
XIONG (Bill) YU, Ph.D., P.E.
Associate Professor

Contact

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Biography

Dr. Xiong (Bill) Yu is an associate professor at the Department of Civil Engineering, Case Western Reserve University. He also holds courtesy appoints from EE, BME and other departments. Dr. Yu received his Ph.D. degree from Purdue University, B.S. and M.S. degrees from Tsinghua University, China. He also holds a M.S. degree from the School of Electrical Engineering and Computer Science, Purdue University and a B.S. degree from the School of Computer Science, Tsinghua University. He joined Case Western Reserve University as an assistant professor in 2005.

Dr. Yu's current research interests include *geoengineering, geomaterials, innovative sensors, structural health monitoring, smart driving and working environment, and sustainable and multifunctional materials*. His research puts a strong interdisciplinary perspectives to improve intelligent and durability of geosystem, civil infrastructure and building systems. He has led around 26 competitive research projects, including 8 projects sponsored by the National Science Foundation (7 as PI, 1 as co-PI), the National Research Council, the Federal Highway Administration, and the Ohio Board of Regents, the Ohio Department of Transportation, and private industry. Dr. Yu received NSF CAREER award in 2009. He has published over 180 papers in journals and referred conference proceedings. He has involved in editing 3 Geotechnical Special Publications and served as the guest editor for a few journal issues. He holds 2 U.S. patents, 2 pending U.S. patent applications, and a few additional invention disclosures.

Dr. Yu has graduated 5 Ph.D.s. Four (4) students received tenure track faculty positions in the U.S. institute of higher education (one at the University of Texas, Arlington, one at the Michigan Technological University, one at the University of Akron, one at Mount Union University). He currently advises the dissertation work of 8 Ph.D. students. He has also advised the research of over 25 undergraduate students. Many of them have published papers in referred conferences and journals. A few students have also won recognitions by various research awards and student paper competitions.

Dr. Yu has been actively engaged in international collaborations in advanced research and education. He has delivered over 20 invited talks at the U.S., China, Japan, and other countries. He is also a member of U.S. research community to participate international research dialogue, including Keynote speech at the US-China Workshop on Sustainable Materials in Beijing, China in 2008. The US-Japan Workshop on Bio-inspired Engineering for Next-Generation Sensors and Actuators in 2011. He is selected to participate in the U.S.-Germany Frontiers of Engineering symposium in 2013.

Dr. Yu serves on committees of ASCE, ASME, IEEE, SPIE, etc. He is the chair of the Geo-Institute Engineering Geology and Site Characterization committee, which was selected to receive the Geo-Institute Committee of the Year award for activities in 2013. He is also a member of the expert task group for the Strategic Highway Research Program (SHRP) and the National Cooperative Highway Research Program (NCHRP) projects. He is an associate editor of Journal of Materials in Civil Engineering and serves on the editorial board of Geotechnical Testing Journal, Journal of Testing and Evaluation, and Journal of Advances in Civil Engineering Materials. He is a reviewer for over 20 journals and a number of conferences.

ACADEMIC EMPLOYMENT

July 2011-Present, Associate Professor with tenure, Department of Civil Engineering, Case Western Reserve University
 Sep. 2012- present, courtesy appointment, Department of Biomedical Engineering, Case Western Reserve University
 Sep. 2010- present, courtesy appointment, Department of Mechanical and Aerospace Engineering, Case Western Reserve University
 Feb. 2009- Present, courtesy appointment, Department of Electrical Engineering and Computer Science, Case Western Reserve University
 Jan. 2005 – present, Assistant Professor, Department of Civil Engineering, Case Western Reserve University
 Aug. 2003 – Jan. 2005, Postdoctoral Associate, School of Civil Engineering, Purdue University
 Sept. 2000 – July, 2003, Graduate Research and Teaching Assistant, School of Civil Engineering, Purdue University
 Sep. 1997 – June, 2000, Graduate Research Assistant, Department of Hydraulic Engineering, Tsinghua University
 June 1995 – July, 1997, Undergraduate Research Assistant, Department of Hydraulic Engineering, Tsinghua University

EDUCATION

Purdue University, School of Civil Engineering

Ph.D. in Civil/Geotechnical Engineering 08/2003

Purdue University, School of Electrical and Computer Engineering

M.S. in Electrical and Computer Engineering 12/2002

Tsinghua University, Department of Hydraulic Engineering

M.S. in Civil/Geotechnical Engineering 07/2000

Distinction: Graduate with honor

B.S. in Civil/Hydraulic Engineering 07/1997

Distinction: Graduate with honor

B.S. in Computer Science 07/1997

PROFESSIONAL REGISTRATION

P.E., Ohio State #69123 (Certified with Honor, the highest score in the State of Ohio, Spring 2004)

HONORS AND AWARDS

Selected to participate US/Germany Frontier of Engineering Symposium	2013
Case School of Engineering Faculty Research Award	2012
American Society of Non-destructive Testing (ASNT) Research Fellowship	2010
National Science Foundation CAREER Award	2009
Nominated for John S. Diekhoff Awards in Excellent Graduate Teaching	2010
Semifinalist for John S. Diekhoff Awards in Excellent Graduate Mentoring	2009
Andrews Fellowship, Purdue University	2000-2002
Outstanding M.S. Thesis Award, Tsinghua University	2000
Outstanding graduate student, Tsinghua University	1999
Prize of Challenge-Cup Science&Technology Invention Competition, Tsinghua University	1999
Excellent undergraduate student, Tsinghua University	1997
Various competitive scholarships during undergraduate and graduate study, 1992-2000	
Excellent Student of Tsinghua University Scholarship (twice)	1996, 1999
Dong's Oriental Scholarship	1998
Guang Hua Scholarship	1995
Tsinghua University Alumni Scholarships for excellence in physics, mechanics of material, and structure mechanics respectively	1993, 1994
Hydraulic and Hydropower Institute of China Scholarship	1994
Zhang Guangdou Scholarship	1993
Excellent Student Scholarship	1992

FACULTY DEVELOPMENT SCHOLARSHIPS

Fellowship for the Summer Nano-Institute on Materiomics, MIT, May 30-June 1, 2012
CWRU Media Production Workshop 2012
CWRU Internet Tools Workshop 2012
Hybrid Simulation Workshop June 28-29, Berkeley, CA
Travel grants from CSE Office of Faculty Development 2009, 2010
Multiple travel grants from the National Science Foundation, 2006, 2007, 2008, 2009, 2010
Faculty Training Fellowship from ASEE/ASCE for attending Excellence in Civil Engineering Education workshop, 2007
Faculty Training Fellowship from National Center for Asphalt Technology, 2006
Faculty Training fellowship from Network for Earthquake Engineering Simulation, 2005 (RPI), 2006 (Cornell), 2006 (UC. Davis)
Faculty Training Fellowship from Pile Driving Contractors Association, 2005
ASCE/ASEE Excellent in Civil Engineering Education (ExCEED) Workshop, Summer 2007
CWRU UCITE Teaching Workshop, Fall 2009

PROFESSIONAL MEMBERSHIP AND ACTIVITIES

Editorial Board Member

Journal of Testing and Evaluation (since 2009)
Geotechnical Testing Journal (since 2011)
Journal of Advancement in Civil Engineering Materials (2012- present)
Journal of ASTM International (2009-2012)
Associate Editor, ASCE Journal of Materials in Civil Engineering (2010-2013)

Guest Editor for Special Issues

Acta Gotechnica 2013
Journal of Geotechnical and Geological Engineering 2013
International Journal of Pavement Research and Technology 2012
Journal of Zhejiang University 2012

Leadership in Technical Committee

- Chair, ASCE G-I Engineering Geology and Site Characterization
- Chair, ASTM D18.26.11 subcommittee
- TRB University Representative

Grant Review Panel

NSF
NASA
DOE Basic Science program
Louisiana Board of Regent grant
Polish Academy of Science proposal

Membership in Professional Organizations

- American Society of Civil Engineers (ASCE), Member.
- International Society for Optical Engineering (SPIE)
- Institute of Electrical and Electronics Engineers (IEEE).
- Geo-Institute, American Society of Civil Engineers (ASCE).
- Transportation Research Board (TRB).
- International Society for Rock Mechanics and Geotechnical Engineering (ISSMEG)
- Geo-Engineering Extreme Events Reconnaissance (GEER)
- American Society of Non-destructive Testing.

Membership in Technical Committee and Task Force

- ASCE Geo-Institute Committee on Engineering Geology and Site Characterization (Vice Chair 2009-2013,

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- Committee Chair since 2013)
 - ASCE Geo-Institute Committee on Geophysical Engineering
 - ASCE Geo-Institute Committee on Risk Assessment
 - ASCE Committee on Pavement Engineering
 - ASCE G-I Task Force on Sustainability and Climate Change
 - ASTM D04 Committee on Soils and Rocks
 - SPIE Committee on Smart Materials and Structures
 - IEEE Intelligent Transportation System Society
 - IEEE Instrument and Measurement Society
 - ASME Energy Sustainability Committee
 - TRB AFP60 Committee on Unsaturated Soils
 - TRB AFP20 Committee on Characterization of Earth Materials

RESEARCH INTERESTS

- Geotechnical engineering, environmental geotechnology, foundation engineering
- Innovative sensor technology for energy, environment and human health applications
- Non-Destructive Testing
- Smart materials and functional materials
- Structural health monitoring
- Multi-scale and multiphysics modeling of engineering materials
- Intelligent infrastructures, green design, sustainable engineering.
- Efficient design and management of engineering systems

RESEARCH PROJECTS

Current projects

1. PI, GOALI: An Innovative Real Time Bridge Scour Sensor, National Science Foundation, \$472,646, May 1st, 2009-April 30, 2014. Translational Research in the Academic Community (TRAC) project (co-PI: Rausche), National Science Foundation, September 1, 2010-August 30, 2014.
2. PI, CAREER: Fusion of Multiscale Sensing and Simulations for Bridge Scour Risk Management, National Science Foundation, \$450,000, July 1st, 2009-June 30, 2014.
3. Co-PI, Renewable Resource Materials: Developing a New “Platform with a Purpose”, National Science Foundation, Sep 2011-Aug 2013, \$600,000.
4. PI, A High Resolution Distributed Sensor for Liquefaction Induced Void Redistribution, National Science Foundation, \$226,598, Sep 2011-Aug 2014.
5. PI, The use of thermochromic materials for pavement life extension, Ohio Partnership for Research and Innovation (OPREP), the Ohio Department of Transportation, \$250,000, June, 2012-Dec 2014.
6. PI, Collaborative Research: Nexus of Simulation, Sensing and Actuation for Aerodynamic Loads Reduction of Wind Turbine Blades, collaborators (Dr. Qingli Dai and Dr. Fernando Ponta, Michigan Technological University), \$400,000, 2013-2016.
7. PI, Effective Berm Compaction, Ohio DOT, \$210,000, December 2013-June 2016.

Selected for Funding

PI, understanding the soil plugging mechanism in large open-ended pipe pile, the Ohio Department of Transportation, ~\$250,000, 36 months.

Pending Proposals

Two pending proposals with NSF (one on porous materials and one on sensor technology)

One pending with AFOSR (bioinspired flow sensor)

Completed Projects

1. PI, "Upgrading and Expanding PMTDR-RDR and PMTDR-SM for HL8200NET", subcontract from Purdue University, \$7,998, 2005.
2. PI, "Technical Assistance Agreement Assistance in understanding MDI_PDA design and Algorithms", from Durham Geo Enterprises, \$2,254, 2005.
3. PI, Kelvin Smith Library Grant, \$3507.5, 2005.
4. PI, "Improvement of TDR Measurement Theory and Incorporation into MDI-PDA Software", from Durham Geo Enterprises, \$6,609, 2006.
5. PI, Testing of Unknown Foundation for St. Joseph's Hospital Project, \$4,017, WPC Inc., 2006.
6. PI, Assistant for SLNG Project, \$2,936, WPC Inc., 2007.
7. PI, Seismic Down Hole Tests for Sewage District Project, \$3,000, DLZ Ohio, Inc., 2007.
8. PI, Further Development of PDA Technology, \$20,420, GRL/PDI Inc., Nov 2006-Feb 2008.
9. PI, Developing TDR Instrument for QA/QC of Early Stage Concrete, \$84,995, cost share \$37,864, National Cooperative Highway Research Program-Innovation Deserve Exploratory Analyses (NCHRP-IDEA), National Academy of Science, March 2007-Sep 2008.
10. PI, Performance and economic benefits of thick granular base for flexible pavement design, \$10,000, the Ohio Department of Transportation/Federal Highway Administration, Jan 2008-May 2009.
11. PI, Beneficial Utilization of Lime Sludge in Transportation, the Ohio Department of Transportation/Federal Highway Administration, \$20,000, Feb 2009-June 2010.
12. PI, Provost Opportunity Fund, ACES+, \$4,000, April 2009-May 2010.
13. PI, Dielectric and Mechanical Spectra Assisted Multi-Scale Study of Early Stage Concrete, \$148,428, National Science Foundation, July 15, 2007-July 31, 2010.
14. PI, Bridge scour monitoring of scour critical bridge: a pilot study of TDR scour automatic monitoring system, \$83,772, cost-share (including contribution by industry partner) \$84,529, the Ohio Department of Transportation/Federal Highway Administration, selected for funding, est. Jan 2008-Sep 2010.
15. PI, Performance and Physiological Based Drowsiness Detection System, Ohio Board of Regents, \$75,000, Aug 2008-July 2010.
16. PI, NSF CCLI Phase II subcontract from Cleveland State University (PI Norbert Delatte), \$10,000, Nov 1st, 2009-Oct 31, 2012.
17. PI, An Innovative Non-contact Sensing Platform to Prevent Traffic Accidents due to Driver Drowsiness (co-PI: Feng), the Ohio Transportation Consortium, \$28,000 plus \$30,000 cost share, Aug 2010-Sep 2011.
18. PI, MRI: Acquisition of A High Fidelity Driver Simulator (co-PIs Kingman Strohl, Pingfu Feng, Todd Oakley, Marian Patterson), National Science Foundation, \$135,064, plus \$60,000 Ohio DOD action fund, \$60,000 CSE Matching Fund, Aug 1st, 2009-July 31, 2011.
19. PI, Collaborative Research: Understanding Frost-Damage of Concrete from Microstructure Aspects, \$110,272 (collaboration with Drs. Qingli (Babara) Dai and Zhanping You, Michigan Technological University, total project fund: \$300,000 after budget reduction), National Science Foundation, June 15st, 2009-May 30, 2013.
20. PI, Noncontact Drowsiness Detection System, National Research Council, Safety-IDEA program, \$100,000, Feb 2011-Jan 2012.
21. PI, scour sensor development service agreement, Jackson State University, \$30,000, February 2013 to December 2013.

PI for Student Research Grant and Scholarship

1. PI, SOURCE summer research grant for Alan Baribault, \$3000, 2006.

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2. PI, Eisenhower Transportation Fellowship for Xinbao Yu, \$1,500, Federal Highway Administration, 2007.
 3. PI, SOURCE summer research grant for Ben Ma, \$3,000, 2007.
 4. PI, SURES summer research grants for Jingsi Lang, \$3,400, June 2008-Aug 2008.
 5. PI, SURES summer research grants for Alex Cartweight, \$3,400, June 2008-Aug 2008.
 6. PI, Eisenhower Fellowship for Xinbao Yu, Federal Highway Administration, \$1,500, July 2008-June 2009.
 7. PI, SURES summer research grants for Cassandra McFadden, \$3,400, June 2009-Aug 2009.
 8. PI, SURES summer research grants for Paul Mangola, \$3,400, June 2009-Aug 2009.
 9. PI, SURES summer research grants for Wenjie Xia, \$3,400, June 2010-July 2010.

Funded Projects as Post-Doctor at Purdue University

1. Co-PI, "Integrate and Develop PDA and Software System for Field Control of Time Domain Reflectometry Measurements", Durham Geo Slope Indicator, \$9,134, 2003.
2. Co-PI, "Upgrading the Current Experiment Control System from Serial Communication Interface to Ethernet Communication Interface", Durham Geo Slope Indicator, \$9,900, 2004.
3. Took a major role in developing a successful NSF proposal, "Advanced Analysis of Electromagnetic Waves for Intrinsic Soil Properties" \$201,377 (PI Dr. Drnevich, Co-PI. Dr. Nowack), 2003-2005.

BOOK EDITOR

1. Member of publication committee, ASCE Shale Energy Engineering Conference, July 2014 (proceeding will be edited)
2. Murad, Abu-Farsakh, **Yu, X.**, and Laureano, Hoyos, Proceedings of ASCE GeoCongress, Feb 2014
3. Hu, J.P., Ma, J.L., Meneses, J., Qiu, T., **Yu, X.** (Bill), Zeng, X.W. (2013) IACGE 2013: Challenges and Recent Advances in Geotechnical and Seismic Research and Practices (Geotechnical Special Publication (GSP) 232)
4. Huang, M.S., **Yu, X.**, Huang, Y. (2010) Soil Dynamics and Earthquake Engineering, ASCE Geotechnical Special Publication (GSP 201), 360p.
5. Zhang, X., **Yu, X.**, Fu, H.Y. and Zhang, J. (2009). Characterization, Modeling and Performance of Geomaterials, ASCE Geotechnical Special Publication (GSP 189), 196p.
6. Nazzaril, S., **Yu, X.** and Rosenblad, B. (2007). Innovative Applications of Geophysics in Civil Engineering, ASCE Geotechnical Special Publication (GSP 164), 108p.

PUBLICATIONS

Over 180 papers in journals and referred conference proceedings (advised students are underlined).

Journal Papers

Papers Accepted or Published

1. Dai, Q., Ng, K., Liu, Y., and Yu, X. (2013). "Investigation of Internal Frost Damage in Concrete with Thermodynamic Analysis, Microdamage Modeling, and Time-Domain Reflectometry Sensor Measurements." J. Mater. Civ. Eng., 25(9), 1248–1259.
2. Dai, Q.L., Kenneth, N.G., Sun, Y., and **Yu, X.** (2013). Investigation of Internal Frost Damage in Cementitious Materials with Micromechanics Analysis, SEM Imaging and Ultrasonic Wave Scattering Techniques, *Construction & Building Materials*, in production.

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3. Hu, J.Y., Wanasekara, N., Yu, X. (Bill) (2013). Characterization of Temperature Dependent Thermal Properties of Thermo-chromic Asphalt Binders, *Journal of Transportation Research Record*, accepted (to appear in 2014 issues)
 4. Liu, Z., Zhang, B., **Yu, X.**, Tao, J., Sun, Y. and Gao, Q. 2013. Thermally Induced Water Flux in Soils. *Journal of Transportation Research Record*. (Accepted, to appear in 2013 issue)
 5. Liu, Z. and **Yu, X.** (2013). A Physically-Based Equation for the Phase Composition Curve of Frozen Soils, *Journal of Transportation Research Record*. (Accepted, to appear in 2013 issue).
 6. Liu, Z., **Yu, X.** and Wan, L. (2013). An Investigation in the Influence of Contact Angle on Soil Water Characteristic Curve with a Modified Capillary Rise Method, *Journal of Transportation Research Record*. (Accepted, to appear in 2013 issue).
 7. Sun, Y. and YU, X. (2013). An Innovative Non-intrusive Driver Assistance System for Vital Signal Monitoring, *Journal of Biomedical and Health Informatics (J-BHI)*, under minor revision.
 8. Kung, Chih-Chien; Lin, Po-Yuan; Buse, Frederick John; Xue, Yuhua; Yu, X.; Dai, Liming; Liu, Chung-Chiun (2014). Preparation and characterization of three dimensional graphene foam supported platinum–ruthenium bimetallic nanocatalysts for hydrogen peroxide based electrochemical biosensors, *Biosensors and Bioelectronics*, v 52, p 1-7, February 15, 2014
 9. Chih-Chien Kung, Po-Yuan Lin, Yuhua Xue, Rohan Akolkar, Liming Dai, Xiong Yu, Chung-Chiun Liu (2014). Three dimensional graphene foam supported platinum–ruthenium bimetallic nanocatalysts for direct methanol and direct ethanol fuel cell applications, *Journal of Power Sources*, In Press, Accepted Manuscript, Available online 25 January 2014.
 10. Hu, J.Y. and Yu, X. (2013). Experimental Study of Sustainable Asphalt Binder: Influence of Thermo-chromic Materials, *Journal of Transportation Research Record*. (Accepted, to appear in 2013 issue).
 11. Liu, Z. and **Yu, X.** (2013). Thermo-Hydro-Mechanical-Chemical Simulation of Methane Hydrate Dissociation in Porous Media, *Journal of Geotechnical and Geological Engineering*, in production.
 12. Wang, R., Tao, J., **Yu, X.** and Dai, L. (2013). Characterization of multi-walled carbon nanotubes/polymethyl meth-acrylate composites as denture base materials. *J. Biomater. Res. Part B* (in press).
 13. Liu, Z. and **Yu, X.** (2013). Multiphysics modeling of pavement under frost action, *International Journal of Pavement Engineering*, in production.
 14. Hu, J.Y. and **Yu, X.** (2013). Innovative Chromogenic Materials for Pavement Life Extension: Modeling Study of Surface Temperature of Sustainable Asphalt Pavement, *International Journal of Pavement Research and Technology*, Mar2013, Vol. 6 Issue 2, p141-146.
 15. Sun, Y., **Yu, X.**, Liu, Z., Liu, Y., Tao, J.L. (2013). Advanced Ultrasonic Technology for Freezing Damage Prevention of Concrete, *International Journal of Pavement Research and Technology*, International Journal of Pavement Research & Technology; Mar2013, Vol. 6 Issue 2, p86-90.
 16. Wu, G. X. and **Yu, X.** (2013). Computer-Aided Design of Thermal Energy Harvesting System across Pavement Structure, *International Journal of Pavement Research and Technology*, 5(5): 311-316.
 17. Liu, Z. and **Yu, X.** (2013) Multiscale Chemo-Thermo-Hydro-Mechanical Modeling of Early Stage Cement Hydration and Shrinkage, *Journal of Materials in Civil Engineering*, Vol. 25, No. 9, September 2013, pp. 1239-1247
 18. Sun, Y., Chung, C.-Y., **Yu, X.**, Liu, Z., Liu, Y. & Tao, J. (2013). Advanced Ultrasonic Thechnology for Air Void Distribution in Concrete. *Materials Evaluation*, ASNT, March 2013 pp359-368.
 19. Yu, X.B., Zhang, B., Tao, J. and **Yu, X.** (2013). A New Time Domain Reflectometry Bridge Scour Sensor, *Structural Health Monitoring*. 2013 vol. 12 no. 2 99-113, doi: 10.1177/1475921713476331
 20. Tao, J. and **Yu, X.** (2012). Hair flow sensors: from bio-inspiration to bio-mimicking—a review. *Smart Materials and Structures*, 21, 113001. Doi:10.1088/0964-1726/21/11/113001

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21. Tao, J., Sun, Y., Wu, G. and Yu, X. (2012). Emulating the directional sensitivity of fish hair cell sensor. *Journal of Intelligent Material Systems and Structures*, January 17, 2013 1045389X12473378
 22. Liu, Z., Yu, X., Tao, J. and Sun, Y. (2012). Multiphysics extension to physically based analyses of pipes with emphasis on frost actions. *Journal of Zhejiang University SCIENCE A*, 13, 877-887. DOI: 10.1631/jzus.A12ISGT2
 23. Liu, Z., Zhang, B., Yu, X., Zhang, B. and Tao, J. (2012). A New Method for Soil Water Characteristic Curve Measurement Based on Similarities between Soil Freezing and Drying. *Geotechnical Testing Journal*, 35, GTJ103653 DOI: 10.1520/GTJ103653
 24. Liu, Z., Yu, X., Sun, Y. and Zhang, B. (2012). Formulation and Characterization of Freezing Saturated Soils, *Journal of Cold Region Engineering*, 27(2), 94–107.
 25. Liu, Z., Yu, X.B., Yu, X. and Gonzalez, J. (2011). Time Domain Reflectometry Sensor-Assisted Freeze/Thaw Analysis on Geomaterials, *Cold Regions Science and Technology*, in press, DOI: 10.1016/j.coldregions.2011.10.002.
 26. Liu, Z. and Yu, X. (2011). Coupled Thermo-Hydro-Mechanical Model for Porous Materials under Frost Action: Theory and Implementation, *ACTA Geotechnica*, Vol. 6, I. 2, p.51-65.
 27. Liu, Z. and Yu, X. (2011). Coupled Hydro-Thermo-Mechanical Modelling of Pavement under Frost Action, *International Journal of Pavement Engineering*, 6(2):51-65. DOI:10.1007/s11440-011-0135-6.
 28. Liu, Z., Yu, X.B., Gonzalez, J., and Yu, X. (2011). Innovative Sensor and Analyses for Investigating the Effects of Freeze-Thaw on Soils, *Advanced Materials Research*, Vols. 255-260, p. 4251-4255.
 29. Liu, Z., Zhang, B. and Yu, X. (2011). Multiphysics for Early Stage Cement Hydration: Theoretical Framework, *Advanced Materials Research*, Vols. 255-260, p. 4247-4250.
 30. *Liu, Z., Sun, Y. and Yu, X. (2011). Theoretical basis for Modeling Porous GeoMaterials under Frost Action: A Review, *Soil Science Society America Journal*, Vol. 76 No. 2, p. 313-330
 31. Dai, Q.L., Yu, X., Ng, K., and Liu, Z. (2011). Development of Micromechanics Models and Innovative Sensor Technologies to Evaluate Internal-Frost Damage of Concrete, *Journal of Transportation Research Record, Volume 2240 / 2011 Concrete Materials 2011*, pp 50-58, 10.3141/2240-08.
 32. Yu, X.B., Liu, Y., Gonzalez, J. and Yu, X. (2010). A new TDR sensor for accurate freeze–thaw measurement, *International Journal of Pavement Engineering*, Volume 13, Issue 6, December 2012, pages 523-534.
 33. *Zhang, B., Yu, X.B. and Yu, X. (2010). Design and Simulation of A Distributed Moisture Sensor, *Smart Materials and Structures*, ISSN:1738-1584 ; VOL.6; NO.9; PAGE.1007-1023; (2010).
 34. *Yu, X.B., Liu, N., Penner, V. and Yu, X. (2010). Comparison of Three Technologies for Freezing-Thawing Measurement, *Journal of Advances in Civil Engineering*, Volume 2010 (2010), Article ID 239651, 10 pages.
 35. *Yu, X.B. and Yu, X. (2011). Assessment of An Automation Algorithm for TDR Bridge Scour Monitoring System, *Journal of Advancement in Structural Engineering*, ISSN 1369-4332, Feb2011, Vol. 14 Issue 1, p13.
 36. *Yu, X.B. and Yu, X. (2011). Development and Evaluation of An Automatic on Algorithm for TDR Bridge Scour Monitoring System under Various Conditions, *Canadian Geotechnical Journal*, Feb2011, Vol. 48 Issue 1, p26.
 37. *Yu, X.B. and Yu, X. (2010). Laboratory Evaluation of Time Domain Reflectometry for Bridge Scour Measurement: Comparison with the Ultrasonic Method, *Journal of Advances in Civil Engineering*, vol. 2010, Article ID 508172, 12 pages, 2010. doi:10.1155/2010/508172.
 38. Chen, R.P., Chen, Y.M., Xu, W. and Yu, X. (2010). Measurement of electrical conductivities of pore fluid of saturated sandy soils using TDR measurements, *Canadian Geotechnical Journal*, 47(2), 197-206(10)
 39. *Yu, X.B. and Yu, X. (2009). Time Domain Reflectometry Automatic Bridge Scour Measurement System: Principles and Potentials, *Structural Health Monitoring Journal*, 8(463), 463-476.

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40. *Yu, X.B., Liu, N., **Yu, X.** and Li, N. (2007). Sensor Technology for Decision Support of Spring Load Restrictions, *Journal of Transportation Research Record*, Volume 2053 / 2008 Geology and Properties of Earth Materials 2008, ISSN 0361-1981 17-22.
 41. Huang, Y.W. and **Yu, X.** (2007). Reconnaissance of New Orleans Levee System Failure and Its Implications for Levee System Design, *The Chinese Journal of Ocean Engineering*, 26(2), 112-118.
 42. Chen R.P., Drnevich, V.P., **Yu, X.** and Nowack, R.L. (2007). Water Content Measurements with Time Domain Reflectometry in Highly Conductive Soils Using Reflections from the Soil Surface, *ASCE Journal of Geotechnical and Geoenvironmental Engineering*, ISSN 1090-0241, 133(2), 1597-1608.
 43. **Yu, X.**, Zhou Y.F., and Peng S.Z (2005). Stability Analysis of Gravity-Arch Dam Abutments by 3D Elasto-Plastic Finite Element Method, *the International Journal of Rock Mechanics and Mining Science*, 42 (2005), 415-430.
 44. Drnevich V.P., Ashmawy, A.K., **Yu, X.** and Sallan, A.M. (2005). Time Domain Reflectometry for Water Content and Density of Soils: Sensitivity Analysis of Soil-Dependent Coefficients, *Canadian Geotechnical Journal*, 42(4), 1053-1065.
 45. **Yu, X.** and Drnevich, V. P. (2004). Density Compensation of TDR Calibrations for Geotechnical Applications, *Journal of ASTM International*, DOI: 10.1520/JAI12190, 16p.
 46. **Yu, X.** and Drnevich, V. P. (2004). Time Domain Reflectometry for Compaction Control of Stabilized Soils, *Journal of Transportation Research Record*, No. 1868, 14-22.
 47. **Yu, X.** and Drnevich, V. P. (2004). Soil Water Content and Dry Density by Time Domain Reflectometry, *Journal of Geotechnical and Geoenvironmental Engineering*, Vol. 130, No.9, 922-934.
 48. **Yu, X.** (2004). Field Evaluation of Ground Stiffness by Static and Dynamic Tests, *Electronic Journal of Geotechnical Engineering*, Volume 9, Bun. D, Paper No. 0434.
 49. **Yu, X.**, Yang H.P., and Wang, Z.X. (2000). Three Dimensional Seismic Response Analysis of Spillway, *Hydro Science and Engineering*, ISSN1001-3962, No.3, pg. 22-26.
 50. Wang Z. X., **Yu, X.**, and Niu, L. (1998). 3-D imitation for Pre-stressed Concrete Snail Shell, *Industrial Construction*, ISSN 1000-8993, No. 6, pg. 34-37.
 51. Wang Z. X., **Yu, X.**, Niu, L., and Niu, X.G. (1998). *Three-dimension Finite Element Structure Analysis on Pre-stressed Concrete Spiral Case*, Journal of Hydropower, ISSN 0559-9342, No. 4, pg. 27-29.

Papers Under Review

1. Wu, G.X. and Yu, X. (2014). A Holistic 3D Finite Element Simulation Model for Thermoelectric Power Generator Element, *Journal of Applied Physics*, under review
2. Hu, J.Y. and Yu, X. (2013). Innovative Thermochromic Asphalt Binders: Characterization and Thermal Performance, *Construction and Building Materials*, under review
3. Hu, J.Y., Gao, Q. and Yu, X. (2013) Characterization of the Optical and Mechanical Properties of Innovative Multifunctional Thermochromic Asphalt Binders, *Journal of Materials in Civil Engineering*, under review
4. Tao, J. and **Yu, X.** 2012. CFD Modeling for Flow and Scour around Bridge Piers—A review. *Journal of Hydro-environment Research*. (Revision under review)
5. Tao, J. and **Yu, X.** 2012. Bio-inspired Hair Sensor with Piezoelectric Microfiber and Spiral Electrodes. *IEEE Sensors Journal*. (Revised under review)
6. Gao, Q., Tao, J., Hu, J. and **Yu, X.** 2012. Experimental Study on Mechanical Behavior of Anisotropic Shale. *Journal of Geotechnical and Geological Engineering*. (under review)
7. Tao, J. and **Yu, X.** 2013. Effects of Pier Configurations on the Flow Pattern and Scour: CFD Modeling and Practical Implications. *International Journal of Computational Fluid Dynamics*. (under review)

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89. Zhang, B. and **Yu, X.** (2007). Influence of Diameter on the Bearing Capacity of Lateral Loaded Drilled Shaft, Proceedings of the 32th Deep Foundation Institute Annual Conference, Colorado, 10p.
90. Yu X.B. and **Yu. X.** (2007). Measurement of Modulus Reduction using Electromagnetic and Seismic Waves, Proceedings of the 86th Transportation Research Board Annual Conference, Paper #07-2473, 18p.
91. Yu, X.B. and **Yu, X.** (2007). Bridge Scour Surveillance Using Guide Electromagnetic Wave Technology, Proceedings of the World Forum on Smart Structure and Smart Materials Technology (SMSST), Nanjing, China, 4p.
92. Yu, X.B. and **Yu, X.** (2006). NDE Technologies for Bridge Inspection: A Review of the State of Practice, Highway Geophysics NDT Conference, Missouri, 10p.
93. Zambran C., Drnevich, V.P., **Yu, X.**, and Robert L. (2006). Soil Texture Characterization from TDR Waveform Analysis, TDR2006, 3rd International Conference on Innovative Applications of TDR technology, West Lafayette, IN., 18p.
94. **Yu, X.**, Vincent P. Drnevich and Robert L. Nowack (2006). An Improved Soil Dielectric Mixing Model for Inversion Analysis of Time Domain Reflectometry Measurements, TDR2006, 3rd International Conference on Innovative Applications of TDR technology, West Lafayette , IN., 12p.
95. Yu, X.B. and **Yu, X.** (2006). Time Domain Reflectometry Measurement of Multilayered Soils, TDR2006, 3rd International Conference on Innovative Applications of TDR technology, West Lafayette, IN., 10p.
96. Yu, X.B. and **Yu, X.** (2006). Measurement of Simulated Scour and Sedimentation by Time Domain Reflectometry, TDR2006, 3rd International Conference on Innovative Applications of TDR technology, West Lafayette , IN. , 10p.
97. **Yu, X.** and Yu, X.B. (2006). Vibration-based System for Pavement Condition Evaluation, The 9th International Conference on Applications of Advanced Technology in Transportation (AATT'2006), Chicago, IL, 8p.
98. Drnevich, V.P., **Yu, X.** and Zambrano, C.E. (2006). Refined Calibration Procedures for the One-Step Method, Geo-congress 2006, Geotechnical Engineering in the Information Technology Age, Atlanta, CA., Don J. DeGroot, (editor), Jason T. DeJong, (editor), David Frost, (editor), and Laurie G. Baise, 8p.
99. **Yu, X.** (2006). Design of Impact Test System for Pavement Subgrade Evaluation, Proceedings of ASCE Geo-congress, Geotechnical Engineering in the Information Technology Age, Atlanta, CA., Don J. DeGroot, (editor), Jason T. DeJong, (editor), David Frost, (editor), and Laurie G. Baise, 8p.
100. **Yu, X.** and Drnevich, V.P. (2006). Information Technology for Future Field Instrumentation System: Opportunities and Challenges, Geotechnical Engineering in the Information Technology Age, Atlanta, CA., Don J. DeGroot, (editor), Jason T. DeJong, (editor), David Frost, (editor), and Laurie G. Baise, 8p.
101. **Yu, X.** (2005). Seismic Structure-Foundation Interaction Analysis of A Spillway, 8 th U.S. National Conference on Earthquake Engineering, 18-22 April 2006, San Francisco, California, 8p.
102. **Yu, X.** (2005). Frequency versus Time Domain Simulation of Nonuniform TDR System, Proceedings of the 35th European Microwave Conference, October, 2005, Paris, France., 4p.
103. **Yu, X.**, Drnevich, V.P. and Nowack, R.L. (2004). Statistic Comparison of Models for Dielectric Spectrum of Soil

Mixtures, 2005 Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP), pp215-225, Atlanta , Georgia .

104. **Yu, X.**, Drnevich, V. P., and Olek J. (2004). Time Domain Reflectometry for Prediction of Strength Development of Concrete, the Proceedings of the 2004 International Symposium: Advances in Concrete through Science and Engineering, Evanston , Illinois , March 21-24, 2004.
105. **Yu, X.**, Drnevich, V. P. and Olek J. (2004). Time Domain Reflectometry for Measuring Water-Cement-Ratio of Concrete, the Proceedings of the 2004 International Symposium: Advances in Concrete through Science and Engineering, Evanston , Illinois , March 21-24, 2004.
106. **Yu, X.**, Drnevich, V.P. and Nowack, R.L. (2004). Comprehensive Evaluation of Near Surface Soil Properties by Combining Electromagnetic Wave and Seismic Wave Method, 16th International Conference on Soil Mechanics and Geotechnical Engineering (ICSMGE), Osaka , Japan.
107. **Yu, X.**, and Peng, S.Z. (2004). Three Dimensional Free Surface Seepage Analysis by Thermal Simulation, The Proceedings of the Six World Congress on Computational Mechanics in conjunction with the Second Asian-Pacific Congress on Computational Mechanics.
108. Drnevich, V. P., **Yu, X.** and Lovell, J. (2002)/ Time Domain Reflectometry for Water Content and Density of Soils: Test Procedures and Typical Results, TRB 82nd annual meeting, CD –ROM in 2003.
109. Drnevich, V. P., **Yu, X.** and Lovell, J. (2002). A New Method for Water Content and Insitu Density Determination, Proceedings of the Great Lakes Geotechnical and Geoenvironmental Conference, Toledo, Ohio, 2002.
110. Drnevich, V. P., **Yu, X.** and Lovell, J., Tishmack, J. (2001). Temperature Effects on Dielectric Constant Determined by Time Domain Reflectometry, TDR2001, Second International Symposium and Workshop on Time Domain Reflectometry for Innovative Geotechnical Applications, Infrastructure Technology Institute, Northwestern University, Evanston, IL., 2001.
111. **Yu, X.** and Green, R. (2008). The Performance and Economic Benefits of Thick Granular Base for Flexible Pavement Design in Ohio, 2008 Mid-Continent Transportation Research Forum, August 14-15, Madison, WA.
112. **Yu, X.** (2008). Effects of Freeze-Thaw on Pipe-Line Fracturing, World Environment and Water Resource, World Environmental & Water Resources Congress 2008, May 12-16, Hawaii.
113. **Yu, X.**, Yu, X.B., and Zhang, B. (2008). The Effects of Magnetic Components on the Cohesion of Lunar Soils, 11th International Conference on Engineering, Science, Construction, and Operations in Challenging Environments, March 3-5, Long Beach, CA
114. Yu, X.B., Liu, N. and **Yu, X.** (2007). Sensitivity and Economic Analyses of Perpetual Pavement, ASCE 18th Engineering Mechanics Division Conference, June 2-6, 2007.
115. **Yu, X.**, Yu, X.B. and Zhang, B. (2007). Microwave Magnetic Properties of Dust and Its Implication for Geophysics and Cohesion, NASA Workshop on Science Architecture for Lunar Exploration, February, Arizona.
116. **Yu, X.** and Wang, Z.X. (2005). Use of Pre-stressed Concrete Spiral Case for Middle Level Hydropower Station, International conference on Energy, Environment and Disasters (INCEED 2005)-Bridging the Gaps for Global Sustainable Development.
117. **Yu, X.** (2005). Parametric Frequency Estimation for Damage Detection, Proceedings of the 2005 ASME/ASCE/SES Joint Conference on Mechanics and Materials (McMat), Baton Rouge , Louisiana , June 1-3, 2005.

PATENTS AND COPYRIGHT

1. A non-contact ECG and EEG Sensor (with Ye Sun and Jim Berilla). U.S. Patent 2012/0265080 A1, Oct. 18, 2012.
2. An Innovative Distributed Strip Time Domain Reflectometry Sensor, U.S. patent application in processing, 2009

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3. Algorithms and computer codes for determining reflection points in Time Domain Reflectometry (TDR) Signals (with V.P. Drnevich), Applied for June 21, 2001, approved on October 25, 2001
 4. One-Step Method for Measuring Water Content and Density of Soil (with V.P. Drnevich), Purdue University, May 2002, P-02034, U.S. Patent 7,040,145, issued May 9, 2006.
 5. Water Content, Cement Content, Water-Cement Ratio, and Compressive Strength of Concrete from Time Domain Reflectometry, (with V.P. Drnevich), Purdue University, U.S. Patent 7,289,916 B2, Oct. 30, 2007.

Invention disclosures

6. Broadband photocatalytic cement-based coating, invention disclosure
7. A thermoelectric energy harvesting system from pavement structure (with G.X. Wu), invention disclosure
8. Thermochromic materials modified asphalt for durability extension and energy efficiency (with J.Y. Hu), invention disclosure
9. An acoustic source tracking system (with J.L. Tao), invention disclosure
10. Corrosion protection system based on microbial fuel cell, invention disclosure

INVITED TALKS

1. “Multi-scale & Multi-physical Process in Porous Materials & its Potential Roles in Addressing the Challenges in Sustainability, Energy Efficiency & Environment”, Department of Materials Science and Engineering Colloquia, Feb 1st, 2011
2. “Integration of Waves into Engineering Decisions”, School of Civil Engineering, China University of GeoSciences, Beijing, June 8, 2010
3. “Innovative NDT Technologies to Support Engineering Decisions”, Department Seminar, Ohio University, June 2009
4. *Keynote Speaker*, US-China Workshop on Infrastructure Materials “Recent Progresses in Understanding the C-S-H Gel Nanostructure and Its Implications for Developing Multifunctional Applications”, Beijing, China, Oct 2008
5. “Emerging NDT Technologies for Civil Infrastructure”, Presentation at Hebei University of Technology on NDT Technologies, Oct 2008
6. “Current Practice and Future Trend in Deep Foundation Testing Technologies”, Department Seminar, Tongji University, May 2008, Shanghai, China.
7. “New Developments and Potentials of Time Domain Reflectometry (TDR) for Soils, Concrete, and Structures”, Department Seminar, University of Minnesota-Twin City, Oct 27, 2007, Minneapolis, MN
8. “New Developments and Potentials of Time Domain Reflectometry (TDR) for Soils, Concrete, and Structures”, City College of New York, 2007, NY
9. “New Developments and Potentials of Time Domain Reflectometry (TDR) for Soils, Concrete, and Structures”, Tongji University, May 2007, Shanghai, China
10. “New Developments and Potentials of Time Domain Reflectometry (TDR) for Soils, Concrete, and Structures”, Shanghai University, May 2007, Shanghai, China
11. “New Developments and Potentials of Time Domain Reflectometry (TDR) for Soils, Concrete, and Structures”, Tsinghua University, May 2007, Beijing, China
12. “New Developments and Potentials of Time Domain Reflectometry (TDR) for Soils, Concrete, and Structures”, Zhejiang University, May 2007, Hangzhou, China
13. “Bridge Scour Measurement: Comparison of TDR and Ultrasonic Method”, University of Missouri Rolla, Oct 5,

2006

14. Bio-Inspiration: An Important Resource for Sensor and System Innovation, the International Workshop on Smart and Resilient Transportation Infrastructure, Virginia Tech, April 16, 2012
15. Multi-physical process in geo-materials and its role in infrastructure sustainability, Geotechnical Engineering Seminar, the University of Michigan, An Arbor, February 8, 2012
16. Recent Progresses in Unconventional Gas Development, Qihai, China, August 4, 2012
17. Innovative Sensor Technology for Engineering Decision Support, China Water and Hydropower Research Institute, August 3, 2012
18. Multi-physics Processes in Geomaterials Relevant to Infrastructure Sustainability and Energy Supplies, China Academy of Science-Engineering Mechanics Institute, July 31, 2012
19. Building Platforms: Construct A Solid Foundation for Civil Engineering Innovations, Georgia Institute of Technology, April 2, 2012
20. Overview of Bio-Inspired Sensor Research at Case Western Reserve University, US-Japan Workshop on Bio-inspired Sensor, Berkeley, CA, Nov 12, 1011
21. Multi-physics Processes in Geomaterials Relevant to Infrastructure Sustainability and Energy Supplies, Zhejiang University, August 15, 2012
22. Multi-physics Processes in Geomaterials Theoretical Basis and Engineering Applications, Tongji University, August 18, 2012
23. Sustainable Transportation Infrastructure on Frozen Ground, IS-GeoTrans 2012, International Symposium on Geotechnical Engineering for High Speed Transportation Infrastructure, October 25, 2012

COURSE TAUGHT

Typically three courses per year

- ECIV330 Soil Mechanics Laboratory
- ECIV430 Field Instrumentation and Insitu Testing
- ECIV601 Independent Study
- ECIV360 Civil Engineering Systems
- ECIV 431 Pavement Design and Analysis
- ECIV701 Ph.D. Dissertation

ADVISING AND MENTORING

Post-Doctoral Fellows/Visiting Scientists

- Nina Liu, Lecturer, Chang'an University, China, December 2007- December 2008
- Changjiang Wu, visiting student, Tongji University, China, November 2008- February 2009
- Seung-ho Lim, visiting scholar, Republic of Korea, December 2009-June 2010
- Bin Zhang, Associate Professor, China University of Geosciences, August 2009- July 2010
- Chih-ping Lin, Professor, National Chao-Tung University, July 2010-January 2011
- Hai Jin, Associate Professor, Xiamen University, Jan 2010-Dec 2011
- Yuhua Cao, Associate Professor, Southern Agricultural University, Jan 2012-June 2012

Ph.D. students

Current students

Name	Status	Research topics
1. Ye Sun (Electrical Engineering)	Ph.D. Candidate, started in August 2009	Innovative sensors for physiological signals

and Computer Science)		
2. Guangxi Wu (Electrical Engineering and Computer Science)	Ph.D. Candidate, started in August 2010	Sensor technology for building automation and energy efficiency
3. Chih-Chien Kung (Chemical Engineering) co-advise with Dr. C.C Liu	Ph.D. Candidate, started in August 2010	Smart materials for health and energy
4 Quan Gao	Ph.D. Candidate, Fall 2011	Sensor for seismic hazard research
5 Jianying Hu	Ph.D. Candidate, Fall 2011	Building materials and technologies
6 Yang Yang	Ph.D. student, Fall 2012	
7 Jiale Li	Ph.D. student, Fall 2013	
8 Chanjuan Han	Ph.D. student, Fall 2013	
9 Yuan Guo	Ph.D. student, Fall 2013	
10 Nuha Abobkr	M.S. student, Summer 2013	

Past Students

Name	Graduate Status	Research and Achievements
1. Xinbao Yu, Ph.D.	Graduated in 2009 currently assistant professor at University of Texas, Arlington	<ul style="list-style-type: none"> • Developing bridge scour monitoring system and analyses algorithm • Eisenhower Transportation Fellowship (twice) • The Roy Harley Prize of Promising Graduate Student • NSF travel grants • More than 30 papers in referred journal and conference proceedings
2. Bin (Ben) Zhang	Graduated in Fall 2011 Current work at Michael Baker Jr. Inc.	<ul style="list-style-type: none"> • Multi-scale multiphysical characterization and simulation of early stage concrete behaviors • The Roy Harley Prize of Promising Graduate Student • NSF travel grants • Graduate senator • More than 20 publications based on research activities
3. Yan Liu	Graduated in Fall 2010, Worked at GRL/Pile Dynamics Inc. and Michael Baker Jr. Inc. will be Assistant Professor at Mount Union University	<ul style="list-style-type: none"> • Development of Innovative NDT technology for QA/QC of concrete • NSF travel grants • Case research showcase poster award • The Roy Harley Prize of Promising Graduate Student • More than 10 publications in referred journals and conference proceedings
4. Zhen Liu	Postdoctoral Research	<ul style="list-style-type: none"> • Study the freezing effects and multiphysics processes

	Associate, 2012-2013 Ph.D. candidate, started in August 2008, graduated in fall 2012 currently Assistant Professor at Michigan Technological University	on geomaterials <ul style="list-style-type: none"> • NSF travel grants • A number of graduate student awards • Presentations at workshops • An impressive number of publications in journal and conference proceedings
5. Junliang Tao	Ph.D. candidate, started in August 2009, graduated in summer 2013 currently Assistant Professor, the University of Akron	<ul style="list-style-type: none"> • Turbulence sensing and simulations with engineering implications • NSF travel grants • A number of graduate student awards • An impressive number of publications in journals and conference proceedings

Research advisor for MS students

Nuha Abobkr, MS student, May 2013 (planned)
John Holman, MS student, Dec 2012
Randall Beck, BS/MS student, May 2008,
Donald Cartwright, BS/MS student, August 2008

Thesis Committee Member

Caleb Krouse, M.S., 2006, Civil Engineering
Louis Burnoski, M.S., 2007, Civil Engineering
David Ojala, M.S., 2007, Civil Engineering
Gang Liu, Ph.D., 2007, Civil Engineering
Heather Oravec, Ph.D., 2008, Civil Engineering
Chunmei He, Ph.D., 2009, Civil Engineering
Bo Li, Ph.D., Ph.D., 2010 Civil Engineering
George Sunny, Ph.D., Mechanical and Aerospace Engineering, 2010
Hao Qu, Ph.D. student, Materials Science and Engineering
Grant McCallum, Ph.D., Electrical Engineering and Computer Science, 2011
Henry Milliman, Ph.D., Macromolecular Science and Engineering, 2011
Guodong Chen, Ph.D., Mechanical and Aerospace Engineering “ “
Yuxin Wang, Ph.D., Macromolecular Science and Engineering
Al-Rawashdeh, Abdalla Ohio University, Ph.D., Civil Engineering, “Performance Assessment of Warm Mix Asphalt (WMA) Pavements in Presence of Water by Using Nano scale Techniques, and Traditional Laboratory Tests
Hao Qu, Materials Science and Engineering
Jin Qin, M.S., Civil Engineering
Xuefei Wang, M.S., Civil Engineering

Research advisor for undergraduate Students

Grant Mott (junior), Fall 2005,
Alan Baribault (junior), Summer 2006,
Vanessa Penner (woman, junior), Summer 2006,
Joseph Brenner (senior), Fall 2006,
Javanni Gonzalez (freshman), Spring 2006-Spring 2007,
Ben Ma (junior), Summer 2007,
Rebecca Ciciretti (freshman), Spring 2006-Spring 2007,
Alex Potter-weight (junior), Summer 2008,
Jingsi Lang (junior), Summer 2008, *Jingsi won the 2009 best student paper award by the Ohio Transportation Consortium,*
Vanessa Penner (senior), Summer 2008,
Randy Beck (senior), Fall 2008,

Peter Frank (minority), Summer 2008, *Peter's research poster was selected to present at 2009 Grand Challenge Summit of the National Academies*,
Yuan Gao (sophomore), Spring 2009,
Pete Simko (junior), Summer 2009,
Jonathon Farget (senior), Summer 2009, *Jonathon was nominated as the 2009 Student of the Year award by the Ohio Transportation Consortium of University Transportation Center program*,
Paul Manglona, Jr. (junior), Summer 2009,
Cassandra Madaddan (senior), Summer 2009,
Wenjie Xia (junior), Summer 2010,
Yuan Gao (junior), Summer 2010,
Mark Richardson (sophomore), Summer 2010

PROFESSIONAL ACTIVITIES

Professional and National

Conference Organization/Technical Committee Members

TDR2006 International Conference on Innovative TDR Technology for Soils, 2006

GeoRisk Specialty Conference 2011

In-Situ Testing and Site Geo-Characterization Specialty Conference (under planning for 2013/2014)

The 17th GLGGC Annual Conference, conference chair

IS-GeoTrans2012, International Symposium on High Speed Transportation Infrastructure, conference co-chair

The 3rd IACIP Annual workshop, conference chair

Session/Track Chair

Session Chair, Joint ASCE/ASME Conference on Materials (McMAT 2005),

Session Chair, ASCE GeoCongress 2006

Session Chair, ASCE GeoDenver 2007,

Session Chair, First North American Landslides Conference, 2007

Session Chair, GeoCongress 2009

Session Chair, SPIE 2010

Track Chair, GeoShanghai Conference 2010

Session Chair, ASME 2010

Session Chair, GeoFrontier 2011

Reviewer of Proposals for Funding Agency

National Cooperative Highway Research Program (NCHRP 24-34) Expert Group Member

Strategic Highway Research Program (SHRP 2)-Expert Task Group member

NASA Proposal Reviewer

NSF Proposal Review Panel for a variety of CMMI divisions (i.e., Sensor and Sensing Systems, Infrastructure

Materials and Mechanics, Geotechnical Engineering, Major Research Instrument)

Reviewer of Journal Manuscripts

Geotechnical Testing Journal

Journal of ASTM International

Journal of Geotechnical and Geoenvironmental Engineering

Journal of Materials in Civil Engineering

Journal of Physics and Chemistry of Solids

Canadian Journal of Civil Engineering

Canadian Geotechnical Engineering Journal

Journal of Vibration and Control

Journal of Advancement in Civil Engineering

Journal of Bridge Engineering

International Journal for Numerical and Analytical Methods in Geomechanics

Journal of Testing and Evaluation

Journal of Environmental & Engineering Geophysics
Smart Structures and Systems
Construction and Building Materials
Journal of Hydrology
Korean Journal of Civil Engineering
Structural Engineering and Mechanics
Engineering Geology
International Journal of Pavement Engineering
Journal of Bridge Engineering
Journal of Composites B: Engineering
Sensors Journal
Acta Geotechnica
IEEE Sensor Journal
Science Magazine

Reviewer for Conference Manuscripts

ASCE GeoFrontier 2011,
ASCE GeoShanghai 2010,
ASCE GeoFlorida 2010,
ASCE GeoFlorida 2009,
ASCE GeoNew Orleans 2008,
ASCE GeoCongress 2006,
ASCE GeoDenver 2007,
Transportation Research Board (TRB) 89th annual conference,
Transportation Research Board (TRB) 88th annual conference,
Transportation Research Board (TRB) 87th annual conference,
Transportation Research Board (TRB) 86th annual conference,
First North American Landslides Conference,
Joint ASCE/ASME Conference (McMAT 2005),
TDR2006 International Conference,
Great Lakes Geotechnical and Geoenvironmental Conference (GLGGC) 13th annual conference,
Decennial Geotechnical Earthquake Engineering and Soil Dynamics (GEESD) Conference

University

- Facilitated the Case School of Engineering junior faculty Peer Mentoring lunch meeting as part of the CWRU Academic Careers in Engineering and Science (ADVANCE) program – *Spring 2007-Summer 2008*
- Spearheaded the development and implementation of an international collaborative educational (2+2) program between CWRU and Hebei University of Technology of China under the direction of Dr. Donald Feke, Vice Provost for Undergraduate Education, with advice from Dr. C.C. Liu, Professor of Chemical Engineering, and with the support of Civil Engineering department faculty – *June, 2007 to present*
 - Initialized the discussion and refinements on the terms of agreement (which was signed by presidents of both universities in Summer 2008).
 - Prompted CWRU among HUT students by presenting an invited seminar in October, 2008.
 - Led the discussions on syllabi exchange
 - Mentored the first tier of students (since Fall 2009).
- Regular participation of WISER program and give instructions during the ‘introducing a girl to engineering’

Case School of Engineering

- Case School of Engineering Committee
 - Research Committee 2005-2007
 - Research Committee 2007-2009
 - Graduate Studies Committee 2007-2008
 - Undergraduate Studies Committee 2008-2010
 - Engineering Core Committee 2010-2011

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- Faculty hiring committee: advanced materials, 2011-2012
 - Faculty hiring committee: multiscale modeling cluster, 2012-present
 - CSE budget committee 2012-present
 - CSE Strategic plan implementation committee, 2011-present

Department

- Help provide laboratory demonstrations to K-12 students and freshman students during Department open house, choice fair, etc, 2006, 2007, 2008, 2009
- Case ASCE Student Chapter Faculty Advisor, 2008-present. the Case ASCE Student Chapter received honorable mention by ASCE National Society for activities and report in 2010
- Department of Civil Engineering faculty search committees, 2010

PRESENTATIONS AT CONFERENCES AND WORKSHOPS

1. The research group presented 5 research papers at the TRB annual conference in January 2014
2. The research group presented 7 research papers/posters at the TRB annual conference in January 2013
3. New Ideas for Evaluation of High Capacity Deep Foundation, Midwest Geotechnical Conference, Columbus, OH, September 26, 2012
4. 2 Presentations at ASCE Geo-Congress 2012
5. Presentation of 2 research papers at the 8th International Workshop on Structural Health Monitoring (IWSHM), Stanford, CA
6. Presentation of 2 research papers at the GeoRisk 2011 annual conference, Atlanta, GA
7. Presentations of five research papers at the Transportation Research Board 90th Annual Conference, Washington, DC, January 2011
8. Presentations of five research posters at the NSF CMMI Research and Innovation Conference, Atlanta, GA, January 2011
9. “Seismic CPT for Design on Existing Foundation”, Presentation at GeoShanghai 2010 International Conference, Shanghai, China, June 2010
10. “Coupled Hydro-Thermo-Mechanical Modeling of Freezing Soils”, International Workshop on Multiscale Multiphysical Processes, Stanford University, May 2010
11. Six research posters at the CWRU Research Showcase presented by Dr. Yu and Students: “Sensitivity Analysis of the Orientation of Orthotropic on the Mechanical Response of Layered Cylinder Structure” (presented by Bin Zhang), “Design and Performance Evaluation of Thermo-Time Domain Reflectometry Probe for Thermal Properties of Geomaterials” (presented by Bin Zhang), “Innovative Ultrasonic Technology for the Performance Properties of Infrastructure Materials” (presented by Yan Liu), “Measurement and Evaluation of Driving Fatigue Based on Electrocardiography and Electroencephalography” (presented by Ye Sun), “Design and Evaluation of A Bio-Inspired Micro Flow Sensor using Micro Pillar Arrays” (presented by Junliang Tao) and “Modeling frost-thaw within granular materials with innovative coupling field method” (presented by Zhen Liu), Cleveland, OH, April 2010
12. “A Microbial Fuel House-Design and Optimization of a MFC”, Presentation at SPIE Smart Structures/NDE Conference, San Diego, CA, March 2010
13. “Smart Pavement by Thermoelectric Energy Harvesting”, Presentation at SPIE Smart Structures/NDE Conference, San Diego, CA, March 2010
14. “A Bio-Inspired Turbulence Sensor”, Presentation at SPIE Smart Structures/NDE Conference, San Diego, CA, March 2010
15. “A Multiphysical Model for Freezing Effects on Soils”, Presentation at the TRB 89th Annual Conference, Washington DC, January 2010

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16. "Recent Research on Concrete and Geomaterials at CWRU", Presentation at the 12th ACBM/NIST Computer Modeling Workshop, Maryland, August 2009
 17. "An innovative bridge scour monitoring system", Presentation at ANCRiSST 2009, Boston, MA, August 2009
 18. "Parametric Frequency Estimation for Damage Detection", Presented at ANCRiSST 2009, Boston, MA, August 2009
 19. "Time Domain Reflectometry Bridge Scour Monitoring System", Presented at ODOT Research Office, April 2009
 20. Four presentations at NIST 20th ACBM/NIST Computer Modeling Workshop by Dr. Yu and students: "Recent Research on Materials Model and Characterization at CWRU" (presented by Dr. Yu), "Multiphysics Simulation of Cement Hydration" (presented by Bin Zhang), "Development and Implementation of Multiphysical Poromechanical Model for Porous Media" (presented by Zhen Liu), and "Modeling of Ultrasonic Wave Propagation in Infrastructure Material" (presented by Yan Liu), MD, August 2009.
 21. "The influence of Dynamic Components on the Bearing Capacity of Pile Foundation", Presentation and session chair for GeoCongress 2009, International Foundation Congress&Equipment Expo 2009 (IFCEE09), Orlando, FL, March 2009
 22. "Sustainability through beneficial utilization of lime sludge in construction", US-China workshop on ground improvement technology, Orlando, FL, March 2009
 23. Three podium presentations and one poster presentation at Transportation Research Board Annual Conference: "Assessment of the Automation Algorithm for TDR Bridge Scour Monitoring System under Various Conditions" (presented by Xinbao Yu), Development of Time Domain Reflectometry (TDR) Instrument for Fresh and Early Stage Concrete (presented by Yan Liu), Beneficial Use of Lime Sludge for Soil Stabilization (presented by Xiong Bill Yu), Instrument-Assisted Mechanistic Criteria to Prevent Freezing Damage of Early-Stage Concrete (presented by Xiong Bill Yu), An Distributive Moisture Sensor for SLR: Results of field pilot studyTwo presentations to TRB Committees (presented by Xiong Bill Yu), Washington DC, January 2009
 24. "Thick Granular Base for Pavement Design in Ohio", Presented at ODOT Office of Pavement Engineering, Dec 2008
 25. "Time Domain Reflectometry for Early Stage Concrete Quality Control/Quality Assurance", Presented for NCHRP-IDEA committee, June 2008
 26. "The magnetic components of lunar soils and their implications for cohesion", Earth and Space 2008 Conference, Long Beach, CA, April 2008
 27. "Modulus for Landing Analyses", Earth and Space 2008 Conference, Long Beach, CA, April 2008
 28. "An Automatic TDR Scour Monitoring System". Presented at ANCRiSST 2008, Tokyo, Japan, May 2008
 29. "Microbial Power House", Research Poster SURES Summer Research Program, by Peter Frank, Aug 2008
 30. Four poster presentations at CWRU Research showcase by Dr. Yu and Graduate Students Xinbao Yu, Bin Zhang, and Yan Liu, April 2008
 31. Three presentations at Transportation Research Board Annual Conference by Dr. Yu and Graduate Students Xinbao Yu, Bin Zhang and Yan Liu, Jan 2008 "An Innovative Strip Sensor for Subsurface Moisture Distribution", "New Technology and Analyses Methods for Accurate Freeze-thaw Measurements", and "Sensor Technology for Decision Support of Spring Load Restrictions", Washington DC, January 2010
 32. "A field worthy bridge scour monitoring system", the Ohio Transportation Engineering Conference, Oct 2007
 33. "NDT evaluation of unknown foundations", the Ohio Transportation Engineering Conference, Oct 2007
 34. "Effects of freezing on soil mechanical properties", Presentation at Ohio Academy of Science annual conference by Javanni, May 2008
 35. "Technology for accurate freeze-thaw measurement", Presentation at Ohio student research forum, July 2007

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36. "Monitoring Bridge Scour by Time Domain Reflectometry", World Forum on Smart Materials and Smart Structure Technology, May 2007, Nanjing, China
 37. "Technology for bridge scour measurement", Ohio Transportation Engineering conference, Oct 23, 2007, Columbus, OH.
 38. "Testing of Unknown Foundations with Geophysical Method", Ohio Transportation Engineering conference, Oct 22, Columbus, OH
 39. "Non-fine concrete for river channel erosion control", ASCE GeoDenver Conference, Feb. 2007, Denver, Colorado.
 40. "Microwave Magnetic Properties of Lunar Soils and Implications", NASA Workshop on Science and Technology for Lunar Exploration, Feb 2007, Phoenix, AZ.
 41. "NDE Technologies for Bridge Inspection". Highway Geophysics - NDE conference, December 4-7, 2006, St. Louis, Missouri
 42. "An Improved Dielectric Mixing Model for Inversion Analyses of the Dielectric Spectra of Soils". TDR 2006: 3rd International Symposium and Workshop on Time Domain Reflectometry for Innovative Soils Applications, September 17-20, 2006, Purdue University West Lafayette
 43. "Scour Measurement by Time Domain Reflectometry". TDR 2006: 3rd International Symposium and Workshop on Time Domain Reflectometry for Innovative Soils Applications, September 17-20, 2006, Purdue University West Lafayette
 44. "Time Domain Reflectometry Tests of Multilayered Soils ". TDR 2006: 3rd International Symposium and Workshop on Time Domain Reflectometry for Innovative Soils Applications, September 17-20, 2006, Purdue University West Lafayette
 45. "Time Domain Reflectometry for Evaluation of Simulated Scour", TRB Committee on Soils and Rock Instrumentation, TRB Annual conference, Jan 25, 2006
 46. "Measurement of Modulus Reduction using Electromagnetic and Seismic Waves". 86th TRB annual meeting, January 21-25, 2007, Washington, DC
 47. "Geophysical Methods for Unknown Foundation Determination: A Case in Savannah GA", 86th TRB annual meeting, January 21-25, 2007, Washington, DC
 48. "New Developments and Potentials of Time Domain Reflectometry (TDR) for Soils, Concrete, and Structures", Office of Research, Ohio Department of Transportation, Nov 18, 2005.
 49. "Statistical Comparison of Models for Dielectric Spectrum of Soil Mixtures", 2005 Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP), Atlanta, Georgia, April 2005.
 50. "Time Domain Reflectometry for Water Content and Dry Density", Purdue Geotechnical Society Workshop, West Lafayette, IN, May, 2004.
 51. "Time Domain Reflectometry for Prediction of Strength Development of Concrete", the 2004 International Symposium: Advances in Concrete through Science and Engineering, Chicago, IL, March, 2004
 52. "Time Domain Reflectometry for Measuring Water-Cement-Ratio of Concrete", the 2004 International Symposium: Advances in Concrete through Science and Engineering, Chicago, IL, March, 2004
 53. "Water-Cement Ratio and Concrete Quality by Time Domain Reflectometry", the 34th annual workshop of Michigan Concrete Paving Association, Troy, Michigan, Feb 2004
 54. "Time Domain Reflectometry for Compaction Control of Stabilized Soils", the 83rd Transportation Research Board annual meeting, Washington D.C., Jan, 2004.
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