

Yaghoob (Amir) Farnam, PhD

Curriculum Vitae

Assistant Professor, Drexel University

Department of Civil, Architectural & Environmental Engineering

Department of Materials Science & Engineering, Affiliated Faculty Member

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OVERVIEW

Dr. Farnam is an assistant professor at Drexel University where he performs fundamental and applied research on (1) development of advanced, novel, and sustainable materials for civil infrastructure through fundamental multiscale understanding of the property-structure-performance relation between chemical compositions and physical properties of materials, and (2) enhancement of the durability and resilience of civil infrastructure exposed to environmental stimuli (e.g., thermal, mechanical, and/or chemical distresses) through advanced understanding of damage mechanisms. In conjunction with his position at Drexel, Dr. Farnam is co-founder and the senior technical advisor in SusMaX LLC (Sustainable Materials Exploration), a Drexel University Spin-out Company supported by the Drexel Applied Innovation Office and National Science Foundation (NSF), where he attempts to transfer technology and research developed in his lab to industry to address challenges that we face in our society. Dr. Farnam has over ten years of experience working on various areas of infrastructure materials including durability of concrete exposed to deicing and chloride-based salts, development of thermal-responsive concrete using phase change materials, multifunctional bioinspired construction materials, microbial self-healing concrete, lightweight aggregate from waste glass and coal combustion ash, and advanced manufacturing of construction materials. He has been involved in several projects related to enhancing the performance of infrastructure materials sponsored by NSF, Department of Education (DoE), Pennsylvania Department of Community and Economic Development, Pennsylvania Department of Transportation (PennDOT), United Soybean Board, Compass Minerals Inc., Drexel University, and Portland Cement Association (PCA). He is a voting, associate and active member of American Concrete Institute (ACI) and Transportation Research Board (TRB). His professional membership includes ACI, ACerS, AEWG, TRB, ASCE, ASEE, and ASTM organizations.

EDUCATIONS

2012-2015	PhD in Civil/Materials Engineering	Purdue University	W. Lafayette, IN
2005-2007	MSc in Civil Engineering	University of Tehran	Tehran, Iran
2001-2005	BSc in Civil Engineering	K.N.T. Uni. of Technology	Tehran, Iran

APPOINTMENTS

- Assistant Professor, Department of Civil, Architectural and Environmental Engineering Department, Drexel University, Philadelphia, PA	09/2016 – present
- Affiliated Faculty Member, Department of Materials Science and Engineering, Drexel University, Philadelphia, PA	04/2018 – present
- Co-Founder and Senior Technical Advisor, SusMaX LLC, Philadelphia, PA	08/2020 – present
- Visiting Investigator, Louisiana Transportation Research Center, Louisiana Department of Transportation and Development, LSU, Baton Rouge, LA	Summer 2018
- Postdoctoral Fellow, Purdue University, West Lafayette, IN	09/2015 – 07/2016
- Visiting Instructor, Purdue University, West Lafayette, IN	09/2015 – 12/2015
- Research/Teaching Assistant, West Lafayette, Purdue University, IN	09/2012 – 08/2015
- Research Scholar, University of Sherbrooke, Sherbrooke, CANADA	09/2010 – 08/2012
- Technical/Project Manager, Construction Materials Institute, University of Tehran, Tehran, IRAN	02/2008 – 08/2010

AWARDS AND HONORS

- Outstanding Early-Career Award from the Drexel College of Engineering	2021
- Best Paper Award from the Journal of the American Ceramic Society	2020
- Third Place Poster Award in the Fall 2020 ACI Virtual Convention	2020
- Drexel University Faculty Summer Research Award	2018
- Drexel University Coop Office of the Provost Research Award	2017
- Purdue University College of Engineering Outstanding Research Award	2015
- Purdue University Civil Engineering Graduate Research Award	2015
- Portland Cement Association Education Foundation's J. P. Gleason Fellowship	2014
- Purdue University William L. Dolch Award	2014
- Quebec MELS Merit Research Fellowship (FQRNT)	2012
- University of Sherbrooke Institutional Scholarship	2011
- University of Sherbrooke Institutional Scholarship	2010
- University of Tehran Best Master's Thesis Award	2008
- American Concrete Institute (ACI) Bowling Ball Student Competition 2 nd Place Award	2004
- Honors from the Iranian Minister of Science, Research and Technology	2004
- Honors from the President of K.N. Toosi University of Technology	2004
- American Concrete Institute (ACI) Concrete Cube Student Competition 1 st Place Award	2003

PUBLICATIONS

Scholarly Metrics:	Citations	h-index
Google Scholar:	1643	25
Scopus:	1028	20
Web of Science:	887	20

(i) Peer-Reviewed Journal Papers:

Since Joining Drexel University:

Under Review:

- J1. R. Deb, A.W. Mutua, J. He, and **Y. Farnam** (Under Internal Review), Effects of Thermal Cycling Rate and Pore Confinement on Thermal Behavior of different Incorporation Methods of Phase Change Materials in Concrete for Deicing and Low-Temperature Applications.
- J2. M. Balapour M., M. Houshmand Khaneghahi, E.J. Garboczi, G.Y. Hsuan, D.E. Hun, and **Y. Farnam** (Under Internal Review) "Off-spec fly ash based lightweight aggregate properties and its influence on the fresh, mechanical, and hydration properties of lightweight concrete; A comparative study".
- J3. J. He, M. Balapour, and **Y. Farnam** (Under Internal Review), Soy Methyl Ester-Polystyrene (SME-PS) Performance as a Concrete Sealant: A Comparative Literature Review.
- J4. M. Houshmand Khaneghahi, J. He, and **Y. Farnam** (Under Internal Review), Investigation on Physical and Chemical Protecting Mechanism of Soy Methyl Ester- Polystyrene (SME-PS) as a Concrete Surface Protectant.
- J5. P. Namakiaraghi, L. McNally, R. Spragg, and **Y. Farnam** (Under Internal Review), Studying the Effect of Bio-inspired Printing Patterns and Process Parameters on Tensile Behavior of 3D-printed Polymeric Elements.
- J6. F. Althoey, M. Balapour and **Y. Farnam** (Under Internal Review), An Insight into the Role of Supplementary Cementitious Materials in Mitigating Damage due to Formation of Sulfate-based Chemical Phase Change in Concrete Exposed to NaCl.

Submitted:

- J7. M. Balapour, T. Thway, N. Moser, E.J. Garboczi, G.Y. Hsuan, and **Y. Farnam** (Submitted) “Engineering properties and pore structure of lightweight aggregates produced from off-spec fly ash”. Submitted to the Journal of the American Ceramic Society.
- J8. M. Balapour, T. Thway, R. Rao, N. Moser, E.J. Garboczi, Y.G. Hsuan, and **Y. Farnam** (Submitted), A thermodynamics-guided framework to design lightweight aggregate from waste coal combustion fly ash, Submitted to the Journal of Resources, Conservation & Recycling, Elsevier.
- J9. J. He, T. Thway, and **Y. Farnam** (Submitted), Effectiveness of Soy Methyl Ester-Polystyrene as a Concrete Protectant on Mitigating the Chemical Interaction between Cement Paste and Calcium Chloride, Submitted to Transportation Research Record: Journal of the Transportation Research Board.

In 2021:

- J10. M. Balapour, A.W. Muata, and **Y. Farnam** (2021), Evaluating the thermal efficiency of microencapsulated phase change materials for thermal energy storage in cementitious composites, Cement and Concrete Composite Journal, Elsevier, Volume 116, Article No. 103891, pp. 1-14, doi: 10.1016/j.cemconcomp.2020.103891.
- J11. F. Althoey, P. Stutzman, M. Steiger, and **Y. Farnam** (2021), Thermo-Chemo-Mechanical Understanding of Damage Development in Porous Cementitious Materials Exposed to Sodium Chloride Under Thermal Cycling, Cement and Concrete Research, Elsevier, Volume 147, Article No. 106497, pp. 1-13, doi: 10.1016/j.cemconres.2021.106497.
- J12. M. Balapour, R. Rao, E.J. Garboczi, S. Spatari, Y.G. Hsuan, and **Y. Farnam** (2021), Thermochemical principles of the production of lightweight aggregates from waste coal bottom ash, Journal of the American Ceramic Society, Volume 104 (1), pp. 613–634, doi: 10.1111/jace.17458.

In 2020:

- J13. A.W. Mutua, M. Balapour, and **Y. Farnam** (2020), Towards development of nature-inspired thermo-responsive vascular composites: Analysis of polymeric composites, Construction and Building Materials Journal, Elsevier, Volume 259, pp. 1-12, doi: 10.1016/j.conbuildmat.2020.120407.
- J14. F. Althoey, and **Y. Farnam** (2020), Performance of Calcium Aluminate Cementitious Materials in the Presence of Sodium Chloride, ASCE Journal of Materials in Civil Engineering, ASCE, Vol. 32, Issue 10, pp. 1-10, doi: 10.1061/(ASCE)MT.1943-5533.0003365.
- J15. M. Balapour, W. Zhao, E.J. Garboczi, N.Y. Oo, S. Spatari, G. Hsuan, P. Billen, and **Y. Farnam** (2020), Potential Use of Lightweight Aggregate (LWA) Produced from Bottom Coal Ash for Internal Curing of Concrete Systems, Cement and Concrete Composite, Elsevier, Volume 105, pp. 1-12, doi: 10.1016/j.cemconcomp.2019.103428.

In 2019:

- J16. F. Althoey and **Y. Farnam** (2019), The effect of using supplementary cementitious materials on damage development due to the formation of a chemical phase change in cementitious materials exposed to sodium chloride, Construction and Building Materials Journal, Elsevier, Volume 210, pp. 685-695, doi: 10.1016/j.conbuildmat.2019.03.230.
- J17. M. Ksara, R. Newkirk, S.K. Langroodi, F. Althoey, C. Sales, C. Schauer, and **Y. Farnam** (2019) Microbial Damage Mitigation Strategy in Cementitious Materials Exposed to Calcium Chloride Deicing Salts, Construction and Building Materials Journal, Elsevier, Volume 195, pp. 1-9, doi: 10.1016/j.conbuildmat.2018.10.033.

In 2018:

- J18. Y. Shields, E. Garboczi, J. Weiss, and **Y. Farnam** (2018), Freeze-Thaw Crack Determination in Cementitious Materials Using 3D X-ray Computed Tomography and Acoustic Emission, *Cement and Concrete Composite Journal*, Elsevier, Volume 89, pp. 120–129, doi: 10.1016/j.cemconcomp.2018.03.004.
- J19. F. Althoey, B. Wisner, A. Kontsos, and **Y. Farnam** (2018), Cementitious Materials Exposed to High Concentration of Sodium Chloride Solution: Formation of A Deleterious Chemical Phase Change, *Construction and Building Materials Journal*, Elsevier, Volume 167, pp. 543–552, doi: 10.1016/j.conbuildmat.2018.02.066.
- J20. L. Nguyen, A.J. Moseson, **Y. Farnam**, and S. Spatari, (2018), Effects of Composition and Transportation Logistics on Environmental, Energy and Cost Metrics for the Production of Alternative Cementitious Binders, *Journal of Cleaner Production*, Elsevier, Volume 185, 1, pp. 628–645, doi: 10.1016/j.jclepro.2018.02.247.
- J21. P. Billen, M. Mazzotti, L. Pandelaers, N. Oo, W. Zhao, Z. Liu, J. Redus, I. Diaz, I. Bartoli, **Y. Farnam**, S. Spatari, Y. Hsuan (2018), Melt ceramics from coal ash: constitutive product design using thermal and flow properties, *Resources, Conservation & Recycling Journal*, Elsevier, Volume 132, pp. 168–177, doi: 10.1016/j.resconrec.2018.01.035.
- J22. H.S. Esmaeeli, **Y. Farnam**, J.E. Haddock, P.D. Zavattieri, J. Weiss (2018), Numerical Analysis of the Freeze-Thaw Performance of Cementitious Composites that Contain Phase Change Material (PCM), *Materials and Design Journal*, Elsevier, Volume 145, pp. 74–87, doi: 10.1016/j.matdes.2018.02.056.

In 2017:

- J23. **Y. Farnam**, H.S. Esmaeeli, P.D. Zavattieri, J. Haddock, J. Weiss (2017), Incorporating phase change materials in concrete pavement to melt snow and ice, *Cement and Concrete Composite*, Elsevier, 84, pp. 134–145, doi:10.1016/j.cemconcomp.2017.09.002.
- J24. **Y. Farnam**, B. Zhang, and J. Weiss (2017), Evaluating the Use of Supplementary Cementitious Materials to Mitigate Damage in Cementitious Materials Exposed to Calcium Chloride Deicing Salt, *Cement and Concrete Composite Journal*, Elsevier, doi: 10.1016/j.cemconcomp.2017.05.003.
- J25. P. Suraneni, J. Monical, E. Unal, **Y. Farnam**, and J. Weiss (2017), Calcium Oxychloride Formation Potential in Cementitious Pastes Exposed to Blends of Deicing Salt, *ACI Materials Journal*, American Concrete Institute, doi: 10.14359/51689607.
- J26. H.S. Esmaeeli, **Y. Farnam**, D. Bentz, P.D. Zavattieri, and J. Weiss (2017), Numerical Simulation of the Freeze-Thaw Behavior of Mortar Containing Deicing Salt Solution, *Journal of Materials and Structures*, Springer, Volume 50 (96), pp. 1–20, doi: 10.1617/s11527-016-0964-8.

In Sep-Dec 2016:

- J27. R. Ghantous, **Y. Farnam**, E. Unal, and J. Weiss (2016), The Influence of Carbonation on the Formation of Calcium Oxychloride, *Journal of Cement and Concrete Composite*, Elsevier, Volume 73, pp. 185–191, doi: 10.1016/j.cemconcomp.2016.07.016.
- J28. J. Monical, E. Unal, T. Barrett, **Y. Farnam**, and W. Weiss (2016), Reducing Joint Damage in Concrete Pavements, Quantifying Calcium Oxychloride Formation, *Journal of Transportation Research Record*, TRB, Volume 2577, doi: 10.3141/2577-03.

Before Joining Drexel University:

- J29. **Y. Farnam**, C. Villani, T. Washington, M. Spence, J. Jain, and J. Weiss (2016), Performance of Carbonated Calcium Silicate based Cement Pastes and Mortars Exposed to NaCl and MgCl₂ Deicing Salt, *Journal of Construction and Building Materials*, Elsevier, Vol. 111, pp. 63–71, doi: 10.1016/j.conbuildmat.2016.02.098.

- J30. J. Monical, C. Villani, **Y. Farnam**, E. Unal, and W. Weiss (2016), Using Low-Temperature Differential Scanning Calorimetry to Quantify Calcium Oxychloride Formation for Cementitious Materials in the Presence of CaCl₂, *Journal of Advances in Civil Engineering Materials*, ASTM, Vol. 5, No. 1, pp. 1–15, doi: 10.1520/ACEM20150024.
- J31. L. Liston, **Y. Farnam**, M. Krafcik, J. Weiss, K. Erk, and B. Y. Tao (2016), Binary Mixtures of Fatty Acid Methyl Esters as Phase Change Materials for Low Temperature Applications, *Journal of Applied Thermal Engineering*, Elsevier, Vol. 96, pp. 501-507, doi: 10.1016/j.applthermaleng.2015.11.007.
- J32. **Y. Farnam**, M. Krafcik, L. Liston, T. Washington, K. Erk, B. Tao, and J. Weiss (2016), Evaluating the Use of Phase Change Materials in Concrete Pavement to Melt Ice and Snow, *Journal of Materials in Civil Engineering*, ASCE, 28(4), pp. 1-10, doi: 10.1061/(ASCE)MT.1943-5533.0001439.
- J33. **Y. Farnam**, S. Dick, A. Wiese, J. Davis, D. Bentz, and J. Weiss (2015), The Influence of Calcium Chloride Deicing Salt on Phase Changes and Damage Development in Cementitious Materials, *Journal of Cement and Concrete Composite*, Elsevier, Vol. 64, pp. 1-15, doi: 10.1016/j.cemconcomp.2015.09.006.
- J34. C. Villani, **Y. Farnam**, T. Washington, J. Jain, and J. Weiss (2015), Conventional Portland Cement and Carbonated Calcium Silicate–Based Cement Systems: Performance During Freezing and Thawing in Presence of Calcium Chloride Deicing Salts, *Transportation Research Record: Journal of the Transportation Research Board*, No. 2508, pp. 48-54. doi: 10.3141/2508-06.
- J35. **Y. Farnam**, M.R. Geiker, D. Bentz, and J. Weiss (2015), Acoustic Emission Waveform Characterization of Crack Origin and Mode in Fractured and Alkali-Silica Reaction (ASR) Damaged Concrete, *Journal of Cement and Concrete Composite*, Elsevier, Vol. 59, pp. 135-145, doi:10.1016/j.cemconcomp.2015.04.008.
- J36. **Y. Farnam**, H. Todak, R. Spragg, and J. Weiss (2015), Electrical Response of Mortar with Different Degrees of Saturation and Deicing Salt Solutions during Freezing and Thawing, *Journal of Cement and Concrete Composite*, Elsevier, Vol. 59, pp. 49-59, doi:10.1016/j.cemconcomp.2015.03.003.
- J37. **Y. Farnam**, A. Wiese, D. Bentz, J. Davis, and J. Weiss (2015), Damage Development in Cementitious Materials Exposed to Magnesium Chloride Deicing Salt, *Journal of Construction and Building Materials*, Elsevier, Vol. 93, pp. 384-392, doi: 10.1016/j.conbuildmat.2015.06.004.
- J38. **Y. Farnam**, T. Washington, and J. Weiss (2015), The Influence of Calcium Chloride Salt Solution on the Transport Properties of Cementitious Materials, *Journal of Advances in Civil Engineering*, Hindawi, Vol. 2015, pp. 1-13, doi: 10.1155/2015/929864.
- J39. **Y. Farnam**, D. Bentz, A. Sakulich, D. Flynn, and J. Weiss (2014), Measuring Freeze and Thaw Damage in Mortars Containing Deicing Salt Using a Low-Temperature Longitudinal Guarded Comparative Calorimeter and Acoustic Emission, *Journal of Advances in Civil Engineering Materials*, ASTM, Vol. 3, No. 1, 2014, pp. 316–337, doi:10.1520/ACEM20130095.
- J40. **Y. Farnam**, D. Bentz, A. Hampton, and J. Weiss (2014), Acoustic Emission and Low-Temperature Calorimetry Study of Freeze and Thaw Behavior in Cementitious Materials Exposed to Sodium Chloride Salt, *Transportation Research Record: Journal of the Transportation Research Board*, No. 2441, pp. 81-90, doi: 10.3141/2441-11.
- J41. H. Gandomi, S.K. Babanajad, A.H. Alavi, and **Y. Farnam** (2012), A Novel Approach to Strength Modeling of Concrete under Triaxial Compression, *Journal of Materials in Civil Engineering*, ASCE, 2012, Vol. 24, No. 9, pp. 1132-1143, doi: 10.1061/(ASCE)MT.1943-5533.0000494.
- J42. S.K. Babanejad, **Y. Farnam**, and M. Shekarchi (2012), Failure Criteria and Triaxial Behavior of HPFRC Containing High Reactivity Metakaolin and Silica Fume, *Journal of Construction and Building Materials*, Elsevier, Vol. 29, pp. 215-229, doi:10.1016/j.conbuildmat.2011.08.094.
- J43. **Y. Farnam**, M. Moosavi, M. Shekarchi, S.K. Babanajad, and A. Bagherzadeh (2010), Behavior of Slurry Infiltrated Fiber Concrete (SIFCON) under Triaxial Compression, *Journal of Cement and Concrete Research*, Elsevier, Vol. 40, Issue 11, pp. 1571-1581, doi:10.1016/j.cemconres.2010.06.009.
- J44. **Y. Farnam**, S. Mohammadi, and M. Shekarchi (2010), Experimental and Numerical Investigations of Low Velocity Impact Behavior of High-Performance Fiber-Reinforced Cement Based Composite,

(ii) Book Chapters and Technical Reports:

1. P. Suraneni, J. Monical, E. Unal, **Y. Farnam**, C. Villani, T.J. Barrett, W.J. Weiss (2016), Performance of Concrete Pavement in the Presence of Deicing Salts and Deicing Salt Cocktails (p. 13), Joint Transportation Research Program, Indiana Department of Transportation and Purdue University, SPR 3864, FHWA/IN/JTRP-2016/25, doi: 10.5703/1288284316350.
2. Weiss, J. and **Y. Farnam**. 2015. Concrete Pavement Joint Deterioration: Recent Findings to Reduce the Potential for Damage. Map Brief, CP Road Map. National Concrete Pavement Technology Center, Ames, IA.
3. A. Wiese, **Y. Farnam**, W. Jones, P. Imbrock, B. Tao, and J. Weiss (2015), Evaluation of Sealers and Water proofers for Extending the Life Cycle of Concrete (p. 35), Joint Transportation Research Program, Indiana Department of Transportation and Purdue University, SPR 3523, doi: 10.5703/1288284316002.
4. D. Harris, **Y. Farnam**, R. Spragg, P. Imbrock, and J. Weiss (2015), Early Detection of Joint Distress in Portland Cement Concrete Pavements (p. 39), Joint Transportation Research Program, Indiana Department of Transportation and Purdue University, SPR 3623, doi: 10.5703/1288284315531.
5. J. Olek, T. Kim, M. Pour-Ghaz, **Y. Farnam**, Y.C. Chiu, C. Balachandran, J. Weiss, N. Whiting, and T. West (2014), Alkali-Silica Reaction (ASR) Mechanisms and Detection: An Advanced Understanding (p. 243). Federal Highway Administration, FHWA-HRT-14-078.
6. W. Jones, **Y. Farnam**, P. Imbrock, J. Sprio, C. Villani, J. Olek, and J. Weiss (2013), An Overview of Joint Deterioration in Concrete Pavement: Mechanisms, Solution Properties, and Sealers (p. 58), Joint Transportation Research Program, Indiana Department of Transportation and Purdue University, doi: 10.5703/1288284315339.
7. Co-Author in Code No. 446; Introduction to Heavy Construction Machinery; Editors: E. Forsatkar, M. Parchami, and Y. Forouzanfar; Office of deputy for strategic supervision; Bureau of Technical Execution System; 2009; ISBN 978-964-179-067-9 (In Farsi).
8. Co-Author in Code No. 447; Site Safety Management; Office of deputy for strategic supervision; Editors: E. Forsatkar, M. Parchami, and Y. Forouzanfar; Bureau of Technical Execution System; 2009; ISBN 978-964-179-070-9 (In Farsi).

(iii) Conference Papers and Presentations (* Indicates Presenting Author)

- C1. M. Balapour*, T. Thway, R. Rao, N. Moser, E. Garboczi, G.Y. Hsuan, S. Spatari, and **Y. Farnam** (2021), A thermodynamics-guided framework to design spherical lightweight aggregate from waste coal combustion ash, in: Materials Science & Technology 2021 Technical Meeting and Exhibition (MS&T21), Columbus, OH, October 17-21, 2021.
- C2. R. Deb*, A.W. Mutua, J. He, and **Y. Farnam** (2021), Effects of Thermal Cycling Rate and Pore Confinement on Thermal Behavior of Phase Change Materials in Lightweight Aggregates for Deicing and Low-Temperature Applications, in 2021 ACI Fall Concrete Convention, Atlanta, GA, October 17-21, 2021.
- C3. M.H. Khaneghahi*, J. He, and **Y. Farnam** (2021), Investigation on Protecting Mechanism of Soy Methyl Ester-Polystyrene (SME-PS) as a Concrete Surface Protectant, in 2021 ACI Fall Concrete Convention, Atlanta, GA, October 17-21, 2021.
- C4. P. Namakiaraghi* and **Y. Farnam**, Investigating the Effects of Architectural Parameters on Mechanical Properties of Additively Manufactured Parts for Construction Materials Applications, in: 2021 ACI Spring Virtual Convention, March 27-April 1, 2021.
- C5. P. Namakiaraghi*, D. Bell, Y.G. Hsuan, and **Y. Farnam** (2020), Investigating the Anisotropy in Tensile Properties of 3D-Printed Fiber-Reinforced Polymers for Reinforcement Applications, in: 2020 ACI Fall Virtual Convention, October 25-29, 2020.

- C6. M. Balapour*, T. Thway, E. Garboczi, Y.G. Hsuan, and **Y. Farnam** (2020), A Thermodynamics-based Framework for Production of Porous Lightweight Aggregate (LWA) from Waste Coal Combustion Ash (W-CCA), in: 2020 ACI Fall Virtual Convention, October 25-29, 2020.
- C7. M. Balapour*, W. Zhao, E.J.Garboczi, N.Y. Oo, S. Spatari, Y.G. Hsuan, P. Billen, and **Y. Farnam** (2020), Potential use of lightweight aggregate (LWA) produced from bottom coal ash for internal curing of concrete systems, in: Pennsylvania Concrete Conference, Harrisburg, February 19-20, 2020.
- C8. K. J. O'Hare, G. Pizzulli, M. Torelli, M. Balapour, **Y. Farnam**, Y.G. Hsuan, P. Billen, and S. Spatari* (2020), Life Cycle Assessment of Lightweight Aggregates from Coal Ashes: A Cradle-to-Gate Analysis, in: International RILEM Workshop on Concrete Durability and Service Life Planning (ConcreteLife), pp. 47-51, RILEM Bookseries, vol 26. Springer, Cham. https://doi.org/10.1007/978-3-030-43332-1_10.
- C9. M. Ksara, R. Newkirk, S.K. Langroodi, F. Althoey, C.M. Sales, C.L. Schauer, and **Y. Farnam*** (2019), Using Microbial Induced Calcite Precipitation to Mitigate Salt-Induced Damage in Concrete Exposed to CaCl₂, 2019 ACI Fall Convention, Cincinnati, OH, October 20-24, 2019.
- C10. M. Balapour, P. Billan, R. Rao, E. Garboczi, S. Spatari, G. Hsuan, and **Y. Farnam*** (2019), A Sustainable Strategy to Utilize Waste Coal Combustion Ash (CCA): Producing CCA-Based Lightweight Aggregate, in: 2019 World of Coal Ash Conference, Saint Louis, MO, May 2019.
- C11. F. Althoey*, and **Y. Farnam** (2019), Reducing Damage Due to Chemical Reactions in Concrete Exposed to Sodium Chloride: Quantification of a Deleterious Chemical Phase Change Formation, in: 2019 Tran-SET Conference, San Antonio (TX), April 2019.
- C12. M. Balapour, and **Y. Farnam*** (2019), Are Micro-Capsulated Phase Change Materials Efficient for Thermal Energy Management of Concrete Structures?, in: 2019 ACI Spring Convention, Quebec City (QC), Canada, March 2019.
- C13. F. Althoey*, and **Y. Farnam** (2019), Damage Development in Cementitious Materials Due to Chemical Phase Change Formation in the Presence of NaCl: The Effect of Using Supplementary Cementitious Materials, in: PennConcrete Conference, Harrisburg (PA), Feb 2019.
- C14. **Y. Farnam***, C. Villani, J. Jain, and J. Weiss (2018), Durability Performance of Carbonated Calcium Silicate-Based Cementitious Materials Exposed to Freezing and Thawing and Chloride-Based Salt, in: 2018 ACI Fall Convention, Las Vegas (NV), October 2018.
- C15. **Y. Farnam*** (2018) Advanced Materials for Enhancing Resilience, Durability and Sustainability of Transportation Infrastructure, in: 2018 Research Symposium, September 27-28, 2018, Pennsylvania Department of Transportation Bureau of Planning and Research, Harrisburg, PA.
- C16. D. Christe*, J.J. Bhatt, C.M Sales, and **Y. Farnam** (2018) Empowering Underrepresented Groups to Excel in STEM Through Research Sprints, in: 2018 ASEE Annual Conference & Exposition, June 24-27, 2018, Salt Lake City, UT.
- C17. F. Althoey*, and **Y. Farnam** (2018) The Effect of Temperature Variations on the Chemical Stability of Cementitious Materials Exposed to NaCl Solution, in: 9th Advances in Cement-Based Materials Conference (Cements 2018), ACerS, June 11-12, 2018, Pennsylvania State University, State College, PA.
- C18. M. Balapour*, W. Zhao, E. Garboczi, S. Spatari, G. Hsuan, and **Y. Farnam** (2018) Characterization of Spherical Porous Lightweight Aggregate Made Using Waste Coal Combustion Bottom Ash, in: 9th Advances in Cement-Based Materials Conference (Cements 2018), ACerS, June 11-12, 2018, Pennsylvania State University, State College, PA.
- C19. M. Ksara*, R. Newkirk, S.K. Langroodi, F. Althoey, C. Sales, C. Schauer, **Y. Farnam** (2018) Can Microbes Be Used to Mitigate Damage in Concrete due to Calcium Oxychloride Formation? in: National Collegiate Research Conference, NCRC 2018, January 18-20, 2018, Harvard University, Cambridge, MA.
- C20. F. Althoey, **Y. Farnam*** (2017), An Advanced Understanding of the Source of the Chemical Damage in Concrete Pavement Exposed to Sodium Chloride Deicing Salt, in: 11th University Transportation Centers Spotlight Conference, Rebuilding and Retrofitting the Transportation Infrastructure, September 26-27, 2017, Washington, DC.

- C21. P. Suraneni, C. Qiao, V. Azad, **Y. Farnam**, J. Monical, E. Unal, C. Villani, B. Isgor, and J. Weiss* (2017), A review of recent work on deicing salt damage to concrete pavements and its mitigation. International Conference on Advances in Construction Materials and Systems 2017, Chennai, India, 3 - 8 September 2017, pp 1-15.
- C22. **Y. Farnam***, H. Shagerdi, P. Zavattieri, J. Haddock, and J. Weiss (2017), Concrete Pavement Containing Phase Change Materials to Melt Snow and Ice, in: International Conference on Highway Pavement and Airfield Technology, Philadelphia, PA, August 27-30.
- C23. M. Ksara, S.K. Langroodi, E. Mayerberger, F. Althoey, C.M. Sales, C. Schauer, and **Y. Farnam*** (2017), Evaluating the Potential Use of Alginate to Enable Microbial Self- Healing in Concrete. 6th Int. Conf. Self-Healing Mater., Friedrichshafen, Germany, June 25-28, pp 1–5.
- C24. **Y. Farnam***, H.S. Esmaeeli, P.D. Zavattieri, J. Haddock, and J. Weiss; Incorporating Phase Change Materials in Concrete Pavement to Melt Ice and Snow (2016); in: ACI Fall 2016 Convention, Philadelphia, PA, October 19-27.
- C25. **Y. Farnam***, J. Monical, E. Unal, and W. J. Weiss; Development of a Low-Temperature Calorimetry Method to Quantify the Potential of Calcium Oxychloride Formation in Cementitious Materials; in: 7th Advances in Cement-Based Materials (Cements 2016), Northwestern University, Evanston (IL), July 10-13, 2016.
- C26. H. S. Esmaeeli*, **Y. Farnam**, P. D. Zavattieri, J. Weiss; Numerical Simulation of Freeze-Thaw Behavior of Cementitious Systems Containing Phase Change Materials; in: 7th Advances in Cement-Based Materials (Cements 2016), Northwestern University, Evanston (IL), July 10-13, 2016.
- C27. H. S. Esmaeeli, **Y. Farnam**, D. P. Bentz, P. D. Zavattieri and J. Weiss*; The Influence of Pore Size and Freezing Rate on Ice Formation in Concrete; in: 2016 International Concrete Sustainability Conference, RILEM Symposium on Self-Compacting Concrete and North American Conference on Design and Use of Self-Consolidating Concrete, Washington (DC), May 15-18, 2016.
- C28. J. Weiss*, **Y. Farnam**, and J. Jain; Performance of Carbonated Calcium Silicate Concrete Exposed to NaCl, CaCl₂, and MgCl₂ Deicing Salt; in: 2016 ACI Spring Convention, Milwaukee (MI), April 2016.
- C29. J. Monical, E. Unal, T. Barrett, **Y. Farnam***, and W. Weiss; Reducing Joint Damage in Concrete Pavements: Quantifying Calcium Oxychloride Formation for Concrete Made Using Portland Cement, Portland Limestone Cement, Supplementary Cementitious Materials, and Sealers; in: Transportation Research Board 95th Annual Meeting, Washington (DC), January 2016.
- C30. **Y. Farnam**, H.S. Esmaeeli, D. Bentz, P. Zavattieri, and J. Weiss*; Experimental and Numerical Investigation on the Effect of Cooling/Heating Rate on the Freeze-Thaw Behavior of Mortar Containing Deicing Salt Solution; in: International Conference on the Regeneration and Conservation of Concrete Structures (RCCS), Nagasaki (Japan), June 2015, pp. 1-12.
- C31. **Y. Farnam***, D. Bentz, and J. Weiss; The Influence of Deicing Salts on Damage Development and Phase Changes in Concrete, 2015 PEGASAS Annual Meeting, Federal Aviation Administration, West Lafayette (IN), May 2015.
- C32. **Y. Farnam***, H. Todak, R. Spragg, and J. Weiss; Using Acoustic Emission and Electrical Resistivity to Assess Freeze-Thaw Damage in Concrete; in: AEWG 57th Conference on Acoustic Emission, Chicago (IL), May 2015.
- C33. **Y. Farnam** and J. Weiss*; A New Look at an Old Problem: Reexamining the Saltwater Phase Diagrams to Better Describe Concrete Durability; in: 2015 ACI Spring Convention, Kansas City (MO), April 2015.
- C34. C. Villani, **Y. Farnam**, T. Washington, J. Jain, and J. Weiss*; Performance of Conventional Portland Cement and Calcium Silicate Based Carbonated Cementitious Systems During Freezing and Thawing in the presence of Calcium Chloride Deicing Salts; in: Transportation Research Board 94th Annual Meeting, Washington (DC), January 2015, pp. 1–16.
- C35. **Y. Farnam*** and J. Weiss; Service-Life and Freeze-Thaw Deterioration: What Classic Phase Diagrams Tell us and Where They Fall Short for Cements; in: Anna Maria Workshop XV: Durability and Service-Life Prediction, Anna Maria (FL), November 2014.

- C36. M. Krafcik*, **Y. Farnam**, L. Liston, J. Weiss, B. Tao, and K. Erk; Phase Change Materials for Use in Self-heating Concrete to Prevent the Buildup of Ice and Snow on Pavement Surfaces; in: Materials Science & Technology 2014: Nanotechnology for Energy, Environment, Electronics, and Industry, Pittsburgh (PA), October 2014.
- C37. L. Liston, M. Krafcik, **Y. Farnam***, B. Tao, K. Erk, and J. Weiss; Toward the Use of Phase Change Materials (PCM) in Concrete Pavements: Evaluation of Thermal Properties of PCM; in: 2014 FAA Worldwide Airport Technology Transfer Conference: Innovations in Airport Safety and Pavement Technologies, Federal Aviation Administration (FAA), Galloway (Oceanville), New Jersey, USA, August 2014, pp. 1-13.
- C38. Y. Qian, **Y. Farnam***, J. Weiss; Using Acoustic Emission to Quantify Freeze-Thaw Damage of Mortar Saturated with NaCl Solutions, In: 4th International Conference on the Durability of Concrete Structures, West Lafayette, Indiana, USA, July 2014, pp. 1-7.
- C39. A. Miller*, R. Spragg, F. Antico, W. Ashraf, T. Barrett, A. Behnood, Y. Bu, Y. Chiu, B. Desta, **Y. Farnam**, H. Jeong, W. Jones, C. Lucero, D. Luo, F. Macobatti, C. Nickel, P. Panchmatia, K. Pin, S. Qiang, C. Qiao, H. Shagerdi, Q. Tian, R. Tokpotayeva, C. Vilani, A. Wiese, S. Woodard, and W. J. Weiss, "Determining the Moisture Content of Pre-Wetted Lightweight Aggregate: Assessing the Variability of the Paper Towel and Centrifuge Methods, In: 4th International Conference on the Durability of Concrete Structures, West Lafayette, Indiana, USA, July 2014, pp. 1-5.
- C40. **Y. Farnam**, D. Bentz, A. Hampton, and J. Weiss*; Acoustic Emission and Low Temperature Calorimetry Study of Freeze and Thaw Behavior in Cementitious Materials Exposed to NaCl Salt; in: Transportation Research Board 93rd Annual Meeting, Washington, DC, USA, January 2014, pp. 1-19.
- C41. **Y. Farnam***, D. Bentz, A. Sakulich, D. Flynn, and J. Weiss; Evaluation of Freeze and Thaw Damage in Mortars Containing Deicing Salt Using A Low Temperature Guarded Comparative Longitudinal Calorimeter and Acoustic Emission; in: 4th Advances in Cement-based Materials: Characterization, Processing, Modeling and Sensing, University of Illinois at Urbana-Champaign, Urbana, IL, USA, July 8-10, 2013.
- C42. **Y. Farnam***, D. Bentz, A. Sakulich, D. Flynn, and J. Weiss; Using Acoustic Emission to Quantify Damage in Cementitious Materials Exposed to Freezing and Thawing; in: AEWG 55th conference on acoustic emission, Anaheim/Los Angeles, CA, USA, June 11-13, 2013.
- C43. T. Rahmani*, B. Kiani, F. Sami, B.N. Fard, **Y. Farnam**, M. Shekarchi, Durability of glass, polypropylene and steel fiber reinforced concrete, in: Proceedings of 12th International Conf. on Durability of Building Materials and Components, Porto (Portugal), April 2011, Article No. T31, pp. 1-8.
- C44. **Y. Farnam***, A. Behrouzikhah, F.S. Sabet, S.M Jalili, M. Shekarchi, The effect of cement content on concrete durability with respect to environmental compatibility, in: Proceedings of 4th International Conf. on Construction Materials (ConMat'09), Nagoya (Japan), August 2009, pp. 289-294.
- C45. **Y. Farnam***, S. Mohammadi, A. Bagherzadeh, S.K. Babanejad, Numerical simulation of concrete beam under low velocity impact, in: Proceedings of 4th International Conf. on Construction Materials (ConMat'09), Nagoya (Japan), August 2009, pp. 185-190.
- C46. **Y. Farnam***, M. Shekarchi, A. Mirdamadi, Experimental investigation of impact behaviour of high strength fiber reinforced concrete panels, in: Proceedings of the 2nd International Symposium on Ultra High Performance Concrete, Kassel (Germany), March 2008, pp. 751-758.
- C47. **Y. Farnam**, M. Mahoutian, S. Mohammadi, M. Shekarchi*, Experimental and numerical studies of impact behavior of fiber lightweight aggregate concrete, in: Proceedings of ASCE & SEI 2008 Structures Conf., Vancouver (Canada), April 2008, pp. 1-10.
- C48. **Y. Farnam***, S. Mohammadi, M. Shekarchi M, Study of impact behavior of slurry-infiltrated fiber concrete, in: Proceedings of the 4th National Congress in Civil Engineering, Tehran (Iran), May 2008, pp. 1-8 (in Farsi).

INVITED TALKS

- 1- Solid waste coal combustion ashes: Are they appropriate feedstock to produce construction aggregates? University of California, Irvine, CA (Nov 2020).
- 2- Infrastructure Materials for 21st Century: Exploring Advanced and Sustainable Materials, and Improving Concrete Durability in Cold Environment, University of Delaware, Newark, DE (March 2020).
- 3- Advanced Materials Development to Enhance Resilience, Durability and Sustainability of Civil Infrastructure, Louisiana State University, Baton Rouge, LA (January 2019).
- 4- Snow Melting Concrete, Taste of Science-Philadelphia, Philadelphia, PA (April 2018).
- 5- Advanced Construction Materials for Enhancing Resilience, Durability and Sustainability of Civil Infrastructure, University of Southern California, Los Angeles, CA (March 2018).
- 6- An Overview of Drexel ASIM Research on Improving Durability and Sustainability of Civil Engineering Materials, Pennsylvania State University, State College, PA (Feb 2018).
- 7- Towards a Sustainable Solution to Melt Snow and Ice on Concrete Pavement: Use of Phase Change Materials, Eastern Pennsylvania and Delaware American Concrete Institute Chapter, King of Prussia, PA (Nov. 2017).
- 8- Use of Sustainable and Innovative Construction Materials to Enhance Civil Engineering Practices, Temple University, Philadelphia, PA (Oct. 2017).
- 9- Freeze-Thaw Durability of Concrete Pavements: Physical/Chemical Sources of Damage and Methods for Damage Mitigation, Federal Highway Administration (FHWA) Turner-Fairbank Highway Research Center, McLean, VA, (June 2017).
- 10- Advanced Understanding of Concrete Durability Exposed to Freezing and Thawing and Chloride-Based Deicing Salts, Rutgers University, Piscataway, NJ (April 2017).
- 11- Developing Resilient and Sustainable Concrete for Transportation Infrastructure, Pennsylvania Department of Transportation (PennDOT), Harrisburg, PA (Nov. 2016).
- 12- Towards Developing Resilient and Sustainable Infrastructure: Service Life Assessment/Improvement, and Advanced Materials Development, University of Pittsburgh, Pittsburgh, PA (Feb 2015).

PATENTS

- Method of Lightweight Aggregates Production from Waste-Coal Combustion Ash, International Application No.: PCT/US20/56976, Filled on 23-OCT-2020 (Pending)

AWARDED GRANTS

(i) [Since Joining Drexel University \(Sep. 2016 – Present\)](#)

	<u>External</u>	<u>Internal</u>	<u>Grand Total</u>
- As Principal Investigator:	\$1,647,709	\$165,059	\$1,812,768
- Total:	\$2,839,469	\$352,810	\$3,192,279

Title	Sponsor	Total Budget	Duration	Role (Credit)	Collaborators
Internal Curing with Fine Light Weight Aggregate (FLWA) Created from Unsuitable Coal Combustion Ash	PA Department of Transportation (PennDOT)	\$224,411	Finalizing contract	PI (100%)	-

SBIR Phase I: Sustainable Engineering of Lightweight Aggregate for Concrete Use from Waste Coal Combustion Ash	National Science Foundation	\$255,755	08/2021-07/2021	Senior Personnel (Through SusMaX LLC)	PI: M. Balapour
Developing a thermodynamic-guided manufacturing process to produce sustainable lightweight aggregate from waste coal combustion ash and waste glass	PA Department of Community and Economic Development	\$140,000 (including \$70,000 cost-share)	05/2021-08/2022	PI (75%)	Co-PI: G. Hsuan
Co-op Opportunities Program Fund	Drexel Steinbright Career Development Center	\$6,000	03/2021-09/2021	PI (100%)	-
Engineering Bioinspired Multifunctional Microbial Polymeric Fiber (BioFiber) for Concrete Self-Healing	National Science Foundation	\$555,589	12/2020-11/2023	PI (40%)	Co-PIs: - C. Schauer, - C. Sales - A. Najafi
Developing Phase Change Materials for Concrete Deicing Applications	Compass Minerals Inc.	\$176,833	09/2020-08/2022	PI (100%)	-
Effectiveness of Soybean-Based Sealant to Reduce Deicing Salt Damage in Concrete	United Soybean Board and Indiana Soybean Alliance	Phase I: \$60,000	11/2019-10/2020	PI (100%)	-
		Phase II: \$75,000	10/2020-12/2021		
Advanced Manufacturing of Architected Fiber-Reinforced Cementitious Composite	PA Department of Community and Economic Development	\$129,754 (including \$64,877 cost-share)	02/2020-05/2021	PI (100%)	-
PFI-TT: Development of Scalable Lightweight Aggregate Manufacturing from Waste Coal Combustion Ash	National Science Foundation	\$370,999	07/2019-06/2023	PI (100%)	-
Graduate Assistance in Areas of National Need (GAANN) on "Materials for Environmental Sustainability"	US Department of Education	\$938,756 (including \$187,751 cost-share)	10/2018-Present	Senior Personnel	PI: C. Schauer
I-Corps: Production of Lightweight Aggregate from Waste Bottom Ash	National Science Foundation	\$50,000	01/2018-05/2019	PI (100%)	-
EAGER: Spherical Porous Reactive Aggregates from Coal Bottom A	National Science Foundation	\$185,000	09/2016-08/2019	Co-PI	PI: S. Spatari
Microbial Self-Healing Cementitious Composite	Drexel University Office of Research	\$7,000	06/2018-09/2018	PI (100%)	-
Acquisition of Ultrasonic Pulse Velocity and Electrical Resistivity Instruments for Education in the Area of Construction Materials	Drexel University	\$9,932	04/2018-07/2018	PI (100%)	-
Concrete with Robust Microbial-Based Self-Healing Functionality	Drexel Steinbright Career Development Center	\$7,250	09/2017-12/2017	PI (100%)	-

(ii) Before Joining Drexel University

Title	Sponsor	Budget	Duration	Role	Collaborators
Damage in Cementitious Materials Exposed to Deicing Salts	Portland Cement Association, USA	\$20,000	05/2014-05/2015	Awardee (100%)	- Jason Weiss
Effect of Rheology on Mechanical Performance, Fatigue Resistance and Bond Strength of Fiber Reinforced Self-Consolidating Concrete	Quebec Ministry of Education, Recreation and Sports, Canada	\$33,334	2011-2012	Awardee (100%)	
Chemical Analysis Lab for Construction Materials, Construction Materials Institute, University of Tehran	Mosharaf Foundation, Iran	\$10,000	2010	Co-Awardee	Awardee: M. Shekarchi
Impact Behavior of Ultra-High-Performance Concrete	Ministry of Defense, Iran	\$1,500	2007	Awardee (100%)	Co-Awardee: S. Mohammadi

EDUCATIONAL ACTIVITIES

(i) Course Taught

Since Joining Drexel University:

- ENGR 111: Introduction to Engineering Design & Data Analysis, 3 Credits, Guest Instructor, Drexel University, PA
- CAEE 202: Introduction to Civil, Architectural & Environmental Engineering, 3 Credits, Guest Instructor, Drexel University, PA
- CIVE 615: Infrastructure Condition Evaluation, 3 Credits, Co-Instructor, Drexel University, PA
- CIVE 520: Advanced Concrete Technology, 3 Credits, Drexel University, PA
- CIVE 250-A: Construction Materials, 3 Credits, Drexel University, PA
- CIVE 250-001: Construction Materials Laboratory, 1 Credits, Drexel University, PA

Before Joining Drexel University:

- CE 331: Engineering Materials II, 3 Credits, Purdue University, IN
- CE 331 (3-6-7-9): Engineering Materials II Laboratory, Purdue University, IN
- CE 530: Properties, Production and Performance of Concrete, Purdue University, IN
- Workshop courses: (1) Significance and Applicability of High-Performance Concrete (HPC), (2) Mix Design for HPC, and (3) Production Methods for HPC, University of Tehran, IRAN

(ii) Mentorship

- Faculty Advisor, Drexel American Society of Civil Engineers (ASCE) Student Chapter, Drexel University, PA, Since 2021.
- Founder and Faculty Advisor, Drexel American Concrete Institute (ACI) Student Chapter, Drexel University, PA, Since 2017.
- Faculty Advisor, Drexel American Society of Highway Engineers (ASHE) Student Chapter, Drexel University, PA, Since 2017.
- CIVE 477, and 478: Senior Seminar, 3 Credits, Drexel University, PA
- CAE 491, 492, and 493: Senior Design Project, 9 Credits, Drexel University, PA

(iii) PhD Dissertation Committee

- Mohammad Balapour, Ph.D., Graduated in Summer 2021, Advisor: Yaghoob Farnam, Thesis title: Conversion of Waste Coal Combustion Ash to Value-Added Construction Lightweight Aggregates through A Holistic Thermodynamics-Guided Manufacturing Framework, Drexel University.
- Fadi Althoey, Ph.D., Graduated in Spring 2019, Advisor: Yaghoob Farnam, Thesis title: Understanding and Mitigating Damage Development in Cementitious Materials Exposed to Sodium Chloride, Drexel University
- Parsa Namaki Araghi, PhD Candidate, Expected Graduation Date: Summer 2023, Advisor: Yaghoob Farnam, Research Area: Advanced manufacturing of bio-inspired microvascular thermal-responsive composites, Drexel University
- Long Nguyen, Ph.D., Advisor: Sabrina Spatari, Thesis title: Life Cycle Environmental and Cost Aspects of High-Density Polyethylene and Alternatives in Drainage Applications, Drexel University (Graduated: Spring 2017)
- Siavash Vahidi, Ph.D. Student, Advisor: Grace Hsuan, Thesis title: The Failure Mechanism of High Density Polyethylene (HDPE) under Mechanical Loads and Photo-Chemical Degradation, Drexel University (Expected Graduation: Summer 2019)
- Hadi Shagerdi Esmaceli, Ph.D. Student, Advisor: Pablo Zavattieri, Purdue University (Expected Graduation: Fall 2018)
- Mohsen Foroughi, Ph.D. Student, Advisor: James Lo, Drexel University (Expected Graduation: Fall 2021)

(iv) Outreach Activities

- 2-Day K-12 Summer Workshop, Self-Healing BioConcrete, August 2021, Eureka Summer Camp, Girls Inc. Philadelphia.
- Taste of Science-Philadelphia, Guest Speaker, April 24, 2018, Philadelphia Science Festival.
- Organizing and Technical Committee Member, K-12 STEM Scholar Workshop: Engineer Your City with Self-Healing Infrastructure, Summer 2017, Franklin Institute STEM Scholar and Elsevier.
- Organizing Member, Middle School STEM Girls Summer Camp, Summer 2017, Girls Inc. Philadelphia.

STUDENTS ADVISED/MENTORED

(i) Postdoctoral and Research Associates

Current:

- **Mohammad Balapour**, PhD
Research Area: Sustainable Engineering of Lightweight Aggregate for Concrete Use from Waste Coal Combustion Ash

Former:

- **Jialuo He**, PhD
Research Area: Effectiveness of Soybean-Based Sealant to Reduce Deicing Salt Damage in Concrete

(ii) PhD Students

Current:

- **Yousif Alqenai**, PhD Student, Expected Graduation Date: Summer 2025
- **Sharaniya Visvalingam**, PhD Student, Expected Graduation Date: Summer 2025
- **Robin Deb**, PhD Student, Expected Graduation Date: Fall 2024
- **Mohammad Houshmand**, PhD Student, Expected Graduation Date: Fall 2024

- **Angela Mutua**, PhD Student, Expected Graduation Date: Summer 2024
- **Parsa Namaki Araghi**, PhD Candidate, Expected Graduation Date: Summer 2023
Research Area: Advanced manufacturing of bio-inspired polymeric reinforcement for concrete

Former:

- **Mohammad Balapour**, PhD, Graduation Date: August 2021
Thesis title: Conversion of Waste Coal Combustion Ash to Value-Added Construction Lightweight Aggregates through A Holistic Thermodynamics-Guided Manufacturing Framework
- **Fadi Althoey**, PhD, Graduation Date: June 2019
Thesis title: Understanding and Mitigating Damage Development in Cementitious Materials Exposed to Sodium Chloride

(iii) MSc Students

Current:

- **None**

Former:

- **Rathin Rao**, Graduation Date: Fall 2020
Thesis title: Non-Thesis MS
- **Dane Bell**, Graduation Date: Summer 2020
Thesis title: Using Additive Manufacturing to Develop Shape Topology Optimization of Internal Structures for Reinforced Concrete Designs
- **Mohammad Balapour**, Graduation Date: December 2019
Thesis title: Characterizing physical properties of lightweight aggregate made from waste coal ash using x-ray computed tomography
- **Maissoun Ksara**, Graduation Date: June 2018
*Thesis title: Evaluating the Use of *S. pasteurii* on Mitigating the Damage Response of Cementitious Materials Exposed to Calcium Chloride*
- **Weijin Zhao**, Graduation Date: Dec 2017
Thesis title: Evaluation of Potential Use of Spherical Porous Reactive Aggregate (SPoRA) for Internal Curing of Cementitious System
- **Yasmina Shields**, Graduation Date: June 2017
Thesis title: Freeze-thaw crack determination in cementitious materials using 3D X-ray computed tomography and acoustic emission

(iv) Undergraduate Students

- Liam McNally, Drexel University (Winter 2021-Present)
- Christian Albert, Drexel University (Spring 2021-Present)
- Thiha Thway, Drexel University (Fall 2019-Fall 2020)
- Alejandro Ochoa, Drexel University (Fall 2020)
- Engy Khoshit, Drexel University (Winter 2020-Spring 2020)
- Jessica Butterly, Drexel University (Fall 2018-Winter 2019)
- Angela Mutua, Drexel University (Winter 2018-Summer 2018)
- Rayna Newkirk, Drexel University (STAR Scholar, Summer 2017-Fall 2017)
- Patrick Stoehr, Drexel University (Fall 2017-Summer 2018)
- Nay Ye Oo, Drexel University (Winter-Summer 2017)
- Robert Howell, Drexel University (STAR Scholar, Summer 2017)
- Bochen Zhang, Purdue University (SURF Fellow, Summer 2014)
- Allison Hampton, Purdue University (SURF Fellow, Summer 2013)
- Taylor Washington, Purdue University (2013-2016)

- Khalela El-Naggar, Purdue University (2015-2016)
- Mitchell Rector, Purdue University (Fall 2015)
- Sarah Dick, Purdue University (2012-2013)
- Martin Bobcek, Purdue University (2012-2013)

(v) K-12 STEM Scholars

- Noah Rosen, Bethesda Chevy Chase High School, Bethesda, MD (Summer 2021)
- Noel Clarke, Upper Darby High School, Upper Darby, PA (Summer 2021)
- Kiyah Talley, Central High School, Philadelphia, PA (Summer 2021).
- Nimah Amedu, West Chester East High School, West Chester, PA (Summer 2021).
- Devon Mignone, Conestoga High School, Chester County, PA (Summer 2021).
- Jaiquan Boykins, Lankenau Environmental Science Magnet High School, Philadelphia, PA (Summer 2017)
- Jannat Williams, Freire Charter High School, Philadelphia, PA (Summer 2017)

PROFESSIONAL AND SERVICE ACTIVITIES

(i) University Service Activities

- Drexel CAEE Department Faculty Representative, Undergraduate Open House, Sunday Aug 22, 2021.
- Member, Civil Engineering Program Committee, 2021-present
- Member, Drexel CAEE Strategic Planning Committee, 2021-present
- Member, Drexel College of Engineering Award Selection Committee, 2020-present
- Speaker, Lettuce Talk About Research, Drexel ASCE Student Organization Speaker, March 2020.
- Member, Drexel CAEE Curriculum Committee, 2020-present.
- Drexel CAEE Department Faculty Representative, Undergraduate Open House, Sunday, Feb 16, 2020.
- Member, Drexel College of Engineering Graduate Programs Committee, 2020.
- Member, Drexel College of Engineering Strategic Planning Committee: Talent Cultivation Working Team, 2019.
- Organizer, PennDOT Staff and Research Directors Visit to College of Engineering Research Capabilities, August 2019.
- Drexel CAEE Department Faculty Representative, Undergraduate Open House, Saturday, August 18, 2019
- CAEE Department One-on-One Perspective Student Meeting, July 2019.
- Drexel CAEE Department Construction Materials Teaching Lab Update, Summer 2018.
- Drexel CAEE Department Faculty Representative, Undergraduate Open House, Saturday, March 3, 2018
- Member, Drexel College of Engineering Strategic Planning for Research Committee, Cyber-Physical Infrastructure and Advanced Manufacturing, 2017-2018.
- Drexel ASCE Student Organization Speaker, 2017 and 2018.
- Member, CIVE 375 Curriculum Review Committee Member, Fall 2017, Drexel University, PA
- Member, CAEE Department Recruitment and Outreach Activities Committee, Fall 2016 - Spring 2017, Drexel University, PA
- Drexel CAEE Department Representative, Graduate Open House, Saturday, March 18, 2017
- Drexel CAEE Department Representative, Graduate Open House, Saturday, October 22, 2016

(ii) Professional Committee Activities

- Visiting Board Member, Eastern Pennsylvania and Delaware Chapter, American Concrete Institute
- Voting Member, ACI Committee 242: Alternative Cements, American Concrete Institute

- Voting Member, ACI Committee 564: 3-D printing with Cementitious Materials, American Concrete Institute
- Voting Member, ACI Committee 123: Research and Current Developments, American Concrete Institute
- Associate Member, ACI Committee 236: Material Science of Concrete, American Concrete Institute
- Associate Member, ACI Committee 201: Durability of Concrete, American Concrete Institute
- Committee Communications Coordinator, TRB AFN 10: Standing Committee on Basic Research and Emerging Technologies Related to Concrete, National Research Council, The National Academies of Sciences, Engineering, and Medicine
- Associate Member, TRB AFN 30: Standing Committee on Durability of Concrete (AFN 30), National Research Council, The National Academies of Sciences, Engineering, and Medicine
- Associate Member, TRB A0040T: Design and Construction Group Younger Member Subcommittee, National Research Council, The National Academies of Sciences, Engineering, and Medicine

(iii) Professional Membership

- Member of American Concrete Institute (ACI)
- American Ceramic Society (ACerS)
- Acoustic Emission Working Group (AEWG)
- Transportation Research Board (TRB)
- American Society of Civil Engineering (ASCE)
- American Society of Engineering Education (ASEE)
- American Society for Testing and Materials (ASTM International)

(iv) Professional Conference/Workshop Activities

- Session Moderator, ACI 123 Concrete Research Poster Session, ACI Spring 2021 Convention, Virtual, March 28-April 1, 2021.
- Session Moderator, ACI 123 Concrete Research Poster Session, ACI Fall 2020 Convention, Virtual, October 25-29, 2020.
- Session Moderator, ACI 123 Concrete Research Poster Session, ACI Fall 2019 Convention, Cincinnati, OH, October 20-24, 2019,
- Session Moderator, ACI 123 Concrete Research Poster Session, ACI Spring 2019 Convention, Quebec City, QC, March 23–27, 2019.
- Conference Scientific Committee Member, 2019 Tran-SET Conference, San Antonio (TX), April 11-12, 2019.
- Session Organizer and Chair, 3D Printing of Cement-Based Materials: Recent Advancements, Potential Challenges and Future Opportunities for Transportation Industry, Transportation Research Board Meeting, National Research Council, Jan 2019, Washington DC.
- Conference Session Chair, Hard Matter Self-Healing Materials 8, 6th International Conference on Self-Healing Materials, Friedrichshafen, Germany, June 25-28, 2017.
- Member of Organizing Committee, International Conference on Advances and Innovations in Engineering, Firat University, Faculty of Engineering in Elazığ, Turkey, May 10-12, 2017.
- Member of Scientific and Technical Committee, International Conference on Advances and Innovations in Engineering, Firat University, Faculty of Engineering in Elazığ, Turkey, May 10-12, 2017.
- Webinar Organizer and Moderator, Advances in Concrete Pavement Joint Durability, Transportation Research Board Meeting, National Research Council, March 2017.
- Conference Session Chair, Performance of Accelerated Concrete: Practical Applications and How They are Working, Transportation Research Board Meeting, National Research Council, Jan 2017, Washington DC.

- Organizing Team Assistant, 4th International Conference on the Durability of Concrete Structures, West Lafayette, Indiana, July 2014
- Organizing Team Assistant, 4th North American Conference on the Design and Use of SCC and 6th International RILEM Symposium on Self-Compacting Concrete: Design, Production, and Placement of SCC, Montreal, Canada, September 2010

(v) Professional Journals/Conferences Activities

Editorial Board Member:

- ASCE Journal of Materials in Civil Engineering, ASCE
- Transportation Research Record, Journal of Transportation Research Board
- Journal of Sustainability, MDPI

Reviewer:

- Journal of Cement and Concrete Composite (Elsevier)
- Journal of Cement and Concrete Research (Elsevier)
- Journal of Construction and Building Materials (Elsevier)
- Journal of Materials and Structures (Springer)
- ACS Sustainable Chemistry & Engineering (ACS)
- Advances in Civil Engineering Materials (ASTM International)
- Journal of Materials in Civil Engineering (ASCE)
- Journal of Nondestructive Evaluation (Springer)
- Transportation Research Record: Journal of the Transportation Research Board (TRB)
- American Concrete Institute (ACI) Journals and Special Publications
- International Journal of Impact Engineering (Elsevier)
- International Conference on New Material and Chemical Industry

MEDIA COVERAGE

- **EXEL**, Drexel University Research Magazine, Ashes to Concrete, 2021, Nature, Environment and Sustainability, <https://exelmagazine.org/article/ashes-to-concrete/>.
- **Physics Today**, Recycled coal ash makes better concrete, November 1, 2019, by: Mark Wilson, link: <https://physicstoday.scitation.org/doi/10.1063/PT.6.1.20191101a/full/>, doi: 10.1063/PT.6.1.20191101a
- **Sustainability Matters**, Rising from coal ash waste to cure concrete, November 8, 2019, link: <https://www.sustainabilitymatters.net.au/content/waste/article/rising-from-coal-ash-waste-to-cure-concrete-1050673907>.
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