

**Ronald Y.S. Pak**

Department of Civil, Environmental & Architectural Engineering  
University of Colorado, Boulder, CO 80309-0428

pak@colorado.edu  
(303) 492-8613 (office)  
(303) 492-7317 (fax)

**EDUCATION**

Ph.D., Applied Mechanics, 1985  
California Institute of Technology, Pasadena, California

M.S., Civil Engineering, 1980  
California Institute of Technology, Pasadena, California

B.E. (highest standing) , 1979  
McMaster University, Ontario, Canada

**ACADEMIC EXPERIENCE**

Professor of Civil Engineering (8/95 to now)  
University of Colorado at Boulder

Associate Professor of Civil Engineering (8/91 to 7/95)  
University of Colorado at Boulder

Assistant Professor of Civil Engineering (8/85 to 7/91)  
University of Colorado at Boulder

Research Fellow, Dept. of Civil Engineering (7/85 to 8/85)  
California Institute of Technology

**RESEARCH AREAS**

theory of elasticity	geotechnical earthquake engineering
theory of plasticity	soil-structure interaction
mechanics of porous media	wave propagation in granular materials
boundary elements methods	centrifuge experimental modeling
finite element analysis	earthquake simulation
applied mathematical methods	contact and impact mechanicsdynamics

**TEACHING AREAS**

elasticity and continuum mechanics	soil dynamics
soil mechanics foundation engineering	geotechnical engineering
analytical mechanics	applied geotechnical analysis

rigid-body dynamics

foundation engineering

## **INDUSTRIAL EXPERIENCE**

Associate Engineer, 3/81 to 6/82  
C F Braun & Co/Santa Fe International Corp., California

## **AWARDS AND HONORS**

NSF Presidential Young Investigator Award 1989

Departmental Service Award, Civil, Environmental & Architectural Engineering,  
University of Colorado 1996

Departmental Young Researcher Award, Civil, Environmental 1989  
& Architectural Engineering, University of Colorado

University of Colorado Junior Faculty Development Award 1986

Caltech Scholarships, Research & Teaching Assistantships 1982-85, 1979-81

Association of Professional Engineers Gold Medal, Ontario, Canada 1979

Association of Professional Engineers of Ontario Scholarships 1976-79

3-Years Academic Fees Scholarships, McMaster University 1976-79

Engineering Institute of Canada Prize 1976

Chancellor's Scholarship (1-year academic fees), McMaster University 1975-76

## **PROFESSIONAL AND HONOR SOCIETIES**

American Academy of Mechanics  
American Society of Civil Engineers (ASCE)  
American Society of Mechanical Engineers (ASME)  
American Men and Women of Science  
Who's Who in Engineering  
Who's who in Engineering Education

## **EDITORIAL BOARDS**

Journal of Engineering Mechanics, American Society of Civil Engineers (02-05)

ISRN Applied Mathematics Journal, International Scholarly Research Network (10-present)

## **PROFESSIONAL SCHOLARLY SERVICE**

### **Proposal Reviewer for:**

Division of Mechanics, Structures, and Material Engineering, National Science Foundation

Division of Critical Systems (Earthquake Hazard Mitigation), National Science Foundation

Division of Geomechanics and Building Systems, National Science Foundation

U.S. Army Research: European Research Office, Development & Standardization Group (UK)

Israeli Science Foundation

Research Grants Council (RGC) of Hong Kong

Croucher Foundation for Scientific Research, Hong Kong

### **Journal Reviewer for:**

Royal Society of London

Journal of Engineering Mechanics, American Society of Civil Engineers

Journal of Geotechnical Engineering, American Society of Civil Engineers

Journal of Structural Engineering, American Society of Civil Engineers

Journal of Applied Mechanics, American Society of Mechanical Engineers

Journal of Energy Resources Technology, American Society of Mechanical Engineers

Journal of Mechanics and Physics of Solids

Journal of Soils and Foundations, Japanese Society of Civil Engineers

International Journal of Earthquake Engineering and Structural Dynamics

International Journal of Soil Dynamics and Earthquake Engineering

International Journal of Engineering Science

International Journal of Solids & Structures

International Journal of Numerical and Analytical Methods in Geomechanics

International Journal of Nonlinear Mechanics

Quarterly Journal of Mechanics and Applied Mathematics

Soils and Foundations, Japanese Society of Civil Engineers

Engineering Structures Journal

Journal of Structural Engineering and Mechanics

American Society for Testing and Materials

Indian National Science Academy

Israel National Science Academy

Foundation Engineering Congress 1991 Proceedings, American Society of Civil Engineers

International Centrifuge Conference 1991 and 1994 Proceedings, International Society of Soil Mechanics and Foundation Engineering.

ISET Journal of Earthquake Technology

**Promotion and Tenure External Reviewer for:**

Faculty of Engineering, University of Manitoba, Winnipeg, Canada

Civil Engineering and Engineering Mechanics Department, Columbia University, New York

Civil Engineering and Mechanics Department, University of Wisconsin, Milwaukee

Civil and Environmental Engineering Department, Wayne State University, Michigan

Mechanical Engineering Department, Purdue University, Indiana

Civil Engineering Department, Hong Kong University of Science and Technology

Mechanical Engineering Department, University of British Columbia, Canada

Civil Engineering Department, National University of Singapore 05

Civil Engineering Department, Hong Kong University of Science and Technology 05

Civil Engineering Department, Washington State University 06

Civil Engineering Department, Drexel University 07

Division of Engineering, Colorado School of Mines 10

**Technical Committees:**

Chair, Elasticity Committee, Engineering Mechanics Division, American Society of Civil Engineers

Soil Dynamics Committee, Geotechnical Engineering Division, American Society of Civil Engineers

Dynamics Committee, Engineering Mechanics Division, American Society of Civil Engineers

Elasticity Committee, Applied Mechanics Division, American Society of Mechanical Engineers

Centrifuge Modeling Sub-committee, Transportation Research Board, National Research Council

**Organizing Committees:**

International Symposium on Elastic Wave Propagation & Ultrasonic Nondestructive Evaluation, International Union of Theoretical and Applied Mechanics, Boulder, Colorado, August 1989

Geotechnical Engineering Congress, American Society of Civil Engineers, Boulder, June 1991

10th Engineering Mechanics Conference, American Society of Civil Engineers, Boulder, May 1995

5th U.S. National Congress of Computational Mechanics, Boulder, June 1999

16th Engineering Mechanics Conference, American Society of Civil Engineers, Boulder, July 2003

17th Engineering Mechanics Conference, American Society of Civil Engineers, Boulder, May 2004

**Expert Panelists:**

NSF Experimental Geotechnical Earthquake Engineering Workshop, Albuquerque, New Mexico, November 1991

U.S. Geological Survey Workshop on Design of Soil-Structure Experiments, San Francisco, February 1992

NSF Workshop on Supercomputing, Visualization and Animation for Geotechnical Earthquake Engineering, Pittsburgh, November 1994

Symposium of Numerical and Physical Modeling of Soil-Structure Interaction, First Geo-Institute Conference, American Society of Civil Engineers, Utah, 1997

NSF Workshop, San Diego, 2001

NSF International Workshop on Earthquake Simulation in Geotechnical Engineering, Cleveland, 2001

International Symposium on Geotechnical Centrifuge Modelling and Networking, Hong Kong, 2001

Judging panel and chair, Computational Mechanics Student Paper Competition, EMI 2010 conference, Los Angeles. August 2010.

**Session Chairman, Organizer, Moderator:**

Insitu Testing Methods, ASCE Geotechnical Engineering Congress, Boulder, 1991

Dynamic Soil-Structure Interaction, 9th Engineering Mechanics Specialty Conference, American Society of Civil Engineers, Texas, May 1992

Dynamic Soil-Structure Interaction I, 10th Engineering Mechanics Specialty Conference, American Society of Civil Engineers, Boulder, May 1995

Dynamic Soil-Structure Interaction II, 10th Engineering Mechanics Specialty Conference, American Society of Civil Engineers, Boulder, May 1995

Symposium of Theoretical and Computational Geomechanics, Summer Joint Meeting of ASME, ASCE, SES, Evanston, June, 1997

Mini-Symposium "Seismic Wave Modeling and Its Engineering Applications," 4th International Conference on Mathematical and Numerical Aspects of Wave Propagation, Society of Industrial Applied Mathematics, Golden, June, 1998

Mini-Symposium "Advances in Boundary Element Methods," 5th  
U.S. National Congress of Computational Mechanics, Boulder, June, 1999

4 technical sessions on "Soil Dynamics and Liquefaction,"  
GeoDenver, Geo-Institute, ASCE, August, 2000

Elasticity Methods in Geomechanics I and II, 16th Engineering Mechanics Conference,  
American Society of Civil Engineers, Seattle, July 2003

Elasticity Methods in Geomechanics I and II, 17th Engineering Mechanics Conference,  
American Society of Civil Engineers, Delaware, June 2004

Elasticity and Boundary Element Methods I, II and III, McMat 05Joint  
ASME/ASCE/SES Mechanics and Materials Conference, Baton Rouge, Louisiana, June  
2005

Mindlin Symposium, 15<sup>th</sup> US National Congress of Theoretical and Applied Mechanics,  
Boulder, June 2006

18th Engineering Mechanics Conference, University of Minnesota, 2008.

19<sup>th</sup> Engineering Mechanics Conference, VPI, 2009.

Chair and judge panelist, Computational Mechanics Student Paper Competition, EMI  
2010 conference, Los Angeles. August 2010.

Chair, Elasticity I: Engineering Adaptations of Elasticity and Wave Propagation I and II  
EMI 2010 conference, Los Angeles. August 2010.

Chair, Elasticity II: Theoretical Elasticity and Mathematical Methods EMI 2010  
conference, Los Angeles. August 2010.

**Invited Speaker:**

NSF Centrifuge Modelling for Geotechnical and Earthquake Engineering Applications  
Workshop, Troy, New York, July 1992

29th International Society of Engineering Science Conference, San Diego, September  
1992

Invited Speaker, Civil Engineering Department, Kyoto University, Japan, June 1995

Invited Speaker, Civil Engineering Department, Nagoya University, Japan, June 1995

Invited Speaker, Civil Engineering Department, Kanazawa University, Japan, July 1995

Symposium of Theoretical and Computational Geomechanics, Summer Joint Meeting of ASME, ASCE, SES, Evanston, June, 1997

Mini-Symposium "Seismic Wave Modeling and Its Engineering Applications," 4th International Conference on Mathematical and Numerical Aspects of Wave Propagation, Society of Industrial Applied Mathematics, Golden, June, 1998

Mini-Symposium "Advances in Boundary Element Methods," 5th U.S. National Congress of Computational Mechanics, Boulder, June, 1999

Leading sessions on "Soil Dynamics and Liquefaction," GeoDenver, Geo-Institute, ASCE, August, 2000

NSF International Workshop on Earthquake Simulation in Geotechnical Engineering, Case Western Reserve University, November, 2001

International Symposium on Geotechnical Centrifuge Modelling and Networking, Hong Kong, December, 2001

Distinguished Speaker, Annual Meeting of Hong Kong Society of of Theoretical and Applied Mechanics, City University of Hong Kong, June, 2005

Invited Speaker, Civil Engineering Department, Kyoto University, Japan, July, 2005

Mindlin Symposium, 15<sup>th</sup> USNCTAM, June 2006

**Advisory Board:**

7th Annual ICCE/7 International Conference on Composite Engineering, Denver July 2-8, 2000

CUREE Board of Directors 04-06

CUREE Universit Representative 04-present

**Short-Course Lecturer:**

International Short Course on Earthquake Engineering and Soil Dynamics, Cairo, Egypt, December 1993 (2 weeks)

Short Course on Analytical and Experimental Methods in Soil Dynamics, Boulder, July 1994 (3 days)

Short Course on Soil Dynamics, Boulder, Fall 1995



## **UNIVERSITY SERVICE**

### **1) Department of Civil, Environmental, and Architectural Engineering:**

Executive Committee for Departmental Administration (93-96, 98-00, 10-present)

Faculty mentor of Franck Vernerey (2010-), Rich Regueiro (05-)

Geotechnical Engineering and Geomechanics Group coordinator (10-)

Program Director and Developer, Undergraduate Engineering Science Track (06-present)

Program Director and Developer, Graduate Engineering Science Program (08-present)

Curriculum Committee (06-10, Chair 08-10)

Search Committee for Geotechnical Engineering Faculty (06-07, 09-10)

Search Committee for Structural Engineering Faculty in Earthquake Engineering (04-05, 05-06)

Search Committee for Geotechnical Engineering Faculty (Chair 03-04)

Search Committee for Geotechnical Engineering Faculty (97-98)

Search Committee for two Faculty in Structural Materials and Architectural Engineering (Chair 95-96)

Search Committee for Faculty in Water Resources (99-00)

Joint Evaluation Committee, Geotechnical Curriculum review (05)

CU NEES FHT-Site Internal Advisory Board (05-07)

Chair and Graduate Program Director (98-02)

Co-Chair, CEAE Murphy Chair Selection Committee (99-00)

Personnel Committee (95-present)

CU Boulder-CU Denver Coordinated Ph.D. Program Committee (98-present)

University Program Review Self-Study Committee (94-95)

Department Chair Search Committee (90-91)

Distinguished Faculty Search Committee (91-92)

Curriculum Committee (95-96)

Operations Committee (90-91, 94-95, 03-04)

Undergraduate Committee (91-92)

Teaching Committee, Chair (91-92)

Faculty Group Evaluation Committee (90-91)

Departmental Computer Committee (85-90)

Instructional Software Committee (87-present)

Geotechnical Software Coordinator (88-present)

**2) College of Engineering and Applied Science:**

Vice Chancellor's Engineering Dean Search Committee (00-01)

College First Level Tenure-Promotion Review Committee (98-01)

College Post-tenure Review Committee (96-97)

Undergraduate Academic Affairs Committee (92-95)

Center for Acoustics, Mechanics and Materials (93-96)

Engineering Library Committee (88-present)

Faculty Preceptor for Engineering Freshmen (89-90)

High School Honor Institute Seminar Speaker (94)

Freshman Orientation Speaker on Civil Engineering Curriculum (94)

**3) University of Colorado, Boulder Campus:**

Undergraduate Research Opportunity Program (UROP) Advisor (90-97, 05-06)

University Research Misconduct Committee (00-06)

3 Research Misconduct Inquiry Subcommittees (05-06)

CU Campus International Task Force and China Initiative (05-07)

### **CONSULTATION AND PROFESSIONAL SERVICE**

Resonant Machine Inc., Oklahoma

U.S. Bureau of Reclamation

U.S. Agency for International Development

Taiwan Provincial Water Conservancy Bureau

### **MAJOR RESEARCH GRANTS**

Title: A GAANN Interdisciplinary Research Fellowship Program in Civil Engineering

Period: August 2006 - August 2011

Source: Department of Education

Amount: \$ 791,700

Position: sole P.I

Agency: Sangji University, Korea

Title: Performance Evaluation of Rockfall Prevention Facilities

Period: Feb 2010 - Dec 2010

Amount: \$ 20,000.

Position: sole P.I

Title: Advanced Engineering Frameworks for Dynamic Foundation Interaction with Granular Soils under Multi-Directional Loads

Period: October 2002 – March 2005

Source: National Science Foundation

Amount: \$ 295,276

Position: sole P.I.

Title: Research Experience for Undergraduates: Dynamic Foundation Modeling

Period: June 2004 – June 2005

Source: National Science Foundation

Amount: \$ 6,800

Position: sole P.I.

Title: Development of a Flexibase Container for Differential Ground Motion Simulation

Period: June 2003 – May 2004

Source: National Science Foundation

Amount: \$ 92,187

Position: sole P.I.

Title: A GAANN Interdisciplinary Research Fellowship Program in Civil Engineering

Period: August 2001 - August 2004

Source: Department of Education

Amount: \$ 529,818                      Position: sole P.I

Title: Physical Modeling of Dynamic Behavior of Piles and Pile Groups

Period: May 1999 - September 2002

Source: National Science Foundation

Amount: \$ 202,500                      Position: sole P.I.

Title: Research Experience for Undergraduates: Seismic Foundation Interaction

Period: October 2000 - September 2002

Source: National Science Foundation

Amount: \$ 12,000                      Position: sole P.I.

Title: Dynamic Characterization of Shallow Foundations

Period: October 1994 - September 1998

Source: National Science Foundation

Amount: \$ 213,409                      Position: P.I.

Title: A Computational Platform for Dynamic Soil-Foundation Interaction

Period: October 1993 - September 1995

Source: Air Force Office of Scientific Research

Amount: \$ 25,000                      Position: P.I.

Title: Presidential Young Investigator Award (PYI)

Period: October 1989 - September 1994

Source: National Science Foundation

Amount: \$ 312,500                      Position: P.I.

Title: Industrial Matching Funds for PYI Award

Period: October 1989 - September 1994

Source: Chevron USA, Bechtel Intl. Inc., Fluor-Daniel Inc., Resonant Machine Inc., Sun Microsystems Inc., Tektronix Inc.

Amount: \$ 187,500                      Position: P.I.

Title: Modeling of Building Foundation Response to Earthquake Ground Motion using a Geotechnical Centrifuge

Period: September 1988 - March 1991

Source: National Science Foundation

Amount: \$ 199,950                      Position: P.I.

Title: Dynamic Response of an Axially-Loaded Pile: a Theoretical and Experimental Investigation

Period: December 1986 - May 1989

Source: National Science Foundation

Amount: \$ 154,357                      Position: P.I.

Title: Seismic Study of Tall Counterforted Retaining Walls

Period: January 1994 - October 1994  
Source: U.S. Bureau of Reclamation  
Amount: \$ 66,000 Position: Co-P.I.

Title: Verification of Numerical Procedures for Soil Liquefaction (VELACS)  
Period: January 1992 - June 1993  
Source: National Science Foundation  
Amount: \$ 23,000 Position: Co-P.I.

Title: Research Experience for Undergraduates: Soil-Structure Interaction  
Period: August 1993 - December 1996  
Source: National Science Foundation  
Amount: \$ 15,000 Position: P.I.

### **BOOK EDITORSHIP**

Pak, R.Y.S. and Yamamura, J., *SOIL DYNAMICS AND LIQUEFACTION 2000*, Geotechnical Special Publication No. 107, Geo-Institute, American Society of Civil Engineers, 2000, 208 pages.

### **REFEREED JOURNAL PUBLICATIONS**

1. Pak, R.Y.S., "Asymmetric Wave Propagation in an Elastic Half-Space by a Method of Potentials," *Journal of Applied Mechanics*, American Society of Mechanical Engineers, Vol. 54, March 1987, pp. 121-126.
2. Pak, R.Y.S. and Jennings, P.C., "Elastodynamic Response of Pile under Transverse Excitations," *Journal of Engineering Mechanics*, American Society of Civil Engineers, Vol. 113, No. 7, July 1987, pp. 1101-1116.
3. Pak, R.Y.S., "On the Flexure of a Partially Embedded Bar under Lateral Loads," *Journal of Applied Mechanics*, American Society of Mechanical Engineers, Vol. 56, No. 2, June 1989, pp. 263-269.
4. Tamura, T. and Pak, R.Y.S., "Rigid-Plastic Limit Analysis of Discontinuous Media by a Finite Element Method," *Canadian Geotechnical Journal*, Vol. 26, No. 3, August 1989, pp. 369-374.
5. Pak, R.Y.S. and Gobert, A.T., "On the Axisymmetric Interaction of a Rigid Disc with a Semi-Infinite Solid," *Journal of Applied Mathematics and Physics (ZAMP)*, Vol. 41, September 1990, pp. 684-700.
6. Pak, R.Y.S. and Saphores, J.-D., "Torsion of a Rigid Disc in a Half-Space," *International Journal of Engineering Science*, Vol. 29, No. 1, January 1991, pp. 1-12.

7. Pak, R.Y.S. and Saphores, J.D., "Rocking Rotation of a Rigid Disc in a Half-Space," *International Journal of Solids and Structures*, Vol. 28, No. 3, 1991, pp. 389-401.
8. Pak, R.Y.S. and Saphores, J.-D., "On the Response of a Partially Embedded Rod to Axial Load," *Journal of Applied Mechanics*, American Society of Mechanical Engineers, Vol. 58, No. 2, 1991, pp. 599-602.
9. Pak, R.Y.S. and Gobert, A.T., "Forced Vertical Vibration of Rigid Discs with Arbitrary Embedment," *Journal of Engineering Mechanics*, American Society of Civil Engineers, Vol. 117, No. 11, 1991, pp. 2527-2548.
10. Pak, R.Y.S. and Abedzadeh, F., "Torsional Traction on an Open Finite Cylindrical Cavity," *Proceedings of Royal Society of London, Series A: Mathematical and Physical Sciences*, Vol. 438, 1992, pp. 133-144.
11. Pak, R.Y.S. and Saphores, J.-D., "Lateral Translation of a Rigid Disc in a Semi-Infinite Solid," *Quarterly Journal of Mechanics and Applied Mathematics*, Vol. 45, Pt. 3, 1992, pp. 435-449.
12. Pak, R.Y.S. and Ji, F., "Rational Mechanics of Axial Soil-Pile Interaction," *Journal of Engineering Mechanics*, American Society of Civil Engineers, Vol. 119, No. 4, 1993, pp. 813-832.
13. Pak, R.Y.S. and Abedzadeh, F., "Forced Torsional Oscillation from the Interior of a Half-Space," *Journal of Sound and Vibration*, Vol. 160, No. 3, 1993, pp. 401-415.
14. Pak, R.Y.S. and Gobert, A.T., "Axisymmetric Problems of a Partially Embedded Rod with Radial Deformation," *International Journal of Solids and Structures*, Vol. 30, No. 13, 1993, pp. 1745-1759.
15. Pak, R.Y.S. and Ji, F., "Axisymmetric Stress-Transfers from an Embedded Cylindrical Shell to a Half-Space," *Proceedings of Royal Society of London, Series A: Mathematical and Physical Sciences*, Vol. 441, 1993, pp. 237-259.
16. Pak, R.Y.S. and Stauffer, E., "Nonlinear Finite Deformation Analysis of Beams and Columns," *Journal of Engineering Mechanics*, American Society of Civil Engineers, Vol. 120, No. 10, 1994, pp. 2136-2153.
17. Pak, R.Y.S. and Ji, F., "Mathematical Boundary Integral Equation Analysis of an Embedded Shell under Dynamic Excitations," *International Journal for Numerical Methods in Engineering*, Vol. 37, No. 14, 1994, pp. 2501-2520.
18. Guzina, B.B., Rizzi, E., Willam, K. and Pak, R.Y.S., "Failure Detection of Smeared Crack Formulation," *Journal of Engineering Mechanics*, American Society of Civil Engineers, Vol. 121, No. 1, 1995, pp. 150-161.

19. Pak, R.Y.S. and Guzina, B.B., ``Dynamic Characterization of Vertically - Loaded Foundations on Granular Soils," *Journal of Geotechnical Engineering*, American Society of Civil Engineers, Vol. 121, No. 3, 1995, pp. 274-286.
20. Abedzadeh, F. and Pak, R.Y.S., ``Horizontal Translation and Rocking Rotation of a Rigid Embedded Tubular Foundation," *Geotechnique*, Vol. 45, No. 1, 1995, pp. 83-94.
21. Pak, R.Y.S. and Guzina, B.B., ``Three-Dimensional Wave Propagation Analysis of a Smoothly Heterogeneous Solid," *Journal of Mechanics and Physics of Solids*, Vol. 43, No. 4, 1995, pp. 533-551.
22. Pak, R.Y.S. and Abedzadeh, F., ``A Torsional Contact Problem for an Indented Half-Space," *Journal of Applied Mechanics*, American Society of Mechanical Engineers, Vol. 63, No. 1, 1996, pp. 1-6.
23. Guzina, B.B. and Pak, R.Y.S., ``Elastodynamic Green's Functions for an Inhomogeneous Half-Space," *International Journal of Solids and Structures*, Vol. 33, No. 7, 1996, pp. 1005-1021.
24. Ji, F. and Pak, R.Y.S., ``Scattering of Vertically-Incident P-Waves by an Embedded Pile," *Journal of Soil Dynamics and Earthquake Engineering*, Vol. 15, No. 3, 1996, pp. 211-222.
25. Guzina, B.B. and Pak, R.Y.S., ``Vertical Vibration of a Circular Footing on a Linear-Wave-Velocity Half-Space," *Geotechnique*, Vol 48 (2), 1998, pp. 159-168.
26. Guzina, B.B. and Pak, R.Y.S., ``Static Fundamental Solutions for a Bi-Material Full-Space," *International Journal of Solids and Structures*, Vol. 36, No. 4, 1998, pp. 493-516.
27. Pak, R.Y.S. and Guzina, B.B., ``Seismic Soil-Structure Interaction Analysis by Direct Boundary Element Methods," *International Journal of Solids and Structures*, Vol. 36, No. 31-32, 1999, pp. 4743-4766.
28. Dewoolkar, M.M., Ko, H.Y. and Pak, R.Y.S., ``Centrifuge Modeling of Models of Seismic Effects on Saturated Earth Structures," *Geotechnique*, Vol. 49, No. 2, 1999, pp. 247-266.
29. Dewoolkar, M.M., Ko, H.Y. and Pak, R.Y.S., ``Experimental Developments for studying Static and Seismic Behavior of Retaining Walls with Liquefiable Backfills," *Soil Dynamics and Earthquake Engineering*, Vol. 19, 2000, pp. 583-593.

30. Guzina, B.B. and Pak, R.Y.S., "On the Analysis of Wave Motions in a Multi-Layered Solid," Quarterly Journal of Mechanics and Applied Mathematics, Vol. 54 (1), 2001, pp. 13-37.
31. Dewoolkar, M.M., Ko, H.Y. and Pak, R.Y.S., "Seismic Behavior of Cantilever Retaining Walls with Liquefiable Backfills," Journal of Geotechnical and Geoenvironmental Engineering, Vol. 127 (5), 2001, pp. 424-435
32. Pak, R.Y.S. and Guzina, B.B., "Three-Dimensional Green's Functions for a Multi-Layered Half-Space by Displacement Potentials," Journal of Engineering Mechanics, ASCE, Vol. 128 (4), 2002, pp. 449-461.
33. Abedzadeh, F. and Pak, R.Y.S. "Continuum Mechanics of Lateral Soil-Pile Interaction," Journal of Engineering Mechanics, ASCE, Vol. 140 (4), 2004, pp. 1309-1318.
34. Guzina, B.B., Pak, R.Y.S. and Martinez-Castro, A.E., "Singular Boundary Elements for Three-Dimensional Elasticity Problems," Engineering Analysis by Boundary Elements, 30 (8), 2006, pp. 623-639.
35. Pak, R.Y.S. and Ashlock, J.C., "Method of Adaptive-Gradient Elements for Computational Mechanics," Journal of Engineering Mechanics, ASCE, Vol. 133 (1), 2007, pp. 87-97.
36. Rahimian, M, Eskandari-Ghadi, M., Pak, R.Y.S. and Khojasteh, A. "An Elastodynamic Potential Method for a Transversely Isotropic Solid," Journal of Engineering Mechanics, ASCE, 133 (10), 2007. pp. 1134-1145.
37. Pak, R.Y.S. and Eskandari-Ghadi, M. and, "On the Completeness of a Method of Potentials in Elastodynamics," Quarterly of Applied Mathematics, AMS, **65**, 2007. pp. 789-797.
38. Pak, R.Y.S., Bethany M. Simmons and Ashlock, J.C., "Tensionless Contact of a Flexible Plate and Annulus with a Smooth Half-Space by Integral Equations," International Journal of Mechanical Sciences, 50, 2008, pp. 1004– 1011.  
<http://dx.doi.org/10.1016/j.ijmecsci.2008.02.011>
39. Eskandari-Ghadi, M., Pak, R.Y.S. and Azizollah Ardeshtir-Behrestaghi, "Transversely Isotropic Elastodynamic Solution of a Finite Layer on an Infinite Subgrade under Surface Loads" Soil Dynamics and Earthquake Engineering, Vol. 28 (12), 2008 986-1003.
40. Pak, R.Y.S., Ashlock, J.C. , Kurahashi, S., and Abedzadeh, F., "Parametric Gmax Sounding of Granular Soils by Vibration Methods," Geotechnique, 58 (7), 2008, 571–580.



41. Khojasteh, A., Rahimian, M, Eskandari-Ghadi and M., Pak, R.Y.S. "Asymmetric Wave Propagation in a Transversely Isotropic Half-Space in Displacement Potentials," *Int. J. Engrg. Science*, 46 (7), 690-710, 2008.
42. Eskandari-Ghadi, M. and Pak, R.Y.S., "A Unified Method of Potentials for Elastodynamics and Elastostatics for  $x_3$ -Convex Domains," *Journal of Elasticity*, 92, 2008, 187-194.
43. Khojasteh, A., Rahimian, M., Eskandari-Ghadi M., and Pak, R.Y.S. "Asymmetric Dynamic Green's Functions in a Two-Layered Transversely Isotropic Half-Space," *Int. J. Engrg. Mech.*, Vol. 134 (9), 2008, 777-787.
44. Khojasteh, A., Rahimian, M., Pak, R.Y.S. and Eskandari-Ghadi, M. "Three-Dimensional Dynamic Green's Functions in Transversely Isotropic Bi-Materials," *Int. J. Solids and Structures*, Vol. 45, (18-19), 2008, 4952-4972. (doi:10.1016/j.ijsolstr.2008.04.024).
45. Eskandari-Ghadi, M., Sture S., Pak R.Y.S., Ardeshir-Behrestaghi, A. "A Tri-material Elastodynamic Solution for a Transversely Isotropic Full-space," Vol. 46 (5), 2009, 1121-1133.
46. Morteza Eskandari-Ghadi, Ronald Y.S. Pak and Azizollah Ardeshir-Behrestaghi, Elastostatic Green's functions for an arbitrary internal load in a transversely isotropic bi-material full-space, *International Journal of Engineering Science*, Volume 47, Issue 4, April 2009, 631-641.
47. Dewoolkar, M.M., Chan, A.H.C., Ko, H.Y. and Pak, R.Y.S., "Finite Element Modeling of Seismic Effects on Retaining Walls with Liquefiable Backfills," *International Journal of Numerical and Analytical Methods in Geomechanics*, Vol. 33 (6), 2009, 791-816.
48. Ashlock, J.C. and Pak, R.Y.S., "Experimental Response of Piles in Sand under Compound Motion," *J. Geotech. and Geoenvironm Engrg.*, ASCE, 135, 6, 2009, 799-808.
49. Eskandari-Ghadi M, Pak RYS., "Axisymmetric Body-Force Fields in Elastodynamics of Transversely Isotropic Media," *Journal of Applied Mechanics*, ASME Vol. 76, 6, 2009, Art. 061016-1-5.
50. Katebi, A. A., Khojasteh, A., Rahimian, M., Pak, R. Y. S. "Axisymmetric interaction of a rigid disk with a transversely isotropic half-space," *International Journal for Numerical and Analytical Methods in Geomechanics*, Vol. 34, Issue: 12, 2010, 1211-1236 (DOI: 10.1002/nag.854).
51. Pak, R.Y.S. and Jeramy C. Ashlock , "A Fundamental Dual-Zone Continuum Theory for Dynamic Soil-Structure Interaction," *International Journal of Earthquake Engineering and Structural Dynamics*, 2010 (DOI: 10.1002/eqe.1075).

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14. Law, H., Pak, R.Y.S., Sture, S., Ko., H.-Y. and Yashima, A., ``Numerical Prediction of Model No. 11," Proceedings of International Conference on Verification of Numerical Procedures for Analysis of Soil Liquefaction Problems, Vol. 1, Balkema, Rotterdam, 1993, pp. 959-976.
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47. Pak, R.Y.S., Ashlock, J.C., Abedzadeh, F. and Turner, N. "Dynamic Hybrid-Mode Test of a Pile on a Centrifuge," Proceedings of International Conference on Physical Modelling in Geotechnics, 6<sup>th</sup> ICPMG (Ng, Zhang, Wang, Ed.s), Vol. 2, Taylor & Francis, London, August 2006, 1037-1042.
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50. A Fundamental Platform for Dynamic Soil-Structure Interaction by Linearized Theory, R. Pak and J. Ashlock, Joint ASCE/ASME/SES Conference on Mechanics and Materials (Mech09), Virginia Tech. June 2009.
51. Ashlock, J. C., and Pak, R. Y. S. (2010). "Application of Random Vibration Techniques to Resonant Column Testing," Proc. ASCE GeoFlorida 2010 Conf., Paper No. 750, February 2010.
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53. Pak, R.Y.S., Chandler D.M. and Mitchell, J.L. "Eccentric forced vibration of circular foundations on sand," EMI 2010 conference, Aug. 2010.
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55. Ashlock, J. C., and Pak, R. Y. S. An assessment of classical elastodynamic SSI solutions by field-scale testing, EMI 2010 conference, Aug. 2010.

## **TEACHING AND COURSE DEVELOPMENT**

Graduate Program Development in Soil Dynamics and Earthquake Engineering

Graduate Program Development in Material Mechanics

Course Development of CVEN 6595 Earthquake Engineering

Course Development of CVEN 5798 Soil Dynamics

Course Development of CVEN 5131 Continuum Mechanics and Elasticity

Course Development of Boundary Element Methods

Course Development of Mathematical Methods for Engineering

Development of the M.Y. Leung Computational Laboratory for Soils and Structures

Developer of Undergraduate Engineering Science Track in CEAE

Developer of Graduate Engineering Science Track in CEAE

## **STUDENT RESEARCH SUPERVISION**

### **A) GRADUATE RESEARCH:**

#### **I) PRINCIPAL ADVISOR FOR:**

##### **a) Research Thesis Completed:**

Ph.D. Soudkhah, M. Development of Engineering Continuum Model for Seismic Soil-Structure Interaction, Dec 10

Ph.D. Ashlock, J.C. Experimental and Theoretical Modeling of Dynamically Loaded Surface Foundations on Granular Soils, Dec 07

Ph.D. Guzina, B.B. Seismic Response of Foundations and Structures in Multilayered Media, May 96

Ph.D. Stauffer, E.J. Stability and Bifurcation of Nonlinear Elastic Structures, Nov. 93

Ph.D. Abedzadeh, F. Dynamic Analysis of Piles and Pile Groups: Theory and Applications, Aug. 93

Ph.D. Ji, F. Boundary Element Method for Soil-Structure Interaction in Poroelasticity, May 93

Ph.D. Gobert, A.T. Dynamics of an Axially-Loaded Pile: Analysis and Experiment, Dec. 92

M.S. Chandler, D.W. Dynamic Response of Circular Foundations on Sand, Dec 2010

M.S. Simmons, B. M. Nonlinear Contact and Indenter Problems by One-Dimensional Integral Equations, June 06.



M.S. Kurahashi, S. Effects of Contact Pressure and Modulus Variation on Dynamic Foundation Behavior, May 02.

M.S. Sloan, J.A. Dynamic Loading of Shallow Foundations: Theory versus Experiment, Jun. 00

M.S. Ashlock, J.C. Experimental and Theoretical Modeling of Dynamically Loaded Surface Foundations on Granular Soils, Apr. 00

M.S. Gillmor, J.C. Centrifuge Modeling of Surface Foundations subject to Dynamic Loads, Dec. 99

M.S. Gjerapic, G. Torsional Vibrations of a Hollow Pile in Homogeneous && and Inhomogeneous Media, Apr. 98

M.S. Watkins, M. L. Static and Dynamic Behavior of Retaining Walls and Reinforced Earth Slopes, Dec. 97

M.S. Brown, E.C. Centrifuge Modeling of Surface Foundations subject to Dynamic Loads, Nov. 95

M.S. Batchelor, C.L. Analysis and Computation of Seismic Soil-Structure Interaction Effects, Aug. 95

M.S. Guzina, B.B. Dynamic Behavior of Surface Foundations on Heterogeneous Soils, Aug. 92

M.S. Ksouri, I. Experimental Modeling of Dynamic Behavior of Pile Groups, Jan. 91

M.S. Saphores, J.-D.M. Some Topics in Embedded Foundations, July 89

M.S. Gobert, A.T. Static and Dynamic Responses of an Embedded Footing under Vertical Loads, Feb. 89

M.S. Boutaleb, M. A Study of Bounding-Surface Plasticity for Sand, May 1987

**b) Research Thesis in Progress:**

Ph.D. Ashlock, J.C. Computational and Experimental modeling of piles (06)

Ph.D. Ihara, S. Analytical and field studies of pier settlements (03)

II) CO-ADVISOR FOR:

Research Thesis Completed:

Ph.D. Law, H Simulation of Earthquake Ground Motions on a Centrifuge, Jan. 91

Ph.D. Dewoolkar, M. Liquefaction problems of retaining walls with saturated backfills, Jun. 1996

Ph.D. Stadler, A.T. Centrifuge modeling of retaining structures with dry soils, Jun. 1996

### III) POST-DOCTORAL AND RESEARCH ASSOCIATE SUPERVISION

Linhong Zhang, Professor, Kunming University of Science and Technology  
50 East Huancheng Road, Kunming, Yunnan 650051, P. R. China (8/10-7/11)

Soudkhah, M., Calibration and Synthesis of a Class of Engineering Continuum Models for Free-Field, Radiation and Scattering Problems in Earthquake Engineering (6/10-present)

Ashlock, J.C. University of Colorado, Hybrid Modeling of Foundation-Soil Interaction (07)

Abedzadeh, F., Ph.D., University of Colorado, Seismic Soil-Pile Interaction (00-05)

Kaneda, K., Ph.D., Nagoya University, Creep rupture, constitutive soil modeling, soil dynamics (99-00)

Guzina, B.B., Ph.D., University of Colorado, Seismic Modeling and Soil Dynamics (96-97)

Ji, F., Ph.D., University of Colorado, Boundary element methods for porous media (93-94)

Ohtsuka, A., Ph.D., Nagoya University, Slope stability and plasticity theory in geotechnical engineering (92-93)

Iizuka, A., Ph.D. Kanazawa University, Large deformation plasticity theory and finite element analysis for soils (90-91)

### IV) INTERNATIONAL RESEARCH COOPERATION

Professor M. Rahimian, Dept. of Civil Engineering, Tehran University

Professor M. Eskandari, Dept. of Engineering Science, Tehran University

## **B) UNDERGRADUATE RESEARCH**

- B.S. Wirth, Joshua (10-11)
- B.S. Bohn, Michael (10-11)
- B.S. Webb, William (07-08)
- B.S. Graham, Andrew (05-06)
- B.S. Siegfried, A. Centrifuge modeling (03)
- B.S. Turner, N. Centrifuge modeling (01-03)
- B.S. Ashlock, J. Lateral vibration of foundations (96)
- B.S. Gillmor, G. Experimental centrifuge modeling of footings (95)
- B.S. Kouri, J.G. Boundary element and Green's function analysis (94)
- B.S. Aden, D. Soil sample preparation methods (94)
- B.S. Van Egeren, Q. Study of chaotic vibrations (93)
- B.S. Batchelor, C.L. Green's function for a soil stratum (93)

**EXTERNAL UNIVERSITY COMMITTEE**

Ph.D. Dissertation Committee, Dept. of Civil engineering, University of Roorkee, India