
Curriculum Vita of Yunping Xi, Ph.D.

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Civil,
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Education

Ph.D. in Structural Engineering,
Northwestern University, Evanston, IL.
(1991).

M.S. in Structural Engineering, Central
Research Institute of Building and
Construction, Beijing (1985).

B.S. in Civil Engineering, Beijing Institute
of Civil Engineering and Architecture (1982).

Employment History

2005 – Present Professor, University of Colorado at Boulder
2000 – 2005 Associate professor, University of Colorado at Boulder
1997 – 2000 Assistant professor, University of Colorado at Boulder
1993 – 1996 Assistant professor, Drexel University
1991 – 1993 Research scientist, Northwestern University
1987 – 1988 Visiting scholar, Northwestern University
1985 – 1987 Structural engineer, Beijing Central Research Inst. of Building and Construction.
1982 – 1983 Structural engineer, Beijing Design Institute of Building and Construction.

Research

Research interests and fundings

(1) Theoretical analysis and experimental study on long term durability of cementitious materials and reinforced concrete structures, including creep, shrinkage, fracture, freeze/thaw, and alkali-silica reaction of concrete; high temperature damage and radiation effect on concrete; chemical and moisture transport in concrete; and chloride-induced corrosion of steel in concrete.

(2) Monitoring and simulation of long-term performance of reinforced concrete and steel structures. Development of simulation models for long-term deterioration processes in reinforced concrete structures, installing sensor network on concrete structures, and integrating simulation models and sensor network for utilization of monitoring data to calibrate model parameters in real time.

(3) Evaluation of existing nuclear power plant structures: containment structures and dry casks. Performance evaluation of protection systems for highway bridge decks:

sealers, thin-bonded overlays, waterproof membranes, and cathodic protection systems.

(4) Development of sustainable construction materials. Reutilization of various solid wastes in concrete such as fly ash, waste glass, waste tires, and recycled concrete. Applications of special additives in concrete, such as carbon nanotubes, optical fibers, forming agents, and phase change materials. Optimization of concrete mix designs.

Since 1993, Dr. Xi has participated more than 100 sponsored projects as PI or co-PI. The total funding is about \$15 million dollars as PI and co-PI. The following are lists of some of the research projects.

Ongoing projects

- 1 Federal Highway Administration and Colorado Department of Transportation “Colorado Local Technical Assistance Program for the Roadway Infrastructure System”, a long-term project from 1998 – present (PI).
- 2 Colorado Department of Transportation “Asphalt and Non-asphalt Waterproof Membranes”, 2013-2017 (PI).
- 3 Colorado Department of Transportation “Surface Chloride Level in Structural Concrete in Colorado”, 2013-2017 (PI).
- 4 Department of Energy/National Energy Technology Lab “Nanoparticle Injection technology for Remediating Leaks of CO₂ Storage Formation”, 2015-2018 (PI).
- 5 Department of Energy/Nuclear Energy University Program “Doubling the Life of Concrete Structures”, 2013-2016 (co-PI).
- 6 Department of Energy/Nuclear Energy University Program “Multiple Degradation Mechanisms in Reinforced Concrete Structures, Modeling and Risk Analysis”, 2015-2018 (co-PI).

- 7 Nuclear Regulatory Commission
“Radiation Effects on Concrete
Structures”, 2016-2019 (co-PI).

**Completed projects (partial list as PI or
co-PI, listed chronologically)**

- 1 New Jersey (NJ) DOT “Chloride
Permeability of Concrete with Silica
Fume and Other Admixtures”, 1996 –
1998 (PI: Y. Xi).
- 2 Ben Franklin Technology Center “Use of
Recycled Glass as Raw Material in the
Manufacture of Portland Cement”, 1996
– 1998 (PI: Y. Xi).
- 3 New York State Energy Research and
Development Authority (NYSERDA)
via. Columbia University “Use of
Recycled Glass and Fly Ash for Precast
Concrete Products”, 1995 – 1997 (PI: Y.
Xi).
- 4 Air Force “Dynamic Performance
Evaluation of Conventional and
Non-Conventional Concrete, 1997 –
1998 (PI: K. Willam; co-PI: Y. Xi).
- 5 CDOT “Roadway Safety Training”, 1998
– 2008 (PI: Y. Xi).
- 6 NSF “Accelerated Testing and Reliable
Modeling of Concrete Durability under
Coupled Environmental and Mechanical
Loadings”, sponsored by National
Science Foundation, 1998 – 2002 (PI: Y.
Xi; co-PIs: K. Willam, and D.M.
Frangopol).
- 7 NSF “Research Equipment Grant:
Upgrade of the materials testing system”,
1998 – 1999 (PI: Y. Xi; co-PIs: B. Shing,
and K. Willam).
- 8 Federal Aviation Administration (FAA)
“Fiber Optic Sensor Monitoring and
Earthquake Analysis of TRACON
Facility at Denver International Airport”,
1998 – 2001 (PI: S. Sture; co-PI: Y. Xi).

- 9 CDOT “Evaluation of CDOT current and Potential Steel Corrosion Protection Measures”, 2000 – 2002 (PI: Y. Xi).
- 10 Lockheed Martin via. Colorado Advanced Materials Institute (CAMI): “Evaluation of High-Temperature-Capable Fabric Materials”, 2000-2001 (PI: Y. Xi).
- 11 CTS Wireless “Frequency Shift of Piezoelectric Devices”, 2000 – 2002 (PI: Y. Xi).
- 12 CDOT “Evaluation of Fiber Reinforced Polymer Reinforced Bridge Decks”, 2000 – 2001 (PI: B. Shing; co-PIs: Y. Xi, and D.M. Frangopol).
- 13 CDOT “Field Investigation of Cracking in Newly Constructed Bridge Decks”, 2000 – 2002 (PI: Y. Xi).
- 14 NSF “NATO-NSF Workshop on Model-Based Simulation of Durability of Materials and Structures”, 2000 – 2002 (PI: Y. Xi).
- 15 CDOT “Comparative Study on Corrosiveness of Different De-Icing Agents: Magnesium Chloride, Sodium Chloride, and Caliber M1000”, 2001 – 2002 (PI: Y. Xi).
- 16 NSF “A Live-Data Simulation System and Applications to Highway Bridge Performance Prediction”, 2001 – 2005 (PI: X.C. Cai; co-PI: Y. Xi).
- 17 CDOT “Structural Testing and Monitoring by Fiber Optic Sensors of FRP Pedestrian Bridge in Denver O’Fallon Park”, 2002 – 2003 (PI: B. Shing; co-PIs: Y. Xi, and D.M. Frangopol).
- 18 Colorado Commission on Higher Education (CCHE) “High Toughness Rubber-Modified Concrete”, 2002 – 2003 (PI: Y. Xi).

- 19 CDOT “Materials, Testing Methods, and Construction Practices for Fast Concrete Desk Repair”, 2003 (PI: Y. Xi).
- 20 CDOT “Repair of Corrosion Damage and Wireless Monitoring of Corrosion Potential of Castlewood Canyon Arch Bridge in Denver”, 2003 – 2004 (PI: B. Shing; co-PIs: Y. Xi, and D.M. Frangopol).
- 21 NSF “Workshop on Interface Problems”, 2004 (PI: K. Willam; co-PI: Y. Xi).
- 22 Sandia National Laboratory (SNL): “Structural Integrity of Reinforced Concrete Building Complexes Subjected to High Temperature”, 2004 – 2005 (PI: K. Willam; co-PI: Y. Xi).
- 23 FHWA “Quantify Construction Delays Due to Weather” 2004 – 2007 (PI: Y. Xi; co-PIs: R. Balaji and K. Molenaar).
- 24 CDOT “Evaluate Performance of CDOT’s Systems for Protection of Colorado’s Reinforced Concrete Bridge Decks”, 2005 – 2007 (PI: G. Hearn; co-PI: Y. Xi).
- 25 Tokyo Electric Service Co. “Life Prediction in AAR Affected Structures and Confined AAR Expansion Test, Phase I and Phase II”, 2007 – 2008 (PI: V. Saouma; co-PI: Y. Xi).
- 26 National Science Foundation (NSF) “High Temperature Effects on Concrete Materials: A Multiscale Approach”, 2004 – 2008 (PI: K. Willam; co-PI: Y. Xi).
- 27 NASA “Refractory Materials Evaluation for Corrosion Protection of the KSC Launch Pad Flame Deflectors”, 2008 (PI: K. Willam; co-PI: Y. Xi).
- 28 Obayashi Corp “Background Survey and Evidential Research on Concrete Temperature Limits Specified in ASME

- Codes”, 2009 (PI: K. Willam; co-PI: Y. Xi).
- 29 Oak Ridge National Laboratory (ORNL) “Thermal Response of Reinforced Concrete Structures”, 2008-2009 (PI: K. Willam; co-PI: Y. Xi).
 - 30 Colorado Department of Transportation (CDOT) “Strategic Evaluation of Different Topical Protection Systems for Bridge Decks and the Associated Life-Cycle Cost Analysis”, 2007-2009 (PI: Y. Xi).
 - 31 Performance Improvement International (PII) “Unconventional Tests for a Nuclear Power Plant Containment Vessel”, 2009-2010 (PI: V. Saouma; co-PIs: Y. Xi, and M. Eck).
 - 32 Colorado Department of Public Health and Environment “Premixed Rubberized Insulation Mortar (PRIM)”, 2008-2010 (PI: Y. Xi).
 - 33 National Science Foundation “Penetration of Multi-Components De-icing Salts in Non-Saturated Concrete Structures”, 2007 – 2010 (PI: Y. Xi; co-PI: L.Y. Li).
 - 34 Colorado Department of Transportation “Application of Roller Compacted Concrete (RCC) in Colorado’s Roadways”, 2009-2011 (PI: Y. Xi).
 - 35 Colorado Department of Transportation “Evaluation and Monitoring of Performance of Bridge Deck Sealers”, 2008 to 2012 (PI: Y. Xi).
 - 36 Vestas Corp. “Panel Anchor Tests for Nacelle of Wind Turbine Towers”, 2012 (PI: Y. Xi).
 - 37 National Science Foundation “An Integrated Power Aware Sensor-Simulation Network System for Long-Term Performance Assessment of Concrete Infrastructures”, 2007 – 2013

(PI: Cai, X.C., co-PIs: Y. Xi, and R. Zane).

- 38 National Science Foundation
“Experimental Study and Theoretical Modeling of High Performance Recycled Aggregate Concrete”, 2009 – 2013 (PI: F. Vernerey; co-PI: Y. Xi).
- 39 Oak Ridge National Laboratory via University of Houston “Advanced Reactor Designs: Effect of Irradiation on Concrete Materials and Structures”, 2011 – 2013 (PI: K. Willam; co-PI: Y. Xi).
- 40 Korea Railway Research Institute
“Durability Issues on Concrete Materials with Carbon Nano Tubes (CNT)”, 2012-2013 (PI: Y. Xi).
- 41 Colorado Department of Transportation
“Evaluation of Thin Bonded Overlays as Cost Effective Bridge Deck Barriers and Reducing Bridge Construction Costs”, 2012-2014 (PI: Y. Xi).
- 42 Department of Energy/Nuclear Energy University Program “Concrete Materials with Ultra-High Damage Resistance and Self-Sensing Capacity for Extended Nuclear Fuel Storage Systems”, 2012-2015 (PI: M. Li; co-PIs: K. Willam, K. Nakshatrala, and Y. Xi).

Journal Articles (Peer-Reviewed)

- 1 Jiang, Z., Xi, Y., Gu, X., Huang, Q., and Zhang, W. (2016) “Mesoscopic Prediction of Cement Mortar Diffusivity by Analytical and Numerical Methods”, *J. of Materials for Civil Engineering*, ASCE, accepted for publication, 9/1/2016.
- 2 Musiket, K., Vernerey, F., and Xi, Y. (2016) “Numerical Modeling of Fracture Failure of Recycled Aggregate Concrete Beams under High Loading Rates”, *International Journal of Fracture*, doi:10.1007/s10704-016-0145-3.

- 3 Jiang, Z., Huang, Q.H., Xi, Y., Gu, X.L., Zhang, W.P. (2016) "Experimental Study of Diffusivity of Interfacial Transition Zone between Cement Paste and Aggregate", *J. of Materials for Civil Engineering, ASCE*, 28(10): 04016109; DOI: 10.1061/(ASCE)MT.1943-5533.0001637.
- 4 Homan, L., Ababneh, A., and Xi, Y. (2016) "The Effect of Moisture Transport on Chloride Penetration in Concrete", *Construction and Building Materials*, 125, 1189-1195.
- 5 Na, O., and Xi, Y. (2016) "Mechanical and Durability Properties of Portland Cement Insulation Mortar with Rubber Powder from Waste Tires", *Journal of Material Cycles and Waste Management*, DOI 10.1007/s10163-016-0475-2.
- 6 Na, O., Ou, E., Xi, Y., and Saouma, V. (2016) "The Effects of Alkali-Silica Reaction on Mechanical Properties of Concrete with Three Different Types of Reactive Aggregates", *Structural Concrete*, DOI: 10.1002/suco.201400062.
- 7 Musiket, K., Rosendahl, M., and Xi, Y. (2016) "Fracture of Recycled Aggregate Concrete under High Loading Rates", *J. of Material in Civil Eng., ASCE*, [10.1061/\(ASCE\)MT.1943-5533.0001513](https://doi.org/10.1061/(ASCE)MT.1943-5533.0001513), 04016018.
- 8 Zhang, W.P., Tong, F., Gu, X.L., Xi, Y. (2015) "Study on Moisture Transport in Concrete in Atmospheric Environment", *Computers and Concrete*, 16(5), 775-793.
- 9 Zhang, W.P., Min, H.G., Gu, X.L., Xi, Y., Xing, Y.S. (2015) "Mesoscale Model for Thermal Conductivity of Concrete", *Construction and Building Materials*, 98, 8-16.

- 10 Bai, Y., Harajli, A., Xi, Y. (2015)
“Analytical Solutions of Ionic Diffusion and Heat Conduction In Multi-Layered Porous Media”, *Journal of Applied Mathematics*, Vol. 2015, Article ID 208914, 11 pages,
doi:10.1155/2015/208914.
- 11 Damrongwiriyanupap, N., Limkatanyu, S., and Xi, Y. (2015) "A Thermo-Hygro coupled Model for Chloride Penetration in Concrete Structures", *Advances in Materials Science and Engineering*, vol. 2015, Article ID 682940, 10 pages,
doi:10.1155/2015/682940.
- 12 Damrongwiriyanupap, N., Li, L., and Xi, Y. (2014) “Temperature Effect on Multi-Ionic Species Diffusion in Saturated Concrete”, *Computers and Concrete*, 13(2), 149-171.
- 13 Nemecek, J., and Xi, Y. (2014)
“Nanoparticle Injection into Concrete Using Electromigration”, *Advanced Materials Research*, Vol. 1054, 6-10.
- 14 Wang, X., Rhee, I., Wang, Y., and Xi, Y. (2014) "Compressive Strength, Chloride Permeability, and Freeze-Thaw Resistance of MWNT Concretes under Different Chemical Treatments", *The Scientific World Journal*, Vol. 2014, Article ID 572102, 8 pages,
doi:10.1155/2014/572102.
- 15 Eskandari-Ghadi, M., Xi, Y., and Sture, S. (2014) “Cross-Property Relations Between Mechanical and Transport Properties of Composite Materials”, Technical note in *J. of Engineering Mechanics. ASCE*, 140(7), 06014006.
- 16 Liang, Y., Ye, Z., Vernerey, F., and Xi, Y. (2013). "Development of Processing Methods to Improve Strength of Concrete with 100% Recycled Coarse Aggregate." *J. Mater. Civ. Eng.*, ASCE, [10.1061/\(ASCE\)MT.1943-5533.0000909](https://doi.org/10.1061/(ASCE)MT.1943-5533.0000909), 04014163.

- 17 Meshgin, P., and Xi, Y. (2013) "Multi-scale Composite Models for Effective Thermal Conductivity of PCM-Concrete", *Construction and Building Materials*, 48, 371-378.
- 18 Eskandari-Ghadi, M., Zhang, W.P., Xi, Y., and Sture, S. (2013) "Modelling of Moisture Diffusivity of Concrete at Low Temperatures", *J. of Engineering Mechanics, ASCE*, 139(7), 903-915.
- 19 Kim, H.G., Lee, J.S., Cho, B.H., Kim, H.Y., and Xi, Y. (2013) "An Experimental Study on Fire Resistance of Modular Block", *International Journal of Steel and Composite Structures*, 15(1), 103-130.
- 20 Damrongwiriyanupap, N., Li, L.Y., and Xi, Y. (2013) "Coupled Diffusion of Multi-Component Chemicals in Non-Saturated Concrete", *Computers and Concrete*, 11(3), 201-222.
- 21 Meshgin, P., Li, Y., and Xi, Y. (2012) "Utilization of Phase Change Materials and Rubber Particles to Improve Thermal and Mechanical Properties of Mortar", *Construction & Building Materials*, 28, 713-721.
- 22 Meshgin, P., and Xi, Y. (2012) "The Effects of Phase Change Materials on Properties of Concrete", *ACI Material J.*, 109(1), 71-80.
- 23 Damrongwiriyanupap, N., Li, L.Y., and Xi, Y. (2011) "Coupled Diffusion of Chloride and Other Ions in Saturated Concrete", *Journal of Frontiers of Architecture and Civil Engineering in China*, 5(3), 267-277.
- 24 Damrongwiriyanupap, N., Liang, Y.C., Xi, Y. (2011) "Diffusion of Multi-Ionic Species in Recycled Aggregate Concrete", *Key Engineering Materials*, 477, 56-64.

- 25 Li, L.Y., Damrongwiriyanupap, N., and Xi, Y. (2011) "A Probabilistic Prediction Model for the Corrosion Initiation Time of Steel Reinforcement in Concrete Structures", *International Journal of Modelling, Identification and Control*, 14(1/2), 112-120.
- 26 Li, Y., Yan, Q., Xi, Y., and Meshgin, P. (2011) "Properties of Premixed Rubberized Insulation Mortar", *New Building Materials*, 2, 43-45 (in Chinese).
- 27 Apipattanavis, S., Molenaar, K.R., Rajagopalan, B., Xi, Y., Sabol, K.K., Blackard, B. Patil, S. (2010) "An Integrated Framework for Quantifying and Predicting Weather Related Highway Construction Delays, *Journal of Construction Engineering and Management*, ASCE, Nov., 1160-1168.
- 28 Lee, J.S., Xi, Y., Willam, K., and Jung, Y. (2009) "A Multiscale Model for Modulus of Elasticity of Concrete at High Temperatures", *Cement and Concrete Research*, 39, 754-762.
- 29 Lee, J.S., Xi, Y., and Willam, K. (2008) "Properties of Concrete after High Temperature Heating and Cooling", *J. of Materials, ACI*, July-Aug. 105(4), 334-341.
- 30 Suwito, A., and Xi, Y. (2008) "The Effect of Chloride-Induced Steel Corrosion on Service Life of Reinforced Concrete Structures", *Structure & Infrastructure Engineering*, 4(3), June 2008, 177 - 192.
- 31 Koller, R., Chang, S.Y., and Xi, Y. (2007) "Fiber Reinforced Polymer Bars under Freeze-Thaw Cycles and Different Loading Rates", *Journal of Composite Materials*, 41(1), 5-25.

- 32 Suwito, A., Ababneh, A., Xi, Y., and Willam, K. (2006) "The Coupling Effect of Drying Shrinkage and Moisture Diffusion in Concrete", *Computers & Concrete*, 3(2-3), 103-122.
- 33 Suwito, Cai, X.-C., and Xi, Y. (2006) "Parallel Finite Element Method for Coupled Chloride Penetration and Moisture Diffusion in Concrete", *International Journal of Numerical Analysis and Modeling*, 3(4), 481-503.
- 34 Xi, Y., Eskandari-Ghadi, M., Suwito, and Sture, S. (2006) "A Damage Theory Based on Composite Mechanics", *J. of Eng. Mech., ASCE*, 132(11), 1-10.
- 35 Li, Y., and Xi, Y. (2006) "Study on the Properties of Portland Cement Mortar and Concrete Containing Crumb Rubber Aggregate", *Concrete*, 200, 45-48 (in Chinese).
- 36 Li, Y., Jin, C., and Xi, Y. (2006) "The Properties of Sulfur Rubber Concrete (SRC)", *J. of Wuhan Univ. of Tech. (Mater. Sci. Ed.)*, 21(1), 129-133.
- 37 Chang, K.K., Roh, Y.S., and Xi, Y. (2006) "A Fractal Fracture Model and Application to Concrete with Different Aggregate Sizes and Loading Rates", *Structural Engineering and Mechanics*, 23(2), 147-161.
- 38 Li, Y., Lee, J.S., and Xi, Y. (2005) "Study on Sulfur Rubber Concrete", *J. of Building Materials*, 8(4), 368-372 (in Chinese).
- 39 Xi, Y. and Nakhi, A. (2005) "Composite Damage Models for Diffusivity of Distressed Materials", *J. of Materials in Civil Engineering, ASCE*, May/June, 17(3), 286-295.
- 40 Willam, K., Rhee, I., and Xi, Y. (2005) "Thermal Degradation in Heterogeneous

Concrete Materials”, *J. of Materials in Civil Engineering*, ASCE, May/June, 17(3), 276-285.

- 41 Asiz, A., Zhang, W., and Xi, Y. (2003) “Analysis of Aging of Piezoelectric Crystal Resonators”, *IEEE Transactions on Ultrasonic, Ferroelectric, and Frequency Control (IEEE-UFFC)*, 50(12), 1647- 1655.
- 42 Roh, Y.S., Asiz, A., Zhang, W.P., and Xi, Y. (2003) “Experimental Study and Theoretical Prediction of Aging Induced Frequency Shift of Crystal Resonators and Oscillators”, *Microelectronics Reliability*, 43(12), 1993-2000.
- 43 Xie, Z.H., Wen, X., and Xi, Y. (2003) “ASR Potentials of Glass Aggregates in Water-Glass Activated Fly Ash and Portland Cement Mortars”, *Journal of Materials in Civil Engineering*, ASCE, 15(1), 67-74.
- 44 Ababneh, A., Farid Benboudjema, and Xi, Y. (2003) “Chloride Penetration in Non-Saturated Concrete”, *J. of Materials in Civil Engineering*, ASCE, 15(2), 183-191.
- 45 Xie, Z.H., and Xi, Y. (2002) “Use of Recycled Glass as a Raw Material in the Manufacture of Portland Cement”, *Materials and Structures*, RILEM, Sept. – Oct., 510-515.
- 46 Ababneh, A., and Xi, Y. (2002) “An Experimental Study on the Effect of Chloride Penetration on Moisture Diffusion in concrete”, *Materials and Structures*, RILEM, 35(254), 659-664.
- 47 Kong, J., Ababneh, A., Frangopol, D.M., and Xi, Y. (2002) “Reliability Analysis of Chloride Penetration in Saturated Concrete ”, *Probabilistic Engineering Mechanics*, 17, 305-315.
- 48 Suwito, A., Jin, W., Xi, Y., and Meyer, C. (2002) "A Mathematical Model for the

Pessimum Effect of ASR in Concrete",
Concrete Science and Engineering,
RILEM, 4, 23-34.

- 49 Xie, Z., and Xi, Y. (2001) "Hardening Mechanisms of An Alkaline Activated Class-F Fly Ash", *Cement and Concrete Research*, 31, 1245-1249.
- 50 Amparano, F.E., Xi, Y., and Roh, Y.S. (2000) "Experimental Study on the Effect of Aggregate Content on Fracture Behavior of Concrete", *Engineering Fracture Mechanics*, 67, 65-84.
- 51 Xi, Y., Willam, K., and Frangopol, D. (2000) "Multiscale Modeling of Interactive Diffusion Processes of Concrete", *Journal of Engineering Mechanics*, ASCE, 126(3), 258-265.
- 52 Roh, Y.S., and Xi, Y. (2000) "A General Formulation for Transition Probabilities of Markov Model and the Application to Fracture of Composite Materials", *Probabilistic Engineering Mechanics*, 15(3), 241-250.
- 53 Meyer, C., and Xi, Y. (1999) "Use of Recycled Glass and Fly Ash for Precast Concrete", *Journal of Materials in Civil Engineering*, ASCE, May, 11(2), 89-90.
- 54 Xi, Y., and Bazant, Z.P. (1999) "Modeling Chloride Penetration in Saturated Concrete", *Journal of Materials in Civil Engineering*, ASCE, 11(1), 58-65.
- 55 Amparano, F.E., and Xi, Y. (1998) "Pumpability of Nonsand Concrete with Anti-Segregative Additives", *ACI Materials Journal*, 95(6), 695-703.
- 56 Tennis, P., Jennings, H.M., and Xi, Y. (1997) "Mathematical Modeling of Cement Paste Microstructure by Mosaic Pattern, Part II - Application to Cement Paste", *Journal of Materials Research*, 12(7), 1741-1749.

- 57 Xi, Y., and Bazant, Z.P. (1997) "Random Growth of Crack with R-curve: Markov Process Model", *Engineering Fracture Mechanics*, 57(6), 593-608.
- 58 Neubauer, C.M., Bergstrom, T.B., Sujata, K., Xi, Y., Garboczi, E.J., and Jennings, H.M. (1997) "Drying Shrinkage of Cement Paste as Measured in an ESEM and Comparison with Microstructural Models", *Journal of Materials Science*, 32, 6415-6427.
- 59 Xi, Y., and Jennings, H.M. (1997) "Shrinkage of Cement Paste and Concrete Modeled by a Multiscale Effective Homogeneous Theory", *Materials and Structures (RILEM)*, 30, July, 329-339.
- 60 Xi, Y. (1996) "Analysis of Internal Structures of Composite Materials by Second Order Property of Mosaic Patterns", *Materials Characterization*, Jan., 11-25.
- 61 Xi, Y. (1996) "Representative Volumes of Composite Materials", *Journal of Engineering Mechanics*, ASCE, 122(12), 1159-1167.
- 62 Xi, Y., Jennings, H.M., and Tennis, P. (1996) "Mathematical Modeling of Cement Paste Microstructure by Mosaic Pattern, Part I: Theory", *Journal of Materials Research*, 11(8), 1943-1952.
- 63 Bazant, Z.P., and Xi, Y. (1995) "Continuous Retardation Spectrum for Solidification Theory of Concrete Creep", *Journal of Engineering Mechanics*, ASCE , 121(2), 281-288.
- 64 Xi, Y. (1995) "A Model for Moisture Capacities of Composite Materials - Formulation", *Computational Materials Science*, 4, 65-77.
- 65 Xi, Y. (1995) "A Model for Moisture Capacities of Composite Materials -

Application to Concrete", *Computational Materials Science*, 4, 78-92.

- 66 Xi, Y., Bazant, Z.P., and Jennings, H.M. (1994) "Moisture Diffusion in Cementitious Materials: Adsorption Isotherm", *Journal of Advanced Cement-Based Materials*, 1, 248-257.
- 67 Xi, Y., Bazant, Z.P., and Jennings, H.M. (1994) "Moisture Diffusion in Cementitious Materials: Moisture Capacity and Diffusivity", *Journal of Advanced Cement-Based Materials*, 1, 258-266.
- 68 Bazant, Z.P., and Xi, Y. (1994) "Drying Creep of Concrete: Constitutive Model and New Experiments Separating its Mechanisms", *Materials and Structures (RILEM)*, 27, 3-14.
- 69 Xi, Y., Bergstrom, T.B., and Jennings, H.M. (1994) "Image Intensity Matching Technique: Application to the Environmental Scanning Electron Microscope", *Computational Materials Science*, 2, 249-260.
- 70 Bazant, Z.P., Xi, Y., and Baweja, S. (1993) "Improved Prediction Model for Time Dependent Deformation of Concrete, Part VII: Short Form of BP-KX Model, Statistics and Extrapolation of Short-Time Data", *Materials and Construction, (RILEM)*, 26, 567-574.
- 71 Bazant, Z.P., and Xi, Y. (1993) "Stochastic Drying and Creep Effects in Concrete Structures", *Journal of Structural Engineering, ASCE*, 119(1), 301-322.
- 72 Bazant, Z.P., Panula, L., Kim, J.K., and Xi, Y. (1992) "Improved Prediction Model for Time-Dependent Deformation of Concrete, Part VI: Simplified Code-Type Formulation", *Materials and Construction, (RILEM)*, 25, 219-223.

- 73 Bazant, Z.P., Xi, Y., and Reid, S.G. (1991) "Statistical Size Effect in Quasibrittle Structures: I. Is Weibull Theory Applicable ?", *Journal of Engineering Mechanics*, ASCE, 117(11), 2609-2622.
- 74 Bazant, Z.P., and Xi, Y. (1991) "Statistical Size Effect in Quasibrittle Structures: II. Nonlocal Theory", *Journal of Engineering Mechanics*, ASCE, 117(11), 2623-2640.
- 75 Xi, Y., and Bazant, Z.P. (1989) "Sampling Analysis of Concrete Structures for Creep and Shrinkage with Correlated Random Material Parameters", *Probabilistic Engineering Mechanics*, 4(4), 174-186.

Journal Articles under Review

- 1 Yin, S.P., Na, M.W., and Xi, Y. (2016) "Experimental Research on Flexural Behavior of RC Beams Strengthened with Textile Reinforced Concrete under Chloride Corrosion", *International Journal of Concrete Structures and Materials*, 6/27/2016.
- 2 Isteita, M.H., and Xi, Y. (2016) "The Effect of Thermal Conduction on Chloride Penetration in Concrete", *ACI Materials Journal*, 8/21/2016.
- 3 Xia, J., Xi, Y., and Jin, W. (2016) "Temperature Dependent Coefficient of Thermal Expansion of Concrete in Freezing Process", *Journal of Engineering Mechanics*, ASCE, 8/12/2016.
- 4 Jin, Y., and Xi, Y. (2016) "Theoretical Modeling of the Effects of Neutron Irradiation on Properties of Concrete", *Journal of Engineering Mechanics*, ASCE, 8/24/2016.
- 5 Zhang, W.P., Tong, F., Gu, X., and Xi, Y. (2016) "Study on Moisture Transport of

Axial Compression Damaged Cementitious Materials in Atmospheric Environment”, *Journal of Materials for Civil Engineering*, ASCE, 9/6/2016.

Book and Book Chapter

- 1 Li, Z.J., Leung, C., and Xi, Y. (2009) Structural Renovation in Concrete, Taylor & Francis, London, 356p.
- 2 Willam, K., Xi, Y., and Naus, D. (2013) “Concrete under High Temperature”, Chapter 26 of *Infrastructure systems for Nuclear Energy*, Editors: Thomas T. C. Hsu, Jui-Liang Lin, and Chiun-lin Wu, Publisher: Wiley.

Refereed Conference Papers

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- 2 Xi, Y., and Willam, K., (2012) "Nuclear Radiation Effects on Properties of Concrete", Proc. of 2012 Joint Conference of the Engineering Mechanics Institute and the 11th ASCE Joint Specialty Conference on Probabilistic Mechanics and Structural Reliability June 17-20 2012, Notre Dame, IN.
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"A Review of the Effects of Radiation on Microstructure and Properties of Concrete Used in Nuclear Power Plants", NUREG/CR-7171, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, and ORNL/TM-2013/263, 131p.
- 2 Damrongwiriyanupap, N., Liang, Y.C., and Xi, Y. (2012) Application of Roller Compacted Concrete (RCC) in Colorado's Roadways, Colorado DOT Report No. CDOT-2012-11, 60p.
- 3 Xi, Y., Meshgin, P., Na, O., and Li, Y. (2010) "Premixed Rubberized Insulation Mortar", A Technical Report to CDPHE,

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- 8 Basche, H.D., Willam, K., and Xi, Y. (2005) "Uncoupled Transient Thermo-Elastic Stress Analysis", Internal Report CU/SESM-2005/002, University of Colorado at Boulder.
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Environment Climates”, Colorado DOT Report No. CDOT -DTD-R-2003-4, 107p.

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- 22 Xi, Y., Shing, B., and Xie, Z.H. (2001) “Development of Optimal Concrete Mix Designs for Bridge Decks”, Colorado DOT Report No. CDOT-DTD-R-2001-11, 60p.

Awards and Recognitions

2010 *Kwang-Hua Chair Professor* at Tongji University, China.

Recipient of *2010 Faculty Fellowship* at University of Colorado at Boulder.

Research development award 2004.
Department of Civil, Environmental and Architectural Engineering, University of Colorado at Boulder.

Young Researcher’s award for academic year 1998-1999. Department of Civil, Environmental and Architectural Engineering, University of Colorado at Boulder.

Faculty advisor for Drexel teams in American Concrete Institute (ACI) beam

competition. In 1993, **First prize** for the highest ultimate load was awarded to the Drexel team. In 1994, **First prize** for the highest ultimate load was awarded to one of the Drexel teams. **First prize** for the best prediction was awarded to another Drexel team.

Professional Activities

Committee chairs and directors

- The administrator of Colorado Local Technical Assistance Program (sponsored by the U.S. Federal Highway Administration, Colorado Department of Transportation, and University of Colorado at Boulder)
- The vice chair of Experimental Analysis and Instrumentation (EA&I) Committee, ASCE Engineering Mechanics Institute (EMI) (2012).
- The chair of Experimental Analysis and Instrumentation (EA&I) Committee, ASCE Engineering Mechanics Institute (EMI) (2013-2014).
- The past chair of Experimental Analysis and Instrumentation (EA&I) Committee, ASCE Engineering Mechanics Institute (EMI) (2015).
- The chair of the committee on Properties of Materials, ASCE Engineering Mechanics Institute (EMI), 2003-2007.

Services at University of Colorado at Boulder

- A member of First Level Review Committee of College of Engineering (2012 – 2015).
- The executive committee member of Dept. of Civil, Environmental, and Architectural Engineering representing Structural Engineering and Structural Mechanics (SESM) Group (2005 – 2011).
- The coordinator of Structural Engineering and Structural Mechanics Group in 2002 and 2003.

- A member of the Curriculum Committee of CEAE in 1999 and 2000.
- A member of the Facility Committee of CEAE in 2001-2003, and 2011.
- The seminar organizer of Structural Engineering and Structural Mechanics Group in 1999 and 2000.
- A member of the search committee for the Structural Engineering and Structural Mechanics Group, 2008, 2009, 2011, 2012, 2013.

Associate editor, guest editor and editorial board member of journals

- A member of Editorial Board of international journal *Computers & Concrete*.
- A member of Editorial Advisory Board of international journal *Magazine of Concrete Research*.
- An member of Editorial Board of the Madridge Journal of Nanotechnology & Nanoscience (MJNN).
- A member of Editorial Advisory Board of *Journal of Building Structures* (in Chinese).
- An associate editor and a member of Editorial Board of *Journal of Sustainable Cement Based Materials*.
- An associate editor and a member of Editorial Board of *Journal of Engineering Mechanics*, ASCE, 2003-2007.
- A member of International Scientific Committee of FraMCoS.
- A member of Advisory Board for International Association on Concrete Creep (IA-Concreep).
- A member of Editorial Advisory Committee of an international journal “*Concrete Science and Engineering*” (RILEM, the journal was discontinued).
- A member of the Internal Oversight Board for the NSF NEES center at CU (up to 2009).
- An editor for the special issue of *Journal of Materials for Civil Engineering* (ASCE), dedicated to Model-Based

Simulation on Durability of Materials and Structures (2005).

- An editor for the special issue of Journal of Engineering Mechanics (ASCE), dedicated to durability mechanics (March 2000).
- An editor for the special issue of Journal of *Concrete Science and Engineering* (RILEM), dedicated to durability mechanics (March 2002).
- An editor of the proceedings of 8th Faculty Enhancement Workshop of ACBM, July 15-18, 2001, Boulder, Colorado.

International Conferences and Workshops organized

- A member of International Scientific Committee of 10th International Symposium on Innovation & Utilization of High-Performance Concrete, Sept. 16-18, 2014, Beijing, China.
- A member of International Scientific Committee of the 5th BIOT Conference on Poromechanics (BIOT-5), July 10-12, 2013, Vienna, Austria.
- A member of scientific committee for The 8th International Symposium on Cement & Concrete (ISCC2013), Nanjing, China.
- A member of International Advisory Committee Member of 2011 World Congress on Advances in Structural Engineering and Mechanics, Seoul, Korea, Sept. 2011.
- A member of International Scientific Committee of FraMCoS-7, Korea, 2010.
- A Scientific Committee Members of Computational Technologies in Concrete Structures, held in Korea in 2009.
- A Scientific Committee Members of 8th International Conference on Creep, Shrinkage and Durability of Concrete and Concrete Structures, held in Sept. 2008 in Japan.
- A local organizer of FraMCoS-5 (The 5th Int. Conf. on Fracture Mechanics of

- Concrete and Structures), April 12-15, 2004, Vail, Colorado.
- An organizer of NSF Workshop on Interface Problems in Cement-Based Materials, April 12-15, 2004, Vail, Colorado.
 - An organizer of FHWA and CDOT Symposium on Innovative Bridge Materials and Construction, April 22-23, 2004, Denver, Colorado.
 - The organizer and a co-chair of the NSF Workshop on Model-Based Simulation of Durability of Materials and Structures, July 4-7, 2002, Prague.
 - A co-chair of the ASTM Symposium of Electrochemical Techniques to Determine Corrosion-Related Properties of Concrete and of Metals in Concrete, Committees G01 (G01.14), C09 (C09.66), June 18, 2003, Denver, Colorado.
 - The local organizer of 8th Faculty Enhancement Workshop of ACBM, July 15-18, 2001, Boulder, Colorado.
 - A member of the International Scientific Committee of CONCREEP-6, 2001, MIT, Boston.
 - A member of the International Scientific Committee of CONCREEP-7, 2005, Nantes, France.

Member of NSF review panel, professional committees and organizations

- A NSF review panelist for career proposals, Spet. 2003; SBIR proposals, March 2004; career proposals, Sept. 2004; BRIGE proposals, June 2013.
- A member of the committee on poromechanics, ASCE/Engineering Mechanics Division.
- A member of the committee on experimental analysis and instrumentation, ASCE/Engineering Mechanics Division.
- A member of the committee 446 (Fracture Mechanics), American Concrete Institute.
- A member of the committee TC107 (Creep and Shrinkage), International

Union of Testing and Research
Laboratories for Materials and
Structures.

- A member of the committee TC QFS
(Size effect of quasibrittle fracture),
International Union of Testing and
Research Laboratories for Materials and
Structures.

Principal Dissertation/Thesis Advisor for Graduate Students

Graduate students obtained academic and research positions after graduation (11)

A.N. Ababneh, Assistant Professor, Clarkson
University, Potsdam, NY.

A. Asiz, Assistant professor, University of
New Brunswick, Canada.

J. Richards, Lecturer (Captain), United States
Military Academy, West Point, NY.

A. Nakhi, Assistant Professor, Kuwait
University, Safat, Kuwait.

M. Ghadi, Assistant Professor, University of
Science and Tchnology of Mazandaran, Iran.

Y.S. Roh, Associate Professor, Dankook
University, South Korea.

Suwito, Researcher, King Saudi University,
Saudi Arabia.

Jaesung Lee, Assistant professor, Hannam
University, South Korea.

Nattapong Damrongwiriyanupap, Assistant
Professor, University of Phayao, Thailand.

Pania Meshgin, Sandia National Laboratory,
U.S.A.

Okpin Na, Senior Research Engineer,
Hyundai Engineering & Construction Co.,
Ltd., South Korea

Ph.D. Students

1. A. Samadi (1996, Drexel Univ.)
2. Clark, Daniel (1997, Drexel Univ.,
transferred to another school)
3. Y.S. Roh (2000)
4. A.N. Ababneh (2002)
5. A. Asiz (2002)
6. A. Nakhi (2003)
7. M. Gahdi (2004, S. Stein co-advisor)
8. A. Suwito (2005)

9. S.Y. Chang (2005, transferred to another school)
10. J.S. Lee (2006)
11. E. Ou (2007, R. Corotis co-advisor)
12. Nattapong Damrongwiriyanupap (2010)
13. Pania Mashgin (2011)
14. Okpin Na (2011)
15. Yu-Chang Liang (2012)
16. Wemphy Hanafi (2012, transferred to another school)
17. Hesham Abdulla (2014, transferred to another school)
18. Musiket Kamtornkiat (2014, F. Vernerey co-advisor)
19. Ali Harajli (2016, D.M. Frangopol co-advisor)
20. Fatimah Ali (current)
21. Yuxiang Jing (current)
22. Yao Wang (current)
23. Linfei Li (current)
24. Mohamed Abdelrahman (current)
25. Mohammed Zainy (current)
26. Jiang Zhilv (visiting Ph.D. student 2014-2016)

M.S. Students (M.S. Thesis or M.S. Report)

1. F.E. Amparano (1995 at Drexel Univ.)
2. W. Xiang (1998 at Drexel Univ.)
3. A. Hakhi (1998)
4. W. Graziano (1999)
5. J.H. Kim (1999)
6. J.H. Shin (2000)
7. B. Black (2001)
8. Y.J. Cho (2002)
9. J.S. Lee (2002)
10. K. Chanvut (2002)
11. M.P. Blangy (2002)
12. Z.H. Xie (2002)
13. R. Cusson (2002)
14. K. Streeter (2002)
15. S. Holst (2003)
16. J. Richards (2004)
17. S.R. Deshpande (2004)
18. Bret Banwart (2004)
19. R. Sheehan (2005)
20. Lydia Abarr (2005)
21. J. Walbert (2005)
22. D. Doherty (2005)
23. Scott Hamel (2005)

24. P. Orendorff (2005)
25. Adnan Muzaffar (2006)
26. M. Yamakawa (2008)
27. Haideh Shams Hakimi (2008)
28. Dustin Virgilio (2009)
29. Moad H. Isteita (2009)
30. John Calvert (2010)
31. Hesham S.R. Abdulla (2010)
32. Brandon Parker (2011)
33. Andrew Geister (2011)
34. Courtney Shepard (2011)
35. Jack Thorpe (2012)
36. Johan Bjorkquist (2012)
37. Lee Maggert (2012)
38. Wayne Brown (2012)
39. Xingang Wang (2013)
40. Brandon Buder (2013)
41. Mitchell Rosendahl (2013)
42. Tate Fairbanks (2013)
43. Benjamin Gallaher (2013)
44. Yao Wang (2014)
45. Linfei Li (2014)
46. William Lam (2014)
48. Mohammed Zainy (2015)
49. Shan Wo (current)
50. Zach Banachowski (2016, and to be completed)
51. Tushar Jain (current)

Host sabbatical leave professors

Z.J. Li (2002); L. Bennethum (2003-2004); A. Ababneh (2010); Sungjin Jung (2010); Seunghun Kim (2011); Inkyu Rhee (2012); Youngsook Roh (2012); Jiří Němeček (Fulbright Scholar 2013); Jaesung Lee (2014); and Bangsub Lee (2014).

Host exchange scholars

J.N. Liu (Visiting scholar 1996); F. Alleau (Exchange student 1997); F. Benboudjema (Exchange student 1997); F. Cherqui (Exchange student 1999); C. Gavard (Exchange student 1999); Aurelie Jean (Exchange student 2004); Stephane Milhaud (Exchange student 2005); Thomas DeLarrard (Exchange student 2005); and Ludovic Missemer (Exchange student 2006); Deborah Sperling (NSF/REU, 2005); Augustin

Parret-Freaud (Exchange student 2006);
Chao Su (Visiting scholar 2007-2008);
Adrien Hilaire (Exchange student 2009);
Zhengmao Ye (Visiting scholar 2009); Fei Li
(Visiting scholar 2011); Yu Bai (Visiting
scholar 2011); Guohua Li (Visiting scholar
2011); Jin Xia (postdoc 2012); Helene
Penvern (visiting scholar 2012); Wunchock
Kroehong (visiting scholar 2012); Zhuge Yan
(visiting professor 2012); Fu Jun (visiting
professor 2012); Li Jizhen (visiting professor
2013); Xu Jinxia (visiting professor 2013);
Xu Peizhen (visiting professor 2013); Decret
Damien (visiting student 2015); Thomas
Langlade (visiting student 2015); Shiping
Yin (visiting professor 2015); Yaguang Zhu
(visiting professor 2015); and Chunxia Xue
(visiting professor 2016).

Research associates and professional research assistants supervised

Z.H. Xie (1999); A. Asiz (2003); Y. Li (2003,
2010); A. Ababneh (2003, 2010); Suwito
(2005); J.S. Lee (2006); W.P. Zhang (2006);
Kent Polkinghorne (2012 to 2013); Renee
Railsback (2002 to present); Lindsay
Marshall (2004 to 2013); Cassandra Guild
(2013 to 2015); and Sarah Wilson
(2015-present).