
1993-1994: Academic Year on Sabbatical Leave, Contractor at Sandia National Laboratories:
Summer, 1991: AFOSR Summer Faculty Fellow, Phillips Laboratory, Albuquerque, NM.
Summer, 1989: NASA/Langley Summer Faculty Fellow, NASA/Langley, Hampton, VA.
1985-1986: Member of Technical Staff, Sandia National Laboratories, Albuquerque, NM
1980-1985: Teaching and Research Assistant, Cornell University, Department of Structural Engineering, Ithaca, NY
Summer, 1984: Contractor, Lawrence Livermore National Laboratory, Livermore, CA
1979-1980: Architectural Engineer, Richard Weingardt Consultants, Denver, CO
1978: Architectural Engineer, W. L. Simons and Associates, Lakewood, CO
Summer, 1977: Assistant Engineer, Surveyor, Zoyiopoulos and Associates, Greeley, CO

Activities in Professional Societies

American Society of Civil Engineers: Member 1978-present
President, Albuquerque Branch, 1989-1990
Member National Committee 447, "Finite Element Analysis of Reinforced Concrete Structures"
Member, ASCE/EMD Committee on Properties of Materials, 1996-present
Associate Editor, ASCE Journal of Structural Engineering, 1996-1999
Book Review Editor, ASCE Journal of Structural Engineering, 2000-present
State Board Member, 1989-1990
American Concrete Institute: Member 1986-present;
Chair Committee 446 "Fracture Mechanics", 2008-present
Fellow, 2002-present
Chair Committee 446 "Fracture Mechanics", 1998-2006
Secretary National Committee 446, "Fracture Mechanics" 1993-1998
Chair National Subcommittee 446-III "Finite Element Analysis", 1992-1998
American Society for Testing of Materials: Member 1986-95
Member National Committee E-24, "Fracture Mechanics"
Society for Experimental Mechanics: Member 1989-1994
National Society for Professional Engineers: Member 1986-present
Member New Mexico Section calling committee 1987-1995
Engineering Societies Presidents Council: Member, 1989-1990
Chi Epsilon Honorary Fraternity: Member 1978-present; Faculty Advisor: 1997-2001
Sigma Xi: Member 1994-present;
UNM Chapter Sigma Xi President, 2003 - 2006
UNM Chapter Sigma Xi President-Elect, 2002 - 2003
UNM Chapter Sigma Xi Secretary 2000-2002
UNM 21 Club: 2003 - present

Awards and Honors

New Mexico Chapter, National Society for Professional Engineers, "Outstanding Service Award 2012"
Stamm Award, Department of Civil Engineering, UNM, 2011
Structural Engineers Association of Illinois (SEAOI) Award outstanding paper in ACI Structural Journal
Fellow, American Concrete Institute, 2002-present
Commendable Poster Award for "Gas-Driven Hydrofracture at WIPP", Hazardous Substance Research
Center/Waste Management Education and Research Consortium Joint Conference on the Environment,
May 21-23, Albuquerque, NM, 1996.
Received Associated Western Universities Fellowship to fund one-third of 1993-1994 sabbatical leave at Sandia
National Laboratories.
Tom Popejoy Society, University of New Mexico: Member 1988-present
Presidential Young Faculty Award, University of New Mexico, 1988
Judge for New Mexico Consulting Engineer Council Engineering Excellence Competition, 1991.
Registered Professional Engineer in New Mexico and Colorado
Graduate student, Ming Xie, won Outstanding Graduate Student in Civil Engineering Department, 1991
Honorable mention, best journal paper during one year period (June 1991 - June 1992), ASCE Journal of the
Aerospace Division (see publication list for reference).

Structural Engineers Association of Illinois 2008 Publication Award of Merit, for ACI Structural Journal paper
“Justification of ACI 446 Proposal...” (see publication list for reference).

Funded UNM Research Projects

- “Co-registered Vibrometry and Imaging: A Combined Synthetic-Aperture Radar and Fractional-Fourier Transform Approach”, funded by Naval Postgraduate School, \$314,041 total, (Majeed Hayat, PI (ECE); Walter Gerstle, Co-PI (CE) (\$35,323); Balu Santhanam, Co-PI (ECE)), 9/30/2011 - 9/30/2012
- “Photovoltaic Structural Research”, funded by Sandia National Laboratories, PI, \$60,000, 2011-2012
- “Laboratory Testing of Pressurized Drill Pipe Casing Joint”, funded by Sandia National Laboratories, PI, \$50,000, 2010-2011
- “UNM Bridge Load Rating Project – Phase II”, funded by NMDOT, Walter Gerstle, PI, \$400,000, 7/19/2010 - 5/31/2014
- “Development of Thermally Tunable Struts for Support of Optical Telescope Elements”, funded by AFOSR, Christos Chistodoulou, PI, (\$50,000 for Gerstle) 7/15/2009-7/15/2012
- “Bridge Load Rating Project”, funded by NMDOT, Walter Gerstle, PI, \$83,292, 5/15/2009-5/15/2010
- “Algorithms and Methodologies for Detecting Vibrations Using Synthetic Aperture Radar: A Fractional-Fourier Transform Approach”, DOE (NNSA) Award #DE-FG52-08NA28782, \$845,000, (Majeed Hayat, PI (ECE); Walter Gerstle, Co-PI (CE) (\$111,032); Balu Santhanam, Co-PI (ECE)), 9/12/2008 – 9/11/2011
- “Co-registered Vibrometry and Imaging: A Combined Synthetic-Aperture Radar and Fractional-Fourier Transform Approach”, funded by NSF Proposal Number IIS 0813747, \$748,538, (Majeed Hayat, PI (ECE); Walter Gerstle (\$119,457), Co-PI (CE); Balu Santhanam, Co-PI (ECE)), 8/30/2008 - 8/30/2012
- “Near Earth Space Surveillance Initiative”, funded by Air Force Research Laboratory (John McGraw, PI), 10/30/2004 - present
- “Long Wavelength Array”, funded by Naval Research Laboratory (Greg Taylor and Jack McIver co-PIs), 10/30/2006 - present
- “Long Wavelength Demonstration Array”, funded by Applied Research Laboratory, UT Austin (Frank Gilfeather and Jack McIver co-PIs), 10/30/2005 - 10/30/2006.
- “Analysis of Surface Vibrations Resulting from Machinery in Buildings – Phase III”, funded by Sandia National Laboratories, \$102,246, 2/15/2006 – 10/30/2006.
- “Analysis of Surface Vibrations Resulting from Machinery in Buildings – Phase II”, funded by Sandia National Laboratories, \$54,111, 2/15/2005 – 2/15/2006 (with Tim Ross, Co-PI).
- “Analysis of Surface Vibrations Resulting from Machinery in Buildings”, funded by Sandia National Laboratories, \$134,207, 11/21/2003 – 11/15/2004 (with Tim Ross, Co-PI).
- “Solar Rack Design Software – Phase II”, funded by UniRac, Inc., \$10,841, 7/14/03 – 12/19/03.
- “Solar Rack Design Software”, funded by UniRac, Inc., \$10,806, 2/03-7/14/03.
- "Cellulose-Earth Material for Rural Homes", SANCO Enterprises, SBIR proposal funded by the USDA, \$17,880, 5/99-11/99.
- "Data Models and Formats Research", funded by Sandia National Laboratories, \$40,000, 2/16/1999-1/31/2000.
- "Finite Element Meshing Approached as a Global Minimization Process- Phase III", funded by Sandia National Laboratories, \$50,000, 11/1998 - 10/1999.
- "Deployable Space Structure Research", funded by Air Force Research Laboratory, \$492,646, 12/1997-2/2001.
- "Finite Element Meshing Approached as a Global Minimization Process- Phase II", funded by Sandia National Laboratories, \$50,000, 11/1997 - 10/1998.

"Research Experiences for Undergraduates in Civil Engineering", NSF, \$65,155., 5/1997-8/1997, (with Tim Ross, Co-PI, Grant No. EEC-9322063, Amendment 003).

"Finite Element Meshing Approached as a Global Minimization Process", funded by Sandia National Laboratories, \$70,000., 11/1996 - 10/1997.

"Design and Implementation of a Virtual Geometry Interface", funded by Sandia National Laboratories, \$18,000., 9/1996 - 5/1997.

"Approximate Finite Element Meshing using Fuzzy Surface Tessellation", funded by Autonomous Control in Engineering Center, (NASA), 1995-1999, (with Tim Ross), approximately \$150,000. per year for five years.

"Development of Waste Gas Pressure Relief Mechanism for Waste Isolation in Salt Beds", DOE/WERC, \$90,000., 7/1996 - 6/1997, PI, (with Lary Lenke, Co-PI).

"Prediction of Combined Smeared and Discrete Mechanisms in WIPP Rock Salt - Phase II", DOE/WERC, \$61,000., Feb. 1994 - Aug. 1995., PI, (with Zhen Chen, Co-PI)

"Research Experiences for Undergraduates in Civil Engineering ", NSF, \$155,849., 1994-1997, (with Tim Ross, Co-PI, Grant No. EEC-9322063).

"Gas-Driven Hydrofracture at WIPP", Sandia National Laboratories, \$27,301., 12/93-12/94.

"Crack Width and Spacing in Reinforced Concrete", UNM Research Allocation Committee, \$1,900., April 20, 1993-Sept. 30, 1993.

"Research Education for Undergraduates", NSF, \$39,923., 1993-1994, (with Tim Ross, Co-PI, Grant No. EEC-9300952).

"Prediction of Combined Smeared and Discrete Mechanisms in WIPP Rock Salt - Phase I", DOE/WERC, \$60,000., Feb. 1993 - Aug. 1994., PI, (with Zhen Chen, Co-PI).

"Basic Ordering Agreement", PI, Re/Spec, Inc., 1990-open,
 Task 1 \$3,200. (8-90 to 2-91)
 Task 2 \$2,600. (5-91 to 7-91)

"Research Education for Undergraduates", NSF, \$38,555., 1991-1992, (Co-PI with Tim Ross, PI, Grant No. EID-9100822) .

"Research Education for Undergraduates", NSF, \$35,172., 1990-1991, (Co-PI with Tim Ross, PI, Grant No. 9000744)

"NASA Lunar Observatory Project", PI, NASA, \$17,000., 1990-1991, (with K-M. Chua, Co-PI, New Mexico State University Subcontract)

"A New Integrated, Computer Graphical Design Tool- Phase II", PI, NSF \$110,000., 1989 to 1991, (SBIR with Re/Spec, Inc.)

"General-Purpose Postprocessing System" ARCO Oil Company, PI, \$11,000., 1990-1991, (Subcontract with Re/Spec, Inc.)

"Finite Element and Boundary Element Modeling of Crack Propagation in Three-Dimensional Structures", NSF, PI, \$56,000., 1987-1990, (Grant No. MSM-8706409)

"Development of an Automated 3-D Finite Element Mesh Generator -Phase II", Sandia National Laboratories, PI, \$30,000., 1988-1989

"Prototype Integrated Interactive Graphical Analysis Software System", ARCO Oil Company, PI, \$18,750., 1988-1989, (Re/Spec, Inc. Subcontract)

"Development of an Automated 3-D Finite Element Mesh Generator", Sandia National Laboratories, PI, \$30,000., 1987-1988.

"A New Integrated, Computer Graphical Design Tool", NSF, PI, \$16,501., 1988, (SBIR with Re/Spec, Inc.)

Consulting Contracts (smaller consulting projects not listed)

- "Expert Witness" several projects as expert witness on structural failures.
"Structural Analysis of Telescopes", DFM Engineering, Inc., Longmont, CO., ongoing structural consulting.
"Support Structures for Solar Panels" UniRac, Inc., ongoing structural consulting.
"Structures for Solar Arrays" Array Technologies, Inc., ongoing structural consulting.
"Investigation of Deformations and Stresses in Stainless Steel Pool Liner for Sandia National Laboratories Building 6586 Gamma Irradiation Facility", K.L. House Construction, Albuquerque, NM, 5/99.
"Hydrofracture Behavior of WIPP", Environmental Evaluation Group, Albuquerque, NM, 3/1/98-4/1/98.
"Hydrofracture Modeling of WIPP", The Hydrodynamics Group, La Honda, CA., 8/1/97-10/1/97.
"Fracture Analysis of the Northumberland Strait Bridge", J. Muller International, San Diego, CA., 3/1/97-4/20/97.
"Structural Analysis of Laser Beam Director", DFM Engineering, Inc., Longmont, CO., 12/5/91-1/15/92.
"Numerical Fracture Analysis of Grouted Joints for Nuclear Waste Isolation", Swedish Nuclear Agency, PI, 1988-1989, (consulting subcontract to Re/Spec, Inc.)

Publications in Refereed Archival Journals and Refereed Special Publications:

(Graduate Student Coauthors for whom Gerstle served as Advisor are **Highlighted**)
(Graduate Student Coauthors for whom Gerstle served as Advisor are **Bold**)

Disc. 104-S57 / From the Sept.-Oct. 2007 *ACI Structural Journal*, p. 602

- Qi Wang, Q., Pepin, M., Wright, A., Dunkel, R., Atwood, T., Santhanam, B., Gerstle, W., Doerry, A. W., and Hayat, M. M., "Reduction of Vibration-induced Artifacts in Synthetic Aperture Radar Imagery", *IEEE Trans. Geoscience and Remote Sensing*, Vol. ?, No. ?, 2012 (submitted July 2012)
- Gerstle, Walter, **Honarvar Geitanbaf, Hossein, and Asadollahi, Aziz**, "Computational Simulation of Reinforced Concrete using the Micropolar State-Based Peridynamic Hexagonal Lattice Model", *Proceedings of FRAMCOS 8*, Toledo, Spain, March 11-14, 2013 (accepted).
- Gerstle, Walter, **Honarvar Gheitanbaf, Hossein, Asadollahi, Aziz, Tuniki, Bhanu Kiran, and Rahman, Asifur**, "Simulation of concrete using micropolar peridynamic hexagonal lattice model", *Seventh M.I.T. Conference on Computational Fluid and Solid Mechanics*, 12-14 June, 2013 (to be published in *Computers and Fluids*, Elsevier) (accepted).
- Wang, Q., Pepin, M., Beach, R.J., Dunkel, R., Atwood, T., Santhanam, B., Gerstle, W., and Hayat, M. M., "SAR-based Vibration Estimate using the Discrete Fractional Fourier Transform", *IEEE Transactions On Geoscience and Remote Sensing*, Vol. 50, No. 10, Oct. 2012, pp. 4145-4156.
- Gerstle, W., **Sakhavand, N. and Chapman, S.** "Peridynamic Modeling of Reinforced Concrete Lap Splice", *ASCE Engineering Mechanics Institute 2010 Conference*, August 8-11, 2010, Los Angeles, CA.
- Gerstle, W. **Sakhavand, N. and Chapman, S.** "Peridynamic and continuum models of reinforced concrete lap splice compared", *Fracture Mechanics of Concrete and Concrete Structures - Assessment, Durability, Monitoring and Retrofitting of Concrete Structures- B. H. Oh, et al. (eds), Proceedings of the 7th International Conference on Fracture Mechanics of Concrete and Concrete Structures (FraMCoS-7)*, Jeju, Korea, May 23-28, 2010, pp. 306-312, Korea Concrete Institute, Seoul, ISBN 978-89-5708-181-5.
- Gerstle, W., Lenke, L.R., Reda Taha, M., Hays, J.S., Cabrera, A.S., Magallanes, J.M., Martinez, R., "Comparison of stiff tension fracture test and notched beam level II fracture tests", *Fracture Mechanics of Concrete and Concrete Structures - Assessment, Durability, Monitoring and Retrofitting of Concrete Structures- B. H. Oh, et al. (eds), Proceedings of the 7th International Conference on Fracture*

- Mechanics of Concrete and Concrete Structures (FraMCoS-7), Jeju, Korea, May 23-28, 2010, pp. 696-702, Korea Concrete Institute, Seoul, ISBN 978-89-5708-181-5.
- Gerstle, W., "Progress in Developing a Standard Fracture Toughness Test for Concrete", Proceedings of the 2010 ASCE Structures Congress and the 19th Analysis and Computation Specialty Conference, May 12-15, Orlando, Florida, edited by Senapathi, Casey, and Hoit, ASCE Structural Engineering Institute, pp. 1915-1926, 2010.
- Fu, R.**, Gerstle, W., Zimmer, P. and McGraw, J., "In-Situ Measurement of Environmentally-Induced Deformations of Telescopes", ASCE Space 2010 Conference, March 17-22, Honolulu, Hawaii, 2009, on CD.
- Gerstle, W., **Sau, N.** and **Sakhvand, N.**, "On Peridynamic Computational Simulation of Concrete Structures", proc. Tom Hsu Symposium on Shear and Torsion in Concrete Structures, ACI SP-265, pp. 245-264, 2009.
- Gerstle, W., Silling, S., Read, D., Tewary, V. and Lehoucq, R., "Peridynamic Simulation of Electromigration", Computers, Materials and Continua, Tech Science Press, Vol. 8, No. 2, pp. 75-92, 2008.
- Bazant, Z. P., Yu, Q., Gerstle, W., Hanson, J., and Ju, J., "Justification of ACI-446 Proposal for Updating ACI Code Provisions for Shear Design of Reinforced Concrete Beams", ASCE Structural Journal, Vol. 104., No. 5, pp. 601-610, Sept.-Oct. 2007.
- Gerstle, W., and **Sau, N.**, and Silling, S. "Peridynamic Modeling of Concrete Structures", Journal of Nuclear Engineering and Design, No. 237, pp. 1250-1258, 2007.
- Gerstle, W., "Book Review: Two Handbooks on Structural Steel Design", J. Structural Engng., ASCE, Vol. 129, No. 6, p. 842, June 2003.
- Gerstle, W., "Toward a Meta-Model for Computational Engineering", Engineering with Computers, Vol. 18, Issue 4, pp 328-338, Springer-Verlag, London, 2002.
- Lenke, L.** and Gerstle, W., "Tension Test of Stress Versus Crack Opening Displacement Using Cylindrical Concrete Specimens", ACI SP201, pp. 189-206, 2001.
- Sahu, R.**, Panthaki, M., and Gerstle, W., "An Object-Oriented Framework for Multidisciplinary, Multi-Physics, Computational Mechanics", Engineering with Computers, Vol.15, pp. 105-125, Springer-Verlag, London, 1999.
- Gerstle, W., Lenke, L., and **Heo, G.**, "Stress-Intensity Factor Calibration of Edge-Notched Beam", Fatigue and Fracture Mechanics, ASTM STP 1296, West Conshohocken, PA, pp. 530-549, 1997.
- Gerstle, W., "Book Review: Fracture Mechanics of Concrete: Applications of Fracture Mechanics to Concrete, Rock, and other Quasi-Brittle Materials", J. Structural Engng., ASCE, Vol. 122, No. 11, Nov. 1996, pp. 1390-1391.
- Gerstle, W., **Xie, M.**, **Liu, Q.**, and Chen, Z., "Gas-Driven Cracking in WIPP Rock Salt", Radioactive Waste Management and Environmental Restoration, Vol. 20, pp. 93-110, 1996.
- Xie, M.**, and Gerstle, W., "Energy-Based Cohesive Crack Propagation Modeling" J. Engng. Mechanics, ASCE, Vol. 121, No. 12, 1995.
- Xie, M.**, Gerstle, W., and **Rahul Kumar, P.**, "Energy-Based Automatic Mixed-Mode Crack Propagation Modeling" J. Engng. Mechanics, ASCE, Vol. 121, No. 8 1995.
- Xie, M.**, Gerstle, W., and Chen, Z., "Finite Element Analysis of Combined Smeared and Discrete Mechanisms in Rock Salt", Computer Methods and Advances in Geomechanics, Vol II, Siriwardane, H.J. and Zaman, M.M. Eds., A. A. Balkema, pp. 1659-1664, 1994.
- Gerstle, W., **Prasad, N. N. V.** and **Xie, M.**, "Solution Method for Elastostatic Coupled BEM and FEM Analysis", Proc. Boundary Element Technology VII, Brebbia and Ingber, Eds., Elsevier Applied Science, Computational Mechanics Publications, 1992, pp. 213-226.

- Gerstle, W., **Rahulkumar, P., Dey, P. P. and Xie, M.**, "Size Effect in Reinforced Flexural Members", ACI SP-134 "Design Based on Fracture Mechanics", Gerstle and Bazant, Eds., 1992, pp. 25-45.
- Gerstle, W., **Dey, P.P., Prasad, N.N.V., Rahulkumar, P., and Xie, M.**, "Crack Growth in Flexural Members- A Fracture Mechanics Approach", ACI Structural Journal, Vol. 89, No. 6, pp. 617-625, Nov., 1992.
- Gerstle, W. and **Xie, M.**, "FEM Modeling of Fictitious Crack Propagation in Concrete", ASCE Journal of Engineering Mechanics, Vol. 118, No. 2, 1992.
- Akgul, F.**, Gerstle, W. H. and Johnson, S. W., "Structural Design of Lunar Radio Telescope Using Interactive CAD", J. Aerospace Engineering, ASCE, Vol. 5, No. 1, Jan, 1992.
- Gerstle, W. and Ingraffea, A., "Does Bond-Slip Exist?", Concrete International, American Concrete Institute, Vol. 13, No. 1, pp. 44-48, Jan. 1991.
- Gerstle, W., and Ingraffea, A., "Compliance and Stress-Intensity Factor Calibration of the CENRBB Specimen Using the Boundary Element Method", International Journal of Rock Mechanics and Mining Sciences, Vol. 28 No. 1, Jan. 1991.
- Gerstle, W. H. and **Abdalla, J., E.** "Finite Element Meshing Criteria for Crack Problems," Fracture Mechanics: Twenty-First Symposium, ASTM STP 1074, J.P. Gudas, et al., Eds., American Society for Testing and Materials, Philadelphia, pp. 509-521, 1990.
- Johnson, S., Burns, J., Chua, K.-M., Duric, N., Gerstle, W. and Taylor, J., "Lunar Astronomical Observatories: Design Studies", Journal of Aerospace Engineering, ASCE, Vol. 3, No. 4, pp. 211-222, Oct. 1990.
- Gerstle, W., Ingraffea, A., Perucchio, R., "Three-Dimensional Fatigue Crack Propagation Analysis Using the Boundary Element Method," International Journal of Fatigue, Vol. 10, No. 3, pp. 189-192, 1988.
- Gerstle, W., Martha, L., Ingraffea, A., "Finite and Boundary Element Modeling of Crack Propagation in Two and Three Dimensions," Engineering with Computers, Vol. 2, pp. 167-183, 1987.
- Ingraffea, A. R., Gerstle, W. H., Mettam, K. I., Wawrzynek, P., and Hellier, A. K., "Cracking of Welded Crane Runway Girders: Physical Testing and Computer Simulation", Iron and Steel Engineer, December 1985, pp.46-52.
- Ingraffea, A. R., Gerstle, W. H., Gergely, P., and Saouma, V., "Fracture Mechanics of Bond in Reinforced Concrete", Journal of the Structural Division, American Society of Civil Engineers, Vol. 110, No. 4, April 1984, pp. 871-890.
- Ingraffea, A. R., Perrucchio, R., Han, T.-Y., Gerstle, W. H., and Huang, Y.-P., "Three-Dimensional Finite and Boundary Element Calibration of the Short-Rod Specimen", Chevron-Notched Specimens: Testing and Stress Analysis, ASTM STP 855, J. H. Underwood, et al., Eds., American Society for Testing and Materials, Philadelphia, 1984, pp. 49-68.

Books Edited

Gerstle, W. and Bazant, Z., Editors, "Concrete Design Based on Fracture Mechanics", ACI SP-134, 1992.

Book Chapters

Read, D. T., Gerstle, W. H., and Tewary, V. K. , "Modeling electromigration using the peridynamics approach", Electromigration in thin films and electronic devices: Materials and reliability, Edited by C-U Kim, Woodhead Publishing Limited, 2011.

Conference and Symposium Proceedings

(* indicates refereed paper; Names of Graduate Students for whom Gerstle served as Advisor are **Highlighted**)

- Wang, Q., Pepin, M., Dunkel, R., Atwood, T., Doerry, A., Santhanam, B., Gerstle, W., Hayat, M., "Reduction of Vibration-Induced Artifacts in Synthetic-Aperture-Radar Imagery using the Fractional Fourier Transform", Proc. IEEE International Conference on Image Processing, Sept. 30 – Oct. 3, 2012, Orlando, Florida.
- Wang, Q., Pepin, M., Dunkel, R., Atwood, T., Doerry, A. W., Santhanam, B., Gerstle, W., and Hayat, M. M., "Reduction Of Vibration-Induced Artifacts In Synthetic-Aperture-Radar Imagery Using The Fractional Fourier Transform", submitted to International Conference on Image Processing, Orlando, Sept 30-Oct. 3, 2012.
- *Gerstle, W., **Sakhavand, N., Rahman, A., and Tuniki, B. K.**, "Simulation of Concrete using Micropolar Peridynamic Hexagonal Lattice Model", 11th U.S. National Congress on Computational Mechanics, Minneapolis, July 25-28, 2011.
- *Gerstle, W., **Sakhavand, N., and Tuniki, B. K.**, "Peridynamic Modeling of Prestressed Concrete Beams", Intl. Conf. on Industrial and Applied Mathematics, Vancouver, BC, Canada, July 18 – 22, 2011.
- Gerstle, W., **Chapman, S., and Montoya, K.**, "Experiences with Bridge Load Rating at UNM", Forty-Seventh Paving and Transportation Conference, January 4, 2010 (invited presentation).
- Madrid, M., Simpson, J., Santhanam, B., Gerstle, W., Atwood, T. and Hayat, M. M., "Modeling Electromagnetic Wave Interactions with Vibrating Structures", IEEE AP-S/URSI Conference, June 1, 2009.
- Namir E. Kassim, A. S. Cohen, P. C. Crane, C. A. Gross, B. C. Hicks, W. M. Lane, J. Lazio, E. J. Polisensky, P. S. Ray, K. W. Weiler, T. E. Clarke, H. R. Schmitt, J. M. Hartman, J. Craig, W. Gerstle, Y. Pihlstrom, L. J. Rickard, G. B. Taylor, S.W. Ellingson, L. R. D'Addario, R. Novarro, "Exploring the Last Electromagnetic Frontier with the Long Wavelength Array (LWA)", 214th Meeting of the American Astronomical Society, Pasadena, CA, 7-11 June 2009.
- Gerstle, W., "Computational Modeling of Nanostructures using the Peridynamic Model", Proceedings of the International Conference on Computational & Experimental Engineering and Sciences, ICCES08, Mar 16-22, 2008: Honolulu, Hawaii, Tech Science Press, 2008.
- Gerstle, W., "Peridynamics Applied to Reinforced Concrete Structures and Microchips", Sandia National Laboratories, Albuquerque, New Mexico: April 9, 2008.
- Silling, S.A., Demmie, P.N, Foster, J. T., Gerstle, W., Warren, T. L., "Concrete Fracture and Failure Modeling with Peridynamics", Workshop on Modeling Concrete under High-Impulsive Loadings", Institute for Advanced Technology, University of Texas at Austin Austin, TX 2007.
- Gerstle, W., "Computational Modeling of Nanostructures using the Peridynamic Model", National Institute of Standards and Technology, Boulder, Colorado: Dec. 7, 2007.
- *Gerstle, W., **Sau, N., and Aguilera, E.**, "Micropolar Peridynamic Constitutive Model for Concrete", 19th Intl. Conf. on Structural Mechanics in Reactor Technology (SMiRT 19), Toronto, Canada, August 12-17, pp. B02/1-2, 2007.
- *Gerstle, W. H., **Sau, N., and Aguilera, E.**, "Micropolar Modeling of Concrete Structures", Proceedings of the Sixth International Conference on Fracture Mechanics of Concrete Structures, Ia-FRAMCOS, Catania, Italy, June 17-22, 2007.
- McGraw, J. T., Ackermann, M. R., Williams, T., Zimmer, P.C., Gerstle, W. H., Benedict, G. F., Odewahn, S. C., Wetterer, C. J., Gamiz, V. L., Claver, C. F., Pier, J. R., Hines, D. C., Schwarz, J., and the NESSI/CTI-II Research Group. "The Quest for Precision Ground-Based Astronomy: The CCD/Transit Instrument with Innovative Instrumentation (CTI-II)", Proc. American Astronomical Society Convention, Seattle, 5-10 January 2007.

- Ray, York, Kerkhoff, Slack, Copeland, Munton, Banks, Gaussiran, Hicks, Paravastu, Kassim, Weiler, Polisensky, Crane, Gerstle, Pihlstrom, Taylor, Ellingson, "First Light for the Long Wavelength Development Array", Proc. American Astronomical Society Convention, Seattle, 5-10 January 2007.
- McGraw, J. T., Ackermann, M. R., Williams, T., Zimmer, P.C., Gerstle, W. H., Benedict, G. F., Odewahn, S. C., Charles J. Wetterer, C. J., Gamiz, V. L., Golden, E., Claver, C. F., Pier, J. R., Hines, D. C., and the NESSI/CTI-II Research Group. "The Quest for Precision Ground-Based Astronomy: The CCD/Transit Instrument with Innovative Instrumentation (CTI-II)", Proc. Advanced Maui Optical and Space Surveillance Technologies Conference, Maui, 10-14 September 2006.
- *Gerstle, W. H., **Roybal, F.**, McGraw, J. T. and Williams, T. "Structural Design of a Unique Passive Telescope," Proceedings of ASCE Earth and Space 2006 Conference, March 6-8, Houston Texas, on CD.
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- Gerstle, W. H., Ingraffea, A. R., and Perucchio, R., "Analysis of Non-Planar, Three-Dimensional Fatigue Crack Propagation Using the Boundary Element Method and Interactive Computer Graphics", 19th National Symposium on Fracture Mechanics, ASTM, June 30, 1986.
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- Gerstle, W. H., "Structural Zooming Research and Development of an Interactive Graphical Interface for Stress Analysis of Cracks", NASA/American Society for Engineering Education (ASEE) Summer Faculty Fellowship Program 1989, Tiwari, S. N. (Compiler), NASA Contractor Report 181894, pp. 67-68, Sept., 1989.
- Panthaki, M. J. and Gerstle, W. H., "StressGraph: A Structural Zooming System, Phase I Final Report", RE/SPEC RSI-0339, 1988.
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Gerstle, W. H., Ingraffea, A. R., and Gergely, P., "The Fracture Mechanics of Bond in Reinforced Concrete", Report 82-7, Department of Structural Engineering, Cornell University, June 1982.

Chairman of Graduate Student Committees (I have served on many other G.S. committees)

MS Degree Students:

Aziz Asadollahi, Ph.D.

Hossein Honarvar, MS, 20??

Ivan Campos, MS, 20??

Rahman, Asifur, MS, "Lattice-Based Peridynamic Modeling of Linear Elastic Solids", 2012

Tuniki, Bhanu Kiran, "Peridynamic Constitutive Model of Concrete", MS 2012

Sakhavand, Navid, "Parallel Simulation Of Reinforced Concrete Structures Using Peridynamics", MS, 2011

McCarty-Glenn, Tess, "Leakage of Drill Pipe Casing Subject to Shear", MS 2011

Chapman, Scott, "Clarification of the Notched Beam Level II Testing Procedures of ACI 446 Committee Report 5", MS, 2011

Fu, Ran, "Metrology of Optical Telescope Components", MS, 2010

Xia, Tong, "Effect Of Air On Vibration Of Structures", MS, 2010

Ortega, Carlos, "Dynamic Gas-Solid Interaction", MS 2008

Aguilera, Eduardo, "Elastic Size Effect Using the Peridynamic Model", MS 2008

Roybal, Francisco, MS

Lee, Yongsub "The Effect of Air on Structural Vibrations", Masters Project, August, 2006.

Mareddy, Shilpa "An Analysis of Service Level Vibrations in a Utility Building", Masters Thesis, May, 2006.

Pei-Yuan Cheng, "A Metamodel for Computational Engineering", Masters Thesis, December, 2003.

Ge Li, "Investigation of 3D Automatic Hexahedral Meshing Approaches", Masters Thesis, December, 2000.

Rajanikanth Jayaseelan, "An Extensibility Mechanism for a Computational Mechanics Framework", Masters Thesis, December, 2000.

Valerio, Robert, "Modelling Concepts Pertaining to a Gas-Driven Hydrofracture Scenario", Masters Thesis, May, 2001.

Funston, Monica, "Quantity: A Computational Subsystem", Masters Thesis, May, 2000.

Yunlong Yang, "Blowout at WIPP Caused by an Inadvertent Penetration", Masters Thesis, May, 1999.

Paul Wolfenbarger, "Exploration of a New Unstructured Quadrilateral Mesh Generation Algorithm", Masters Thesis, December 1998.

Keehn, Sandi, Masters Degree (all course option), 1998.

Malanchara, Anish, "Automatic Delaunay Meshing", Masters Thesis, 1997.

Maberry, Steve, "Fictitious Cracks, Real Cracks, Curling Slabs, and a Search for Alternate Methods of Crack Control", Masters Project, 1997.

Bosiljevac, Thomas, "Rational Design Methods for Post-Tensioned Slabs-on-Grade", Masters Project, 1996.

Guo Yinglong, "Loading Rate Effect on Stress Cracking of High Density Polyethylene Geomembranes", Masters Thesis, 1996.

Guo, Wei, "Automatic Mesh Generation for Crack Propagation Simulation in Planar Domains", Master's, 1995.

Liu, Qing, "Modeling of Gas-Driven Hydrofracture at WIPP", Master's Thesis, 1995.

Heo, Gwanghee, "Stress-Intensity Factor Calibration of Shear Beam", Master's Thesis, 1995.

Prasad, N.N.V., "Interactive Graphical Finite Element Postprocessing", Master's Thesis, 1992.

Rahulkumar, Pakal, "A Study of the Size Effect in Concrete", Master's Thesis, December 1992.
 Dey, Partha Pratim, "Fracture of Concrete Beams Including Size Effect", Master's Thesis, 1992.
 Castillo, Richard, "Structural Stability of Steel Frames", Masters Project, 1991.
 Akgul, F., "An Interactive Graphical Software Tool for the Computer-Aided Structural Design of a Lunar Radio Telescope Reflector", Master's Thesis, 1989.
 Everhart, Robert Douglas, "Calculation of Stress and Strain Using Velocity Data from One-Dimensional Dynamic Material Properties Tests", Master's Thesis, 1989.
 Abdalla, Joao Elias Filho, "A Finite Element for Arbitrarily Precise Determination of Stress Intensity Factors", Master's Thesis, 1988.

Ph.D. Degree Students:

Sau, Nicolas, "Peridynamic Modeling of Reinforced Concrete Structures", Ph.D., expected to be completed in 2007.
 Sahu, Raikanta, "An Object-Oriented Framework for Computational Mechanics", Ph.D., 1998.
 Xie, Ming, "Finite Element Analysis of Discrete Fracture", Ph.D., 1995.
 Nehme, J. A., "Coupled Finite- and Boundary-Element Modeling of Crack Propagation", Ph.D., 1990.

Student Projects Supervised

AISC/ASCE Steel Bridge Building Competition: 2003, 2002, 1999, 1998, 1997, 1996, 1995, 1994, 1993, 1992
 Advisor for NSF Research Experiences for Undergraduates in Civil Engineering Program:
 1996 Leslie Sandoval
 1994 Cyrus Morrow, Jennifer Biggs
 1993 Rita Dominguez
 1992 Reagan Santelle
 1991 Thomas Kratochvil
 1990 Audrey Blea
 Advisor for "Gifted" Highschool Students:
 1996 Kyle Fenton, Valley High School
 1992 John Woodruff, Eldorado High School
 1990 Kirk Cessac, Eldorado High School

Teaching

Courses taught (by semester)

Median ICES student ratings on a scale of 6=excellent, 1=very poor for Course, Instructor, and Content (General)

Median ICES student ratings on a scale of 5=excellent, 1=very poor for Instructor Knowledge and Instructor Enthusiasm (NA=Not Available):

Course/Semester	Number of Students	Progress on Relevant Objectives (Raw)	Excellent Teacher (Raw)	Excellent Course (Raw)	Summary Evaluation (Raw)	
CE691, Spring 2012	38					
CE310, Spring 2012	27					

CE308, Spring 2012	27					
CE424/524 Fall 2011	15	4.0/5.0	4.6/5.0	4.5/5.0	4.3/5.0	
CE502 Fall 2011	16	4.4/5.0	4.9/5.0	4.9/5.0	4.7/5.0	
CE308 Spring 2011	30	3.7/5.0	3.7/5.0	3.9/5.0	3.8/5.0	
CE371 Spring 2011	17	3.7/5.0	4.4/5.0	3.9/5.0	4.0/5.0	
CE502, Fall 2010	21					
CE424/CE524, Fall 2010	17					
CE310, Spring 2010	31					
CE371, Spring 2010	7					
CE304, Statics and Dynamics; F09						
CE424/524, Structural Steel Design; F09						
CE502, Finite Element Analysis; S09						
CE310, Structural Design; S09						
CE304, Statics and Dynamics; F08						
CE424/524, Structural Steel Design; F09						
S08 (on sabbatical leave)						
F07 (on sabbatical leave)						
Course/Semester	Number of Students	Course (General)	Instructor (General)	Content (General)	Instructor Knowledge	Instructor Enthusiasm
CE310, Structural Design; S07	17	4.7	4.5	4.8	3.9	4.1
CE502, Finite Element Analysis; S07	15	5.6	5.7	5.6	4.8	4.7
CE691, Civil Engng. Seminar; F06	33	NA	NA	NA	NA	NA
CE304, Statics and Dynamics; F06	45	5.3	5.7	5.5	4.6	4.7
CS151 MatLab Computing; F06	103	NA	NA	NA	NA	NA

CE310, Structural Design; S06	19	5.2	5.4	5.4	4.7	4.6
CE502, Finite Element Analysis; S06	57	5.1	5.6	5.2	4.7	4.7
CE491, Design Competitions; F05	11	NA	NA	NA	NA	NA
CE491, Design Competitions; S05	11	NA	NA	NA	NA	NA
CE502, Finite Element Analysis; S05	11	5.6	5.6	5.6	4.9	4.9
CE310, Structural Design; S05	22	5.3	5.3	5.3	4.7	4.6
CE304, Statics and Dynamics; F04	61	4.5	5.0	4.6	3.7	3.9
CE501, Adv. Mech. Matls; F04	5	5.0	5.6	5.3	4.6	5.0
CE502, Finite Element Analysis; S04	11	5.2	5.3	5.3	4.6	4.6
CE308, Structural Analysis; S04	27	5.3	5.3	5.4	4.7	4.7
CE310, Structural Design; S04	27	5.1	5.3	5.2	4.7	4.6
CE501, Adv. Mech. Materials; F03	17	5.3	5.5	5.4	4.5	4.4
CE304, Statics and Dynamics; F03	54	5.1	5.2	5.0	4.6	4.6
CE310, Structural Design; S03	23	4.5	4.5	4.8	4.2	4.2
CE502, Finite Element Analysis; S03	7	5.5	5.8	5.3	5.0	5.0
CE424, Structural Steel Design; S03	11	4.0	3.9	4.3	4.3	4.2
CE501, Adv. Mech. Materials; F02	22	4.9	4.9	5.1	4.7	4.6
CE304, Statics and Dynamics; F02	45	5.0	5.1	4.9	4.5	4.6
CE424, Struct. Steel Design; S02	11	5.3	5.1	5.3	4.6	4.6
CE502, Finite Element Analysis; S02	9	4.8	4.8	5.2	4.6	4.6
CE 501, Adv. Mech. Materials; F01	8	4.5	4.0	4.8	4.5	4.5
CE352, Comp. Appl. in CE; F01	20	2.8	4.2	2.8	4.0	3.8
CE518, Structural Stability; F01	10	5.1	5.1	5.2	4.6	4.6
(On Sabbatical Leave) S01						

(On Sabatical Leave) F00						
CE424, Structural Steel Design; S00	9	4.9	4.9	4.9	4.7	4.6
CE502, Finite Element Analysis; S00	7	5.3	5.3	5.2	5.0	4.7
CE501, Adv. Mech. Matl.; F99	12	5.1	5.5	5.5	4.7	4.7
CE202, Statics; F99	20	4.2	3.8	4.9	4.6	4.2
CE502, Finite Element Analysis; S99	12	5.3	5.6	5.1	4.7	5.0
CE424/510 Strt. Steel Design; S99	16	4.6	4.5	4.6	4.3	4.2
CE518, Structural Stability; F98	9	5.3	5.3	5.3	5.0	5.0
CE202, Statics; F98	21	5.6	5.6	5.6	4.7	4.6
CE502, Finite Element Methods; S98	11	5.0	5.5	5.1	5.0	5.0
CE551-4 Fracture Mechanics; S98	7	5.1	5.1	5.0	4.7	4.7
CE513, Design of Strct. Systems; F97	6	5.0	5.6	5.3	5.0	4.7
CE691, Civil Engng. Seminar; F97	26	NA	NA	NA	NA	NA
CE502, Finite Element Analysis; S97	9	5.0	5.2	5.1	5.0	4.5
CE310, Structural Design; S97	33	5.3	5.3	5.2	4.6	4.6
CE401, Adv. Mech. Matls.; F96	14	4.8	4.9	4.9	4.7	4.6
CE518, Theory of Stblty.; F96	7	5.3	5.3	5.3	4.7	4.7
CE310, Struct. Design; S96	32	NA	NA	NA	NA	NA

CE502, Finite Element Analysis; S96	11	5.6	5.7	5.6	4.7	4.7
CE499, Capstone Design; S96	30	NA	NA	NA	NA	NA
CE416, Design of Struct. Syst.; F95	8	4.8	5.0	4.5	4.5	4.7
CE302, Mechanics of Materials; F95	10	5.6	5.6	5.5	4.7	4.7
CE502, Finite Element Analysis; S95	11	4.7	5.0	4.9	4.7	4.7
CE499, Capstone Design; S95	25	NA	NA	NA	NA	NA
CE308, Structural Analysis; F94	5	3.3	3.8	3.3	4.0	3.3
CE551-3, Fracture Mechanics; F94	10	5.1	5.6	5.1	4.7	4.7
(On Sabbatical Leave) S94						
(On Sabbatical Leave) F94						
CE502, Finite Element Analysis; S93	15	4.8	5.6	4.8	4.6	4.7
CE551, Fracture Mechanics; S93	7	5.3	5.6	5.0	4.5	4.7
CE491, Student Bridge Project; S93	8	NA	NA	NA	NA	NA
CE308, Struct. Analysis; F92	15	6.0	6.0	5.7	5.0	5.0
CE202, Statics; F92	25	4.6	4.8	4.4	4.7	4.6
CE421, Struct. Dynamics; F92	8	NA	NA	NA	NA	NA
CE302, Mech. of Matls; Sum92	9	5.5	5.5	5.3	4.7	4.7

CE551-8, Inelastic Analysis; S92	8	5.3	5.7	5.5	4.7	5.0
CE502, Finite Element Analysis; S92	15	5.4	5.4	4.9	4.6	4.7
CE416, Design of Struct. Syst.; S92	6	4.5	4.5	4.3	4.6	4.5
CE551-8, Fract. Mechanics; F91	9	5.1	5.6	5.0	4.6	4.7
CE308, Struct. Anal.; F91	15	5.1	5.1	4.8	4.6	4.6
CE416, Design of Struct. Syst.; S91	17	4.4	4.8	4.5	3.8	4.6
CE308, Struct. Anal.; S91	21	5.3	5.6	5.2	4.7	4.7
CE502, Finite Element Analysis; S91	12	5.6	5.6	5.6	4.5	4.6
CE202, Engineering Statics; F90	45	3.8	3.5	3.5	4.0	3.7
CE308, Struct. Anal; F90	12	4.9	5.0	4.3	4.7	4.4
CE518, Struct. Stab.; F90	9	5.1	4.7	5.1	4.1	4.7
CE202, Engineering Statics; Sum90	15	5.2	5.3	5.1	4.7	4.7
CE502, Finite Element Analysis; S90	13	4.8	4.8	4.9	4.3	4.6
CE416, Design of Struct. Syst.; S90	8	5.6	5.6	5.6	4.6	4.7
CE478, Dsgn. Tmp. Strct.; F89	13	4.7	4.7	4.5	3.9	4.1
CE491, Comp. Appl. in CE; F89	10	4.8	5.0	4.7	NA	NA
CE416, Design of Struct. Syst.; S89	12	NA	NA	NA	NA	NA

CE551, Adv. Topics in FEM; S89	4	NA	NA	NA	NA	NA
CE502, Finite Element Analysis; F88	17	5.1	5.2	5.1	4.4	4.7
CE491, Comp. Appl. in CE; F88	3	NA	NA	NA	NA	NA
CE551, Adv. Topics in FEM; S88	8	4.9	5.0	4.8	3.3	4.6
CE452, Comp. Appl. in CE; S88	6	5.0	5.3	5.0	4.7	4.7
CE502, Finite Element Analysis; F87	14	5.0	4.8	4.8	4.0	4.6
CE416, Design of Struct. Syst.; S87	7	4.3	5.6	4.3	4.6	4.6
CE324, Structural Steel Design; F86	8	4.5	5.6	5.2	5.0	4.6
CE502, Finite Element Analysis; F86	12	5.4	5.4	5.2	4.7	4.7

University, School, and Departmental Service

University Committees

Faculty Senate Research Policy Committee, 2009-20011

Faculty Senate Library Committee, 2005 - 2007

Computer Use Committee, 1993-1998

CIRT Site License Committee, 1993-2000

School of Engineering Committees

Member, Task Force for Hewlett-Packard Computer Proposal

Member, Task Force for Maui High Performance Computing Center Proposal

Member, Scientific and Engineering Computing Committee, 1996-present

Member, Minority Engineering, Math, and Science (MEMS) Committee

Member, SOE Computer Committee

Department of Civil Engineering Committees

Curriculum Committee, 2009 –

ABET Committee, 2009 -

Chair, Structures Faculty Search Committee, 2002-2003

Departmental Y2K Coordinator, 1999

Chair, Computer and Survey Committee, 1988-present

Chair, Library Committee, 1986-1987

Software Projects

CoMeT: a Computational Mechanics Toolkit.