K. K. "MURALEE" MURALEETHARAN

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EDUCATION: Ph.D., Civil Engineering, University of California, Davis, 1990
Dissertation: Dynamic Behavior of Earth Dams

M.S., Civil Engineering, University of California, Davis, 1987
Thesis: Level Ground Liquefaction and Settlement Analysis Using In Situ Properties

B.S. (First Class Honors), Civil Engineering, University of Peradeniya, Sri Lanka, 1983

REGISTRATION: Professional Engineer, California, since 1992, C 49464
Geotechnical Engineer, California, since 2002, GE 2566

HONORS/AWARDS:

- Kimmell-Bernard Chair in Engineering, July 2010.
- College of Engineering Alumni Teaching Award, Spring 2009.
- David Ross Boyd Professorship, University of Oklahoma, 2009.
- College of Engineering Alumni Teaching Award, Fall 2008.
- Elected as a Fellow of the American Society of Civil Engineers, August 2006.
- George W. Tauxe Outstanding Civil Engineering Professor (awarded by students), University of Oklahoma, 2005.
- President's Associates Presidential Professorship, University of Oklahoma, 2005.
- Invited participant at the National Research Council (NRC) workshop on Research Opportunities in Geoengineering conducted in relation to the NRC report on future research directions in geoengineering, Irvine, California, February 2004.
- Selected by NSF to be one of the eleven Site Visit Team Members to review the request for renewal from the Mid-America Earthquake Center (MAE). MAE Center was one of the three NSF Earthquake Engineering Research Centers (EERC) in U.S. with University of Illinois at

Urbana Champaign as the lead institution (6/19/01 - 6/22/01). Also served on the NSF MAE Center Site Visit Teams in 2002 and 2003.

- Served on the NSF Site Visit Teams for the Rensselaer Polytechnic Institute (RPI), and the University of California, Davis, Network for Earthquake Engineering Simulation (NEES) geotechnical centrifuge testing facilities, 2002.

- Selected by ASCE, Geo-Institute/NSF as one of the 13 U.S. researchers to attend an international research/education workshop in Australia and to visit 8 Australian universities/research institutes to establish research/education collaborations, November 2000.

- Williams Faculty Innovator Award (as a part of the Sooner City Faculty Team), Oklahoma State Regents for Higher Education, June 2000.

- Regents' Award for Superior Teaching, University of Oklahoma, 2000.

- Awarded a 1999 Regents Instructional Technology Excellence Award as a part of the Sooner City Faculty Team by the Oklahoma State Regents for Higher Education.

- College of Engineering Distinguished Lectureship Award (The Engineering Excellence Award), University of Oklahoma, 1998.

- Selected as a member of the NSF sponsored U.S. delegation to attend the Biot Conference on Poromechanics in Belgium, September 1998.

- Who's Who in the World, Marquis, 18th Edition (2001).

- Who's Who in America, Marquis, 54th Edition (2000).

- Who's Who in the South and Southwest, Marquis, 26th Edition (1999-2000).

- Outstanding People of the 20th Century, International Biographical Center, Cambridge, England (2000).

- National Science Foundation, CAREER Award, 1995.

- Junior Faculty Research Grant, University of Oklahoma, 1995.

- Nominated member of the national honor societies of PHI KAPPA PHI and CHI EPSILON.

- Earth Technology Corporation's Corporate Quality Award for Excellence, 1992.

- Regents of University of California fellowship in Civil Engineering, University of California, Davis, 1987/88.

- Earle C. Anthony fellowship in Civil Engineering, University of California, Davis, 1986/87.

- Non-resident tuition fee fellowship (Distinguished Scholar Award), University of California, Davis, 1985/86.

RELEVANT EXPERIENCE:

Professor, School of Civil Engineering and Environmental Science, University of Oklahoma (5/2005 – Present).

Associate Director, National Institute for Risk & Resilience, University of Oklahoma (7/2015 – Present)

Associate Professor, School of Civil Engineering and Environmental Science, University of Oklahoma (7/2000 – 4/2005).

Assistant Professor, School of Civil Engineering and Environmental Science, University of Oklahoma (8/1994 – 6/2000).

- *Courses Taught:* Introduction to Engineering, Engineering Computing, Introduction to Continuum Mechanics, Introduction to Soil Dynamics, Environmental Geotechnology, Foundation Engineering, Introduction to Finite Element Method, Advanced Finite Element Method, Advanced Soil Mechanics, Soil-Structure Interaction, Constitutive Modeling of Geomaterials, and Introduction to Dynamics for Architectural and Civil Engineers.

- *New Courses Introduced:* Environmental Geotechnology (a graduate-level course), Introduction to Continuum Mechanics (a Junior-level required undergraduate course), and Introduction to Dynamics for Architectural and Civil Engineers (a Junior-level required undergraduate course).

- *Technology in Learning Initiatives:* Lead Engineering Instructor/Coordinator for the College of Engineering's laptop pilot program in Fall 1996 and Spring 1997. For this pilot program twenty-four incoming engineering freshmen were selected and provided with laptop computers. Several freshmen-year courses were taught with the aid of laptops and wireless network in the classroom, namely classes in engineering, mathematics, and English. Coordinated the selection of students, scheduling of laptop classes in engineering, mathematics, and English, and student enrollment for Fall 1996 and Spring 1997. Served as a liaison between Engineering Computing Network (ECN), mathematics and English departments, advising center, and the students to successfully launch the pilot program. Taught the two engineering courses, Introduction to Engineering and Engineering Computing, for the pilot program in Fall 1996. Successful completion of the pilot program lead to the student-owned computer program being offered to approximately half of the incoming engineering freshmen (about 200 students) in Fall 1997 on a voluntary basis and to all engineering students as a requirement in Fall 1998. The pilot program was allowed to continue with a different group of students within the School of Civil Engineering and Environmental Science.

- *Sooner City Project:* A Co-PI for this NSF funded major curriculum reform project. This project introduces civil engineering students to design from day one and provides a unifying theme to the entire undergraduate civil engineering curriculum. For the project, incoming freshman are given a plat of undeveloped land that, by the time they graduate, is turned into a blueprint for certain segments of the city. Design tasks include all facets of the traditional civil engineering program. The project is unique in that it threads a common design theme throughout the curriculum, yet does so in a flexible, cost-effective manner that requires no change in the traditional sequencing of courses. This project won number of awards and was recognized by the national magazines such as the ASEE Prism and the Engineering Times, the National Society of Professional Engineers' (NSPE) monthly magazine.

- *Funded Projects:*

  <u>External: 32 Grants for $10,391,806 (Individual Credit $3,222,961)</u>

  32. "Fusion and Archival of Large Disparate Data Sets," Sandia National Laboratories, $50,000, 7/16 to 8/16 (PI with Drs. Jenkins-Smith and Silva, Individual Credit = 34%)

  31. "Overturning Forces at Bridge Abutments and the Interaction of Horizontal Forces from Adjacent Roadways: Phase III - Post-Repair Monitoring of Instrumented Bridges," Oklahoma Department of Transportation (ODOT), $103,882, 10/15 to 9/17 (PI with Drs. Miller and Floyd, Individual Credit = 40%)

  30. "Post-Earthquake Bridge Inspection Guidelines," Infrastructure Engineers, Inc., $102,212, 5/15 to 6/17 (with Dr. Harvey Jr. (PI), Individual Credit = 40 % credit).

  29. "Temperature Effects in Bridge Condition Evaluation and Capacity Rating in Oklahoma," Southern Plains Transportation Center (SPTC), $167,968, 11/14 to 10/16 (with Drs. Wang (PI) and White, Individual Credit = 35%).

  28. "Design of Integral Abutment Bridges in Extreme Climate," SPTC, $199,986, 8/14 to 7/16 (PI with Dr. Miller, Individual Credit = 50%).

  27. "Overturning Forces at Bridge Abutments and the Interaction of Horizontal Forces from Adjacent Roadways: Phase II - Pre- and Post-Repair Monitoring of SH-3 North Bridge over BNSF Railroad," Oklahoma Department of Transportation (ODOT), $132,398, 10/13 to 9/15 (PI with Drs. Miller and Floyd, Individual Credit = 40%).

  26. "Evaluation of the Enhanced Integrated Climatic Model for Modulus-Based Construction Specifications for Oklahoma Pavements," Oklahoma Transportation Center (OkTC) (subcontract to OSU), $84,999 total, 02/12 to 04/13 (OU PI with Dr. Zaman, Individual Credit = 50%)

  25. "Interpretation of In Situ Tests as Affected by Soil Suction," OkTC, $80,000, 10/11 to 12/12 (with Drs. Miller (PI) and Cerato, Individual Credit = 33%)

24. "Interpretation of In Situ Tests as Affected by Soil Suction," ODOT, $266,226, 10/11 to 9/14 (with Drs. Miller (PI) and Cerato, Individual Credit = 33%)

23. "Evaluation of Enhanced Integrated Climatic Model for Oklahoma Pavements," ODOT (subcontract to OSU), $80,000, 10/11 to 9/13 (OU PI with Dr. Zaman, Individual Credit = 50%).

22. "Overturning Forces at Bridge Abutments and the Interaction of Horizontal Forces from Adjacent Roadways," ODOT, $357,299, 10/10 to 9/13 (PI with Dr. Miller, Individual Credit = 50%).

21. "NEESR-SG: Understanding and Improving the Seismic Behavior of Pile Foundations in Soft Clays," NSF, $1,182,411, 10/08 to 9/13 (PI with Drs. Miller and Cerato, Individual Credit = 50%).

20. "Cooperative Agreement with DOD ERDC on Magazine Safety," U.S. Department of Defense, Army Corps of Engineers, $104,000, 9/08 to 8/10 (with Drs. Mish (PI), Baldwin, Ramseyer, and Kang, Individual Credit = 15%).

19. "Soil-Structure Interaction Studies for Understanding the Behavior of Integral Abutment Bridges," OkTC, $296,836, 8/08 to 7/11 (PI with Drs. Miller and Mish, Individual Credit = 40%).

18. "Computer Simulation Tools for Multiphase Porous Media," Oklahoma Center for the Advancement of Science & Technology (OCAST), $297,554, 2/08 to 1/11 (PI with Dr. Abousleiman, Individual Credit = 50%).

17. "Field Performance Monitoring and Modeling of Instrumented Pavement on I-35 in McLain County," ODOT, $388,292, 10/06 to 9/12, (with Dr. Zaman (PI), Individual Credit = 33%)

16. "Work Program for FY05 OTC Appropriation Through FHWA: Turner Fairbanks Research Center," U.S. DOT, $1,155,000, 9/06 to 9/08 (with Drs. Zaman (PI), Mish, Court, Pulat, Shen, O'Rear, Ramseyer, and Hatami; Individual Credit = 9%).

15. "Protecting Oklahoma Transportation Infrastructure from Natural and Man-Made Hazards," Oklahoma Transportation Center, $125,000, 3/05 to 9/06 (with Dr. Mish (PI); Individual Credit = 50%)

14. "A Comprehensive Approach to Modeling the Stress-Strain Behavior of Unsaturated Soils for Geohazard Mitigation," NSF, $188,058, 9/03 to 8/06 (PI, with Drs. Miller and Wei; Individual Credit = 40%).

13. "Doctoral Fellowships in Sustainable Technologies for Civil and Environmental Systems," U.S. Dept. of Education, GAANN Award, $1,002,839 ($694,176 DoEd + $308,663 OU Match), 9/03 to 8/06 (with Drs. Kolar (PI), Butler, Miller, Mish, Knox,

Sabatini, Zaman, Nairn, Nanny, Nelson, Strevett, Kibbey, Pei, and Vieux; Individual Credit = 2%).

12. "ITR/AP (ENG): A Framework-Based Finite Element Approach to Solving Current and Future Multi-physics Problems in Geomaterials," NSF-Information Technology Research (ITR), $407,500, 9/01 to 8/04 (PI; Individual Credit = 100%).

11. "A Constitutive Model for Dynamic Behavior of Multiphase Porous Media," Lawrence Livermore National Laboratory (LLNL), $55,245 ($40,000 LLNL + $15,245 OU Match), 08/01 to 07/02 (PI; Individual Credit = 100%).

10. "Acquisition and Development of Equipment for Unsaturated Soil Research," NSF/MRI, $530,274 ($368,778 NSF + $161,496 OU Match), 7/00 to 6/02 (with Drs. Miller (PI), Kibbey, Zaman, Sabatini, Mooney, Kolar, and Knox; Individual Credit = 20%).

9. "Research Experience for Undergraduates in Geo-Environmental Systems," NSF/REU Site, $572,784 ($462,685 NSF + $110,099 OU Match), 3/00 to 2/05 (with Drs. Kolar (PI), Butler, Miller, Nairn, Zaman, Sabatini, Nanny, Strevett, Nelson, Mooney, Vieux, Kibbey, and Knox; Individual Credit = 5%).

8. "Settlement of Compacted Fill Embankments," State of Oklahoma, Department of Transportation, $83,944 ($80,944 ODOT + $3,000 OU Match), 5/99 to 4/01 (with Drs. Miller (PI) and Zaman; Individual Credit = 25%).

7. "Sooner City - Design Across the Curriculum," NSF/Action Agenda for Systemic Engineering Education Reform, $864,319 ($750,000 NSF + $114,319 OU Match), 9/98 to 8/01 (with Drs. Kolar (PI), Fink, Gramoll, Miller, Mooney, Sabatini, and Vieux; Individual Credit = 17%).

6. "Interpretation of In Situ Tests in Unsaturated Soil," NSF, $221,870 ($206,870 NSF + $15,000 OU Match), 9/98 – 8/01 (with Dr. Miller (PI); Individual Credit = 50%).

5. "Chemicals in the Environment - Doctoral Fellowships in Environmental Engineering and Science," U.S. Dept. of Education, GAANN Award, $751,530 ($601,224 DoEd + $150,306 OU Match), 8/98 - 8/01 (with Drs. Knox (PI), Canter, Kolar, Sabatini, Everett, Zaman, Kukreti, Meo, Nairn, Nanny, Nelson, Strevett, and Vieux; Individual Credit = 5%).

4. "TLC Design: Integrating Team Learning, Computing, and Design in Undergraduate Engineering Education," NSF/CCD, $128,000 ($118,000 NSF + $10,000 OU Match), 3/97 - 2/99 (with Drs. Kolar (PI), Gruenwald, Mooney, and Vieux; Individual Credit = 20%).

3. "Modeling the 85th Percentile Speed on Oklahoma Two-Lane Rural Highways: A Neural Net Approach," Oklahoma Department of Transportation, $39,787, 1/97 - 7/98 (with Dr. Zaman (PI); Individual Credit = 20%).

2. "Static and Dynamic Behavior of Unsaturated Soils - Theory and Validation," NSF-CAREER Award, $309,980 ($300,000 NSF + $9,980 OU Match), 8/95 - 7/01 (PI; Individual Credit = 100%).

1. "Field Evaluation of Drainable Bases in Oklahoma," State of Oklahoma, Oklahoma Department of Transportation, $61,613, 1/95 - 9/96 (with Drs. Zaman (PI) and Laguros; Individual Credit = 24%).

Internal (4 for $51,867)

4. "Automated Triaxial Testing System for Unsaturated Soils," OU-Vice President for Research (Research/Creative Activity Equipment/Facilities Funds), $27,000, 11/97 (PI, with Drs. Mooney, Miller, and Zaman).

3. "Multimedia Courseware for Design Oriented Engineering Education," OU - Provost's Office, $13,867, 7/96-6/97 (PI, with Drs. Kolar, Mooney, and Gruenwald).

2. "Equipment for Determining the Electric Behavior of Soils," University Research Council, $6,000, 10/95 (with Drs. Miller (PI) and Zaman).

1. "Development of A Non-Linear Fully-Coupled Analysis Procedure for Unsaturated Soils," Junior Faculty Research Program, $5,000, 5/95-6/95 (PI).

- *Computer Codes Developed:*

  DYSAC2 (Dynamic Soil Analysis Code for 2-dimensional problems): A fully coupled, nonlinear, dynamic finite element code for the analysis of soil structures subjected to earthquake loading (with Drs. Mish, Yogachandran, and Arulanandan).

  U_DYSAC2: Unsaturated Dynamic Soil Analysis Code for 2-dimensional problems (with Dr. Wei).

  TeraDysac: The three-dimensional parallel version of the fully coupled soil analysis code developed in collaboration with the ANATECH Corp. (TeraScale Division), New Mexico (with Dr. Ravichandran and Dr. Taylor).

- *Invention Disclosures*:

  "A Methodology to Predict Type of Fluid Content, Degree of Saturation, and Structure in Rocks Using Stress Wave Measurements," Filed with the Office of Technology Development, University of Oklahoma, April 2004 (with Dr. Wei).

- *Consulting:*

  Pier 400 Design Consultants, Long Beach, California and Port of Los Angeles: Seismic analyses of Pier 400 (see the attached figure) using the computer code DYSAC2.

  Caltrans (California Department of Transportation) through University of California, Davis: Seismic analysis of the Vincent Thomas Bridge site using the computer code DYSAC2.

- *Graduate Student Supervision:*

  Ph.D. Dissertation: 8 completed

  Soltani, H. (2016). "Development of Soil-Pile Interaction Models in Improved Soils Using Centrifuge Test Data and System Identification Methods." May (current position: **Staff Researcher**, Center for Intelligent Transportations Systems, *University of Oklahoma*, Norman, Oklahoma)

  Taghavi, A. (2015). "Seismic and Quasi-Static Lateral Load Behavior of Pile Groups in Improved Soft Clay: Centrifuge and Numerical Modeling." December (current position: **Research Associate**, Bridge Software Institute, *University of Florida*, Gainesville, Florida)

  Kirupakaran, K. (2013). "Soil-Structure Interaction Studies for Understanding the Behavior of Integral Abutment Bridges." May (current position: **Geotechnical Engineer**, *NTH Consultants*, Cleveland, Ohio).

  Krier, D.M. (2009). "Modeling of Integral Abutment Bridges Considering Soil-Structure Interaction Effects." May (current position: **Naval Aviator**, *U.S. Navy*).

  Liu, C. (2009). "A Coupled Hydraulic-Mechanical Elastoplastic Constitutive Model for Unsaturated Sands and Silts." May (former position: **Assistant Professor**, *University of South Carolina*, Columbia, South Carolina).

  Ravichandran, N. (2005). "A Framework-based Finite Element Approach to Solving Large Deformation Problems in Multi-phase Porous Media." December (current position: **Associate Professor**, *Clemson University*, Clemson, South Carolina).

  Yang, Y. (2003). "The Middle Surface Concept and Its Application to Constitutive Modeling of Soils." November (current position: **Lecturer**, *University of Nottingham Ningbo - China*, Ningbo, China).

  Wei, C.-F. (2001). "Static and Dynamic Behavior of Multiphase Porous Media: Governing Equations and Finite Element Implementation." December (nominated by the Department for the university-wide best dissertation award, current position: **Professor**, *Institute of Rock and Soil Mechanics, Chinese Academy of Sciences*, Wuhan, China and

Dean, College of Civil and Architectural Engineering, Guilin University of Technology, Guilin, China).

M.S. Thesis: 16 completed

Quiroga, A.J. (2013). "Modeling of Pile Foundations in Unimproved and Cement-Improved Soft Clays: Laboratory Testing and Field Validation." December.

Bright, Z.P. (2012). "Bridge Instrumentation to Study Horizontal Forces from Adjacent Roadways." December (co-advisor Dr. Miller).

Thompson, Z.M. (2011). "Stress-Strain Behavior of Unimproved and Cement-Improved Soft Clays." December.

Breidy, M. (2011). "Development of a Field-Based Fatigue Transfer Function for a Flexible Pavement Section on I-35 in Oklahoma." December.

Kirupakaran, K. (2011). "Finite Element Modeling of Borehole Stability in Poroelastoplastic Media." May.

Champirat, S. (2007). "An Intelligent Decision Making Tool for the Rapid Assessment of Subsurface Contamination." National Research Center in Environmental and Hazardous Waste Management (NRC-EHWM), Chulalongkorn University, Bangkok, Thailand, May (co-advisor Dr. Weschayanwiwat).

Wattanamekhinkul, V. (2006). "The Linked GIS and Groundwater Model: A Case Study of an Abandoned Landfill in Chonburi Province." National Research Center in Environmental and Hazardous Waste Management (NRC-EHWM), Chulalongkorn University, Bangkok, Thailand, May (co-advisor Dr. Osathaphan).

Chinratanapisit, I. (2005). "Validation of Contaminant Transport Process Using MODFLOW and Centrifuge Model Test Results." National Research Center in Environmental and Hazardous Waste Management (NRC-EHWM), Chulalongkorn University, Bangkok, Thailand, May (co-advisor Dr. Khaodhiar).

Vinayagam, T. (2004). "Understanding the Stress-Strain Behavior of Unsaturated Minco Silt Using Laboratory Testing and Constitutive Modeling." December.

Manonukul, A. (2004). "Modeling Dense Non-Aqueous Phase Liquid (DNAPL) Transport through Saturated Porous Media." National Reserch Center in Environmental and Hazardous Waste Management (NRC-EHWM), Chulalongkorn University, Bangkok, Thailand, April (co-advisor Dr. Osathapan).

Varatharaj, S. (2001). "A Fully Coupled Analysis Procedure for Dynamic Soil-Structure Interaction During Seismic Events." June.

Alam, A. (1999). "A Neural Network Model for Pavement Drainage Systems: Parametric Study and Design Application." April (co-advisor Dr. Zaman).

Granger, K. K. (1998). "The Use of Miniature Pore Pressure Transducers in Measuring Matric Suction in Soils." December.

Nedunuri, P. R. (1998). "A Bounding Surface Elastoplastic Constitutive Model for Monotonic and Cyclic Behavior of Unsaturated Soils." June.

Deshpande, S. (1997). "Static and Dynamic Centrifuge Modeling of Unsaturated Soil Embankments." December.

Rahman, M. (1996). "Evaluation of Pavement Drainage Systems Based on Field Performance." June (co-advisor Dr. Zaman).

M.S. Non-thesis: 3 completed

Varghese, S. (1996), Krier, D.M. (2006), Jones, M. (2008)

Lecturer (part-time), Department of Civil Engineering, University of California, Irvine (1/1993 - 8/1994). Taught graduate level courses on Geotechnical Earthquake Engineering and Physicochemical and Stress-Strain Behavior of Soils.

Staff, Senior Staff, Project, and Senior Project Engineer, Earth Tech, Irvine, Long Beach, Huntington Beach, and San Bernardino (8/1988 - 8/1994).

Key Projects:

- Lead engineer for the Port of Los Angeles/Pier 400 project. This project involved creation of approximately 580 acres of new land by dredging and backfilling behind rock dikes. Planned, coordinated and directed a dynamic centrifuge testing program for the purpose of providing insights into potential deformation mechanisms of dike retaining structures and data for the validation of the computer code, DYSAC2. Performed dynamic finite element analyses of centrifuge model tests and Pier 400 cross sections.

- Lead engineer for the coordination as well as static and dynamic laboratory testing of soils for the VELACS project, a NSF funded geotechnical centrifuge study of simulated earthquake loading of a variety of different models performed by a 7-university consortium.

- Planned and coordinated a field investigation program after the 1989 Loma Prieta earthquake in the San Francisco Marina District. Performed non-linear site response analyses with DYSAC2 computer code using input properties representative of in situ conditions.

- Planned, coordinated and performed geotechnical/environmental site investigations at various sites in the Los Angeles area, primarily for the Metro Rail subway project.

- Developed sophisticated data acquisition and data processing software for Cone Penetration Testing (CPT) systems. Developed methodologies for the application of CPT to environmental groundwater investigations.

- Coordinated and supervised a special field program to collect data to verify a finite element computer code, UNSAT1D, for flow of water through unsaturated soils. The field program included initial sampling/testing, inundation of the test pad, periodic draining and sampling/testing. In situ tests included CPT, CBR tests, and Nuclear Densiometer tests. Validated the code UNSAT1D using the collected field data

- Developed a cavity expansion theory for unsaturated soils to obtain in situ shear strength parameters using the CPT.

- Lead engineer for the closure of a landfill in an Air Force base in Southern California. Coordinated various aspects involved in preparation of a landfill closure report (e.g. cover design, selection of low permeability material, and cost estimate) and prepared the preliminary closure report.

Post Graduate Research Engineer/Research Assistant, University of California, Davis (10/1984 - 8/1988).

Key Projects:

- Incorporated the generalized Biot's formulation for the dynamic behavior of two-phase media into a two-dimensional finite element code. Predicted dynamic behavior of earth dams including the pore pressure generation and dissipation using the modified code (DYSAC2) and verified the predictions using centrifuge model test results.

- Performed centrifuge model tests and analyzed the data to verify scaling laws derived for the processes of advection, dispersion, adsorption and degradation which govern the contaminant transport in soils.

- Performed electrical in situ testing at an instrumented site in Tokyo Bay, Japan and predicted seismic response of the soil deposit with special reference to the generation and dissipation of pore water pressure during and after earthquake loading.

- Served as a consultant to ESSO resources Ltd., Canada, and Komex consultants Ltd., Canada and performed electrical in situ testing at a caisson retained island in the Canadian Beaufort Sea (Kaubvik) and predicted mechanical properties and in situ stress-strain behavior of the foundation soil.

PUBLICATIONS:

- *Journal Articles/Book Chapters (41):*

41. Wang, Z., Yang, Y., Yu, H.-S., and Muraleetharan, K.K. (2016). "Numerical Simulation of Earthquake-induced liquefaction considering the Principal Stress Rotation." *Soil Dynamics and Earthquake Engineering*, 90, 432-441.

40. Soltani, H., Muraleetharan, K.K., and Runolfsson, T. (2016). "Modal Identification of a Centrifuge Soil Model Using Subspace State Space Method." *Soil Dynamics and Earthquake Engineering*, 88, 280-296.

39. Taghavi, A., Muraleetharan, K.K., Miller, G.A., and Cerato, A.B (2016). "Centrifuge Modeling of Laterally Loaded Pile Groups in Improved Soft Clay." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 142(4).

38. Fleming, B.J., Sritharan, S., Miller, G.A., Muraleetharan, K.K. (2016). "Full-Scale Seismic Testing of Piles in Improved and Unimproved Soft Clay." *Earthquake Spectra*, 32(1), 239-265.

37. Ravichandran, N., Muraleetharan, K.K., Taylor, L.M., and Mish, K.D. (2016). "Uniform Gradient Element Formulation with Hourglass Control Scheme for Solving Fully Coupled Finite-Element Equations for Saturated Soils." *International Journal of Geomechanics*, ASCE, 16(1).

36. Cerato, A.B., Taghavi, A., Muraleetharan, K.K., and Miller, G.A. (2013). "Educational Module to Demonstrate the Seismic Behavior of Piles in Improved and Unimproved Soft Soils." *Journal of Professional Issues in Engineering Education & Practice*, ASCE, 138(4), 274-282.

35. Chen, S., Abousleiman, Y., and Muraleetharan, K.K. (2012). "Closed-Form Elastoplastic Solution for the Wellbore Problem in Strain Hardening/Softening Rock Formations." *International Journal of Geomechanics*, ASCE, 12(4), 494–507.

34. Liu, C., and Muraleetharan, K.K. (2012a). "Coupled Hydro-Mechanical Elastoplastic Constitutive Model for Unsaturated Sands and Silts. I: Formulation." *International Journal of Geomechanics*, ASCE 12(3), 239–247.

33. Liu, C., and Muraleetharan, K.K. (2012b). "Coupled Hydro-Mechanical Elastoplastic Constitutive Model for Unsaturated Sands and Silts. II: Integration, Calibration, and Validation." *International Journal of Geomechanics*, ASCE, 12(3), 248–259.

32. Solanki, P., Zaman, M., and Muraleetharan, K.K. (2011). "Validation of Backcalculated Modulus Values from Falling Weight Deflectometer through Instrumentation on I-35 in

Oklahoma." *Transportation Research Record: Journal of the Transportation Research Board, No. 2227,* 3, 79-86.

31. Kolar, R.L, Sabatini, D.A., and Muraleetharan, K.K. (2009). "Sooner City: Reflections on a curriculum reform project." in *Designing Courses for Significant Learning: Voices of Experience,* L. D. Fink and A.K. Fink (Eds.), Jossey-Bass, San Francisco, 89-95.

30. Solanki, P., Zaman, M., Muraleetharan, K.K., and Timm, D. (2009). "Evaluation of resilient moduli of pavement layers at an instrumented section on I-35 in Oklahoma." *Road Materials and Pavement Design*, 10, 167-188.

29. Ravichandran, N., and Muraleetharan, K.K. (2009). "Dynamics of unsaturated soils using various finite element formulations." *International Journal for Numerical and Analytical Methods in Geomechanics*, 33, 611-631.

28. Muraleetharan, K.K., Liu, C., Wei, C.-F., Kibbey, T.C.G., and Chen, L. (2009). "An elastoplastic framework for coupling hydraulic and mechanical behavior of unsaturated soils." *International Journal of Plasticity*, 25, 473-490.

27. Miller, G.A., Khoury, C.N., Muraleetharan, K.K., Liu, C., and Kibbey, T.C.G. (2008). "Effects of solid deformations on hysteretic soil water characteristic curves: Experiments and simulations." *Water Resources Research*, 44.

26. Yang, Y., Muraleetharan, K.K., and Yu, H.S. (2008). "Generalized trapezoidal numerical integration of an advanced soil model." *International Journal for Numerical and Analytical Methods in Geomechanics*, 32, 43-64.

25. Wei, C.-F., and Muraleetharan, K.K. (2007). "Linear viscoelastic behavior of porous media with non-uniform saturation." *International Journal of Engineering Science*, 45(2), 698-715.

24. Yang, Y., Muraleetharan, K.K., and Yu, H.S. (2006). "A middle surface concept (MSC) model for saturated sands in general stress space." *International Journal for Numerical and Analytical Methods in Geomechanics*, 30, 389-412.

23. Wei, C.-F., and Muraleetharan, K.K. (2006). "Acoustical characterization of fluid-saturated porous media with local heterogeneities: Theory and application." *International Journal of Solids and Structures*, 43(5), 982-1008.

22. Yang, Y., Yu, H.S., and Muraleetharan, K.K. (2005). "Solution existence conditions for elastoplastic constitutive models of granular materials." *International Journal of Plasticity*, 21(12), 2406-2425.

21. Muraleetharan, K.K., Deshpande, S, and Adalier, K. (2004). "Dynamic deformations in sand embankments: centrifuge modeling and blind, fully coupled analyses." *Canadian Geotechnical Journal*, 41(1), 48-69.

20. Yang, Y., and Muraleetharan, K.K. (2003) "Middle surface concept and its application to elastoplastic behavior of saturated sands." *Geotechnique,* 53**(**4), 421-431.

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6. Muraleetharan, K.K., Mish, K.D., Yogachandran, C., and Arulanandan, K. (1991). "User's manual for DYSAC2 (Version 1.0): A dynamic soil analysis code for 2-dimensional problems," *Technical Report*, Department of Civil Engineering, University of California, Davis, California.

5. Arulanandan, K., Herrmann, L.R., Mish, K.D., Dafalias, Y.F., Muraleetharan, K.K., Yogachandran, C., and Nadeswaran, V.R. (1989). "Fundamental approach to the study of soil liquefaction problem," *Technical Report* to National Science Foundation, Department of Civil Engineering, University of California, Davis, California.

4. Arulanandan, K., Yogachandran, C., Muraleetharan, K.K., Kutter, B.L., and Chang, G.S. (1987). "Seismically induced flow slide on the centrifuge," *Technical Report*, Department of Civil Engineering, University of California, Davis, California.

3. Muraleetharan, K.K., and Arulanandan, K. (1987). "Two dimensional finite element analysis of the Kaubvik caisson retained island, Beaufort Sea, Canada, using bounding surface plasticity model and input properties obtained by in Situ electrical measurements," *Technical Report* to ESSO Resources Ltd., Canada.

2. Arulanandan, K., Thompson, P.Y., Meegoda, N.J., Muraleetharan, K.K., Yogachandran, C., and Kutter, B.L. (1986). "Centrifuge modeling of transport processes of pollutant travel through soils." *Technical Report* to Air Force Engineering and Services Center, Tyndall Air Force Base, Panama City, Florida.

1. Arulanandan, K, and Muraleetharan, K.K. (1985). "Soil liquefaction-A boundary value problem (a priori prediction of pore pressure generation and dissipation during earthquakes on level ground sites)." *Technical Report*, Department of Civil Engineering, University of California, Davis, California.

PRESENTATIONS/INVITED LECTURES (selected):

37. "Improving Seismic Performance of Pile Foundations in Soft Clays Using Deep Soil Mixing." Invited Lecture, the Hong Kong University of Science and Technology, Hong Kong, October 2015 (with Dr. Miller).

36. "Seismic Behavior of Pile Foundations in Improved and Unimproved Soft Clays." Invited Lecture, Cambridge University, Cambridge, England, March 2013.

35. "The Role of Soil-Structure Interaction in Civil Engineering Projects." Invited Lecture, Guilin University of Technology, Guilin, China, October 2012.

34. "Seismic Behavior of Pile Foundations in Improved and Unimproved Soft Clays." Invited Lecture, the Institute of Rock and Soil Mechanics, Chinese Academy of Sciences, Wuhan, China, October 2012.

33. "Seismic Behavior of Pile Foundations in Improved and Unimproved Soft Clays." Invited Lecture, Xi'an University of Technology, Xi'an, China, October 2012.

32. "Elastoplasticity of Three-phase Porous Media." Invited Lecture, Beijing Jiaotong University, Beijing, China, October 2012.

31. "Centrifuge Modeling of Wetting Induced Landslides." Invited Lecture, International Symposium Geotechnical and Geosynthetics Engineering: Challenges and Opportunities on Climate Change Bangkok, Thailand, December 2010.

30. "Elastoplasticity of Three-phase Porous Media." Keynote Lecture, International Symposium on Plasticity, St. Thomas, U.S. Virgin Islands, January 2009.

29. "Fully Coupled Simulations of Dynamics of Porous Media Using a Finite Element Framework." Invited Lecture, the Institute of Rock and Soil Mechanics, Chinese Academy of Sciences, Wuhan, China, June 2006.

28. "Advanced Numerical Models in Practice and Elastoplasticity of Unsaturated Soils." Invited Lecture, NSF sponsored Workshop on Nonlinear Modeling of Geotechnical Problems: From Theory to Practice, the Johns Hopkins University, November 2005.

27. "A Comprehensive Approach to Modeling the Behavior of Unsaturated Soils Using an Elastoplastic Framework." Invited Lecture, 2nd U.S.-Japan Workshop on Geomechanics, Kyoto, Japan, September 2005.

26. "Environmental Quality Models." A graduate course (co-taught with Dr. Kolar), National Reserch Center in Environmental and Hazardous Waste Management (NRC-EHWM), Chulalongkorn University, Bangkok, Thailand, July 2004.

25. "CAREER Workshop." An Invited Half-Day Workshop on How to Effectively Write a NSF CAREER Proposal, Louisiana State University, Baton Rouge, Louisiana, March 2004.

24. "Fully Coupled Simulations of Dynamics of Porous Media Using a Finite Element Framework." Invited Lecture, Department of Civil and Environmental Engineering, Louisiana State University, Baton Rouge, Louisiana, March 2004.

23. "Environmental Quality Models." A graduate course (co-taught with Dr. Kolar), National Reserch Center in Environmental and Hazardous Waste Management (NRC-EHWM), Chulalongkorn University, Bangkok, Thailand, July/August 2003.

22. "Groundwater Quality Protection." A graduate course (co-taught with Dr. Sabatini), National Reserch Center in Environmental and Hazardous Waste Management (NRC-EHWM), Chulalongkorn University, Bangkok, Thailand, July 2002.

21. "Static and Dynamic Behavior of Unsaturated Soils Using the Theory of Mixtures with Interfaces." Invited Lecture, School of Civil and Environmental Engineering, University of New South Wales, New South Wales, Australia, May 2002.

20. "Use of Centrifuge and Numerical Modeling in the Design of Port of Los Angeles' Pier 400." Invited Lecture, Centre for Geotechnical Research, University of Sydney, New South Wales, Australia, May 2002.

19. "Static and Dynamic Behavior of Unsaturated Soils Using the Theory of Mixtures with Interfaces." Invited Lecture, Department of Civil and Resource Engineering, University of Western Australia, Perth, Western Australia, Australia, April 2002.

18. "Use of Centrifuge and Numerical Modeling in the Design of Port of Los Angeles' Pier 400." Invited Lecture, Department of Civil and Resource Engineering, University of Western Australia, Perth, Western Australia, Australia, March 2002.

17. "Soil Plasticity." An Invited Short-Course, Centre for Offshore Foundation Systems, University of Western Australia, Perth, Western Australia, Australia, March/April 2002.

16. "Dynamic Behavior of Multiphase Porous Media Using the Theory of Mixtures with Interfaces(TMI): Theory, Implementation, and Validation." (with Changfu Wei) *SIAM Conference on Mathematical and Computational Issues in the Geosciences*, Boulder, Colorado, June 2001.

15. "Anywhere and Anytime Learning: An Experience with Engineering Freshmen Using Laptops and a Wireless Network in the Classroom." Invited Lecture, Howard R. Hughes College of Engineering, University of Nevada, Las Vegas, October 2000.

14. "Barriers to Simulation in Civil Engineering." Panelist Comments, Workshop on Barriers to Predictive Simulation in Science and Engineering, Lawrence Livermore National Laboratory, Livermore, California, October 2000.

13. "Prediction of Dynamic Behavior of Compacted Soil Embankments Using the Theory of Mixtures with Interfaces." Invited Lecture, Royal Military College of Canada, Kingston, Ontario, Canada, July 2000.

12. "Prediction of Dynamic Behavior of Compacted Soil Embankments Using the Theory of Mixtures with Interfaces." Invited Lecture, Lawrence Livermore National Laboratory, Livermore, California, June 2000.

11. "Dissemination of results from the fully coupled analyses of geotechnical structures using the web." Invited Lecture (with K.D. Mish), NSF sponsored workshop on *Demystifying the Internet to Foster Collaboration Among the Earthquake Engineering Researchers*, Chico, California, August 1997 (published on the web).

10. "Technology in learning: An experience with engineering freshmen using laptops and wireless network in the classroom." *ASEE Annual Conference*, Milwaukee, June 1997.

9. "Application of verified static and dynamic fully coupled numerical procedures in the design of port facilities." Invited Lecture, NSF Sponsored *Workshop/Conference on Application of Numerical Procedures in Geotechnical Earthquake Engineering,* University of California, Davis, October 1996.

8. "VELACS Extension: Predictions using DYSAC2." NSF Sponsored *Workshop/Conference on Application of Numerical Procedures in Geotechnical Earthquake Engineering,* Davis, California, October 1996.

7. Two invited lectures and three computer demonstrations on "Use of computer codes in the analysis of geotechnical earthquake engineering boundary value problems." given to industry representatives, faculty members, and students, University of California, Davis, California, May 1996.

6. "Interpretation of cone penetration test data in unsaturated soils using cavity expansion theories." Presentation made at the *A2L06 (Committee on Environmental Factors Except Frost) committee meeting*, TRB Annual Meeting, Washington, D.C., January 1996.

5. "VELACS Extension: Model 1 predictions using DYSAC2." Presentation made at the NSF funded *VELACS Extension project meeting*, MIT, Cambridge, Massachusetts, October 1995.

4. "Application of Fully-Coupled Numerical Procedures in Geotechnical Earthquake Engineering Practice." Invited Lecture, *U.S.-Japan Workshop on Collaborative Research in Learning from the Kobe Failures*, Kyoto University, Kyoto, Japan, September 1995.

3. "Geotechnical research needs in the development of numerical procedures for seismic evaluations." National Science Foundation sponsored workshop on *Geotechnical Research Needs for the Assessment and Mitigation of Infrastructure Deterioration in Response to Earthquakes*, Sacramento, California, February 1992.

2. "Application of non-destructive characterization of soil to the prediction of pore pressure generation and dissipation during earthquakes." Workshop on *Site Characterization for the Reduction of Disasters' Toll*, University of California, Davis, California, July 1990.

1. "Behavior of Heterogeneous Earth Dams during Earthquakes." *Industrial Affiliates Program Conference*, College of Engineering, University of California, Davis (represented the Department of Civil Engineering by winning the graduate student research presentation competition), California, November 1988.

SOCIETIES:

- American Society of Civil Engineers
- International Society for Soil Mechanics and Geotechnical Engineering
- American Society for Engineering Education

SERVICE:

Professional (selected):

- Managing Editor, Special issues on Experimental and Computational Geomechanics for Unsaturated Soils, ASCE International Journal of Geomechanics, December 2013 – Present.
- Co-organizer, Four sessions on Analytical and Computational Solutions to Problems in Poromechanics, Fourth Biot Conference on Poromechanics, Columbia University, New York, June 2009.

- Editorial Board Member, Journal of Geotechnical and Geoenvironmental Engineering, ASCE (October 2005 – January 2011)

- Chair, Local Organizing Committee, 3rd Biot International Conference on Poromechanics, University of Oklahoma, Norman, Oklahoma, May 24-27, 2005.

- Member, Poromechanics Committee, Engineering Mechanics Institute, ASCE (2002 – present).

- Member, Soil Properties and Modeling Committee, Geo-Institute, ASCE (1996 – present).

- Member, Unsaturated Soils Committee, Geo-Institute, ASCE (2007 – present).

- Member, Engineering Behavior of Unsaturated Soils Committee (previously Committee on Environmental Factors Except Frost), Transportation Research Board, National Research Council (1995-2001).

- Member, Subcommittee on Centrifuge Testing, Transportation Research Board, National Research Council (February 1995 - June 1998).

- University contact member, United States Universities Council on Geotechnical Education Research (USUCGER).

- Proposal Reviewer/Panelist: National Science Foundation's Division of Earth Sciences, Division of Civil and Mechanical Systems, Division of Engineering Education and Centers, and Division of International Programs; and the Israel Science Foundation.

- Technical Paper Reviewer: Journal of Geotechnical and Geoenvironmental Engineering, Journal of Engineering Mechanics, Practice Periodical of Hazardous, Toxic, and Radioactive Waste Management, ASCE; International Journal for Numerical and Analytical Methods in Geomechanics; Journal of Computer Methods in Applied Mechanics and Engineering; Journal of Hazardous Materials; Journal of Geotechnical and Geological Engineering (a journal published in Netherlands with European editors); International Journal of Geomechanics; Geotechnical Testing Journal, ASTM; Transportation Research Board; and Geo-Institute Specialty Conferences, ASCE.

- Co-organized two sessions on Soil-Structure Interaction in Transportation Projects at the ASCE, Geo-Institute conference Geo-Trans 2004, Los Angeles, California, July 2004.

- Organized a session on Computational Poromechanics at the ASCE 17th Engineering Mechanics Conference, Newark, Delaware, June 2004.

- Co-organized a NSF-sponsored international workshop on Earthquake Simulation in Geotechnical Engineering at the Case Western Reserve University in Cleveland, Ohio, November 2001.

- Organized a session on Performance of Compacted Fill Soil Embankments for the ASCE, Geo-Institute Specialty Conference on Performance Verification of Constructed Geotechnical Facilities-Amherst 2K, Amherst, MA, April 2000.

- Member of a panel on *Developing Effective Partnership with Industry* for the Engineering Directorate at the NSF CAREER PI Meeting, January 1999.

- One of the five members of a National committee that organized a workshop on "*Integration of Research and Engineering Education"* for the CAREER awardees of the NSF's Civil and Mechanical Systems Division, November 1998. Also the host of the virtual web conference for the above workshop prior to and after the physical workshop. Chaired a session at the physical workshop.

- Co-reporter and Technical Paper Reviewer: Session III - Liquefaction and Ground Failure, Third International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, April 2-7, 1995, St. Louis, Missouri.

Department:

- Committee A (8/2006 – 8/2009)
- Geotechnical faculty search committee (10/2003 – 5/2004)
- Structural faculty search committee, Co-chair (1/2001 – 8/2001)
- Director Search committee (5/2000 – 1/2001)
- Undergraduate curriculum committee (9/1995 – 8/2001, 8/2002 – 7/2012), Chair (1/1999 – 8/2001, 8/2005-8/2008)
- Computing/Technology committee (5/2000 – 7/2012)
- Undergraduate scholarship committee (9/1994 – 7/2002).

College of Engineering:

- Workshops on CAREER proposal writing (2007).
- Laptop Pilot Program (7/1996 – 5/1997).
- Engineering Education Committee (3/2004 – 12/2004).

University:

- Chair, Faculty Compensation Committee (08/2010 – 05/2012)
- Retirement Plans Management Committee (03/2010 – 05/2012)
- Faculty Senate Executive Committee (08/2009 – 05/2012; 08/2014 – 05/2015)
- Faculty Senate (8/2008 – 05/2011).
- Faculty advisor, Sri Lankan Students' Association, 1997 – 2002.
- Session Leader, TA training.
- Made a presentation to the OU faculty at the workshop organized by the Vice President for Research on preparing NSF CAREER proposals, 2002.

OUTREACH ACTIVITIES:

- Served as a mentor to ten high school students for their science projects. Several of these students have won awards at the Regional and State science competitions. One student, Emily Self, won the Distinguished Achievement Award from the Society of Exploration Geologist at the 2002 International Science and Engineering Fair.

- Oklahoma School of Science and Mathematics (OSSM) selection panel.