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EDUCATION

- Northwestern University, Evanston, IL (9/12-7/16): Ph.D. in Civil Engineering. Advisor: Giuseppe Buscarnera. Thesis: Effect of water particle interactions on the crushing of granular materials.
- Louisiana State University, Baton Rouge, LA (9/10-8/12): M.S. in Civil Engineering. Advisor: Murad Abu-Farsakh. Thesis: Numerical study of laterally loaded batter pile groups with the application of anisotropic modified Cam-Clay model.
- Zhejiang University, Hangzhou, China (7/06-7/10): B.S. in Civil Engineering.

ACADEMIC APPOINTMENTS

- Associate Professor (8/24 – present): Department of Civil, Environmental, and Architectural Eng., Geotechnical Engineering and Geomechanics, University of Colorado Boulder, Boulder, CO.
- Assistant Professor (8/16 – 8/24): Department of Civil, Environmental, and Architectural Eng., Geotechnical Engineering and Geomechanics, University of Colorado Boulder, Boulder, CO.
- Doctoral Researcher (9/12 – 7/16): Department of Civil and Environmental Engineering, Northwestern University, Evanston, IL.

AWARDS

- Faculty Early Career Development Program (CAREER) (2023). National Science Foundation, USA.
- Early Career Research Award (2022). Department of Civil, Environmental, and Architectural Eng., University of Colorado Boulder, Boulder, CO.
- Future Leaders (2021). American Rock Mechanics Association (ARMA)
- Terminal Year Fellowship (9/15 – 7/16). Northwestern University, Evanston, IL.
- Water P. Murphy Fellowship (9/12 – 9/13). Northwestern University, Evanston, IL.

PUBLICATIONS

Refereed journal articles published

[J1]. Behboodi, M.[†], Eskandari-Ghadi, M.[†], Xia, W., **Zhang, Y.**[*] An analytical model for the bending and reaction force of hygroscopic bilayers upon water adsorption. *International Journal of Solids and Structures* **309**, 113191, DOI: 10.1016/j.ijsolstr.2024.113191.

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[*] Corresponding author
[†] Primary graduate student advisee
[‡] Visiting PhD advisee
[§] Visiting research scholar
[**] Secondary graduate student advisee
[††] Primary post-doc advisee

[J2]. Kokash, Y.[†], Regueiro, R., Miller, N., **Zhang, Y.**[*] A non-isothermal breakage-damage model for plastic-bonded granular materials incorporating temperature, pressure, and rate dependencies. *International Journal of Solids and Structures* **305**, 113085, DOI: 10.1016/j.ijsolstr.2024.113085.

[J3]. Wen, Y.[†], **Zhang, Y.**[*] (2024) Fabric-based jamming phase diagram for frictional granular materials. *Soft Matter* **20**, 3175-3190, DOI: 10.1039/D3SM01277H.

[J4]. Wang, Y. [††], **Zhang, Y.**[*] (2023) Effect of relative humidity on the creep rate of rock salts at low stress regime. *Rock Mechanics and Rock Engineering* **56**(12), 8711-8721, DOI: 10.1007/s00603-023-03518-6.

[J5]. Chen, T.H., Hu, Z.[‡*], Yang, Z.X., **Zhang, Y.** (2023) A resolved CFD–DEM investigation into the onset of suffusion: effect of confining pressure and stress anisotropy. *International Journal for Numerical and Analytical Methods in Geomechanics* **47**(16), 3018-3043, DOI: 10.1002/nag.3611.

[J6]. Ghazanfari, S., Alesadi, A., Liao, Y., **Zhang, Y.** and Xia, W.[*] (2023) Molecular insights into the temperature and pressure dependence of mechanical behavior and dynamics of Na-montmorillonite clay. *Nanoscale Advances* **5**(20), 5449-5459, DOI: 10.1039/D3NA00365E.

[J7]. Zhou, X.[†], **Zhang, Y.**[*] (2023) Implementation and verification of a user-defined element (UEL) for coupled thermal-hydraulic-mechanical-chemical (THMC) processes in geological media. *International Journal for Numerical and Analytical Methods in Geomechanics* **47**(11), 2153-2190, DOI: 10.1002/nag.3556.

[J8]. Nakagawa[*], S, **Zhang, Y.**, Eskandari-Ghadi[†], M., Vasco, D.W. (2022) Corrections of Double-Torsion (DT) subcritical crack growth tests for crack profile geometry. *Theoretical and Applied Fracture Mechanics* **124**, 103752, DOI: 10.1016/j.tafmec.2023.103752.

[J9]. Eskandari-Ghadi, M.[†], Hang, D., Nakagawa, S., Pride, S., Gilbert, B., **Zhang, Y.**[*] (2022) The role of surface forces in environment-enhanced cracking of brittle solids. *Journal of Mechanics and Physics of Solids* **172**, p.105162, DOI: 10.1016/j.jmps.2022.105162.

[J10]. Hu, Z.[‡], Li, J., **Zhang, Y.**[*], Yang, Z.X., Liu, J. (2022) A CFD-DEM study on the suffusion and shear behaviors of gap-graded soils under stress anisotropy. *Acta Geotechnica* **18**(6), 3091-3110, DOI: 10.1007/s11440-022-01755-7.

[J11]. Hu, Z.[‡], Yang, Z.X., Guo, N.[*], **Zhang, Y.** (2022) Multiscale modeling of seepage-induced suffusion and slope failure using a coupled FEM–DEM approach, *Computer Methods in Applied Mechanics and Engineering* **398**, p. 115177, DOI: 10.1016/j.cma.2022.115177

[J12]. Sisodiya, M.[†], **Zhang, Y.**[*] (2022) A directional microcrack damage theory for brittle solids based on continuous hyperplasticity. *International Journal of Damage Mechanics* **31**(9), 1320-1348, DOI:10.1177/10567895221095890.

[J13]. Eskandari-Ghadi, M.[†], **Zhang, Y.**[*] (2022) Effect of pore size distribution on sorption-induced deformation of porous materials: A theoretical study. *International Journal of Solids and Structures* **242**. 111533, DOI: 10.1016/j.ijsolstr.2022.111533.

[J14]. Wen, Y.[†], **Zhang, Y.**[*] (2022) Relation between void ratio and contact fabric of granular soils. *Acta Geotechnica* **17**, 4297–4312, DOI: 10.1007/s11440-022-01507-7.

[J15]. Li, Z., Liao, Y., Zhang, Y., **Zhang, Y.**, Xia, W.[*] (2021) Microstructure and dynamics of nanocellulose films: Insights into the deformational behavior. *Extreme Mechanics Letters* **50**, p.101519, DOI: 10.1016/j.eml.2021.101519.

[J16]. Sisodiya, M.[†], **Zhang, Y.**[*] (2021) A time-dependent directional damage theory for brittle rocks considering the kinetics of microcrack growth. *Rock Mechanics and Rock Engineering* **55**(5), 2693–2710, DOI: 10.1007/s00603-021-02577-x.

[J17]. Singh, S.[†], Zurakowski, Z., Dai, S., **Zhang, Y.**[*] (2021) Effect of grain crushing on hydraulic conductivity of tailings sand. *Journal of Geotechnical and Geoenvironmental Engineering* **147**(12), DOI: 10.1061/(ASCE)GT.1943-5606.0002667.

[J18]. Wen, Y.[†], **Zhang, Y.**[*] (2021) Evidence of a Unique Critical Fabric Surface for Granular Soils. *Géotechnique* **73**(5), 439-454, DOI: 10.1680/jgeot.21.00126.

[J19]. Sisodiya, M.[†], Singh, S.[†], Thomas, D., **Zhang, Y.**[*] (2021) Effect of water-rock interaction on the axial capacity of drilled caissons socketed in claystone bedrock. *Journal of Geotechnical and Geoenvironmental Engineering* **147**(10), 04021097-1. DOI: 10.1061/(ASCE)GT.1943-5606.0002600.

[J20]. Eskandari-Ghadi, M.[†], **Zhang, Y.**[*] (2021) Mechanics of shrinkage-swelling transition of microporous materials at the initial stage of adsorption. *International Journal of Solids and Structures* **222**, p.111041, DOI: 10.1016/j.ijsolstr.2021.111041.

[J21]. Zhou, X.[†], Liu, S., **Zhang, Y.**[*] (2021) Permeability Evolution of Fractured Sorptive Geomaterials: A Theoretical Study on Coalbed Methane Reservoir. *Rock Mechanics and Rock Engineering* **54**(7), 3507-3525. DOI: 10.1007/s00603-021-02404-3.

[J22]. Hu, Z.[‡], Yang, Z.X.[*], **Zhang, Y.** (2020) CFD-DEM modeling of suffusion effect on undrained behavior of internally unstable soils. *Computers and Geotechnics* **126**, 103692, DOI: 10.1016/j.compgeo.2020.103692.

[J23]. Hu, Z.[‡], **Zhang, Y.**[*], Yang, Z.X. (2019) Suffusion-induced evolution of mechanical and microstructural properties of gap-graded soils using CFD-DEM. *Journal of Geotechnical and Geoenvironmental Engineering* **146**(5), 04020024, DOI: 10.1061/(ASCE)GT.1943-5606.0002245.

[J24]. **Zhang, Y.**[*], Zhou, X.[†], Wen, Y.[†] (2019) A constitutive theory for sand based on the concept of critical fabric surface. *Journal of Engineering Mechanics* **146**(4), 04020019, DOI: 10.1061/(ASCE)EM.1943-7889.0001741.

[J25]. Kim, J., **Zhang, Y.**, Seol, Y, Dai, S.[*] (2019) Particle crushing in hydrate-bearing sands. *Geomechanics for Energy and the Environment* **23**, 100133, DOI: 10.1016/j.gete.2019.100133.

[J26]. Hu, Z.[‡], **Zhang, Y.**[*], Yang, Z.X., (2019) Suffusion-induced deformation and microstructural change of granular soils: a coupled CFD-DEM study. *Acta Geotechnica* **14**(3), 795-814, DOI: 10.1007/s11440-019-00789-8.

[J27]. **Zhang, Y.**[*] (2018). Mechanics of adsorption-deformation coupling in porous media. *Journal of the Mechanics and Physics of Solids* **114**, 31-54, DOI: 10.1016/j.jmps.2018.02.009

[J28]. Zhou, X.[†], Ma, G.[§], **Zhang, Y.**[*] (2019). Grain size and time effect on the deformation of rockfill dams: a case study on the Shuibuya CFRD. *Géotechnique* **69**(7), 606-619, DOI: 10.1680/jgeot.17.P.299

[J29]. Ma, G.[§*], Zhou, W., **Zhang, Y.**, Wang, Q., Chang, X. (2017). Fractal behavior and shape characteristics of fragments produced by the impact of quasi-brittle spheres. *Powder Technology* **325**, 498-509, DOI: 10.1016/j.powtec.2017.11.030.

[J30]. Ma, G.[§*], **Zhang, Y.**, Zhou, W., Ng, T.T., Wang, Q., Chen, X. (2017). The effect of different fracture mechanisms on impact fragmentation of brittle heterogeneous solid. *International Journal of Impact Engineering* **113**, 132-143, DOI: 10.1016/j.ijimpeng.2017.11.016.

[J31]. **Zhang, Y.D.**, Buscarnera, G.[*] (2017). Breakage mechanics for granular materials in surface-reactive environments. *Journal of the Mechanics and Physics of Solids* **112**, 89-108, DOI: 10.1016/j.jmps.2017.11.008.

[J32]. Sohn, C., **Zhang, Y.D.**, Cil, M., Buscarnera, G.[*] (2017) Experimental assessment of continuum breakage models accounting for mechanical interactions at particle contacts. *Granular Matter* **19**(4), 67, DOI: 10.1007/s10035-017-0750-5.

[J33]. **Zhang, Y.D.**, Buscarnera, G.* (2017). A rate-dependent breakage model based on the kinetics of crack growth at the grain scale. *Géotechnique* **67**(11), 953-967, DOI: 10.1680/jgeot.16.P.181.

[J34]. Gao, S., **Zhang, Y.D.**, Sonta, A., Buscarnera, G.* (2016). Evolution of water retention characteristics of granular material subjected to grain crushing. *Journal of Geotechnical and Geoenvironmental Engineering* **142** (9), 06016006, DOI: 10.1061/(ASCE)GT.1943-5606.0001505.

[J35]. **Zhang, Y.D.**, Buscarnera, G.*, Einav, I. (2016). Grainsize dependence of yielding in granular soils interpreted using fracture mechanics, breakage mechanics, and Weibull statistics. *Géotechnique* **66**(2), 149-160, DOI: 10.1680/jgeot.15.P.119.

[J36]. **Zhang, Y.D.**, Buscarnera, G.* (2015). Implicit Integration under Mixed Controls of a Breakage Model for Unsaturated Crushable Soils. *International Journal for Numerical and Analytical Methods in Geomechanics* **40** (6). 887-918, DOI: 10.1002/nag.2431.

[J37]. **Zhang, Y.D.**, Buscarnera, G.* (2015). Prediction of breakage-induced couplings in unsaturated granular soils. *Géotechnique* **65**(2), 135-140, DOI: 10.1680/geot.14.P.086.

[J38]. **Zhang, Y.D.**, Buscarnera, G.* (2014). Grainsize dependence of clastic yielding in unsaturated granular soils. *Granular Matter* **16**(4), 469-483, DOI: 10.1007/s10035-014-0491-7.

[J39]. Voyiadjis, G.Z.*, Faghihi, D., **Zhang, Y.D.** (2014). A theory for grain boundaries with strain-gradient plasticity. *International Journal of Solids and Structures* **51**, 1872-1889, DOI: 10.1016/j.ijsolstr.2014.01.020.

Book chapters

[B1]. **Zhang Y.***, Buscarnera G. (2018). *Energetics of Crushable Granular Materials: from Particle Fracture to Breakage Mechanics*. In book: *Energetical Methods in Geomechanics*, ALERT Doctoral School, Aussois, France.

Peer-reviewed conference/ workshop proceedings papers

[C1]. **Zhang, Y.***, Singh, S.†, Wen, Y.† (2024). Breakage and permeability reduction of tailings sand under high-pressure oedometric compression and creep. In *Geo-Congress 2024*, Vancouver, Canada. DOI: 10.1061/9780784485309.033

[C2]. Sisodiya, M.†, **Zhang, Y.*** (2021) A directional micro-crack damage theory for rate-dependent deformation and failure of brittle rocks. In *55th US Rock Mechanics/Geomechanics Symposium,* Houston, TX (Virtual).

[C3]. Zhou, X.†, Liu, S., **Zhang, Y.*** (2021) Predicting permeability change of fractured coals during methane depletion. In *55th US Rock Mechanics/Geomechanics Symposium,* Houston, TX (Virtual).

[C4]. Singh, S.†, Sisodiya, M.†, **Zhang, Y.*** (2020) Interaction between fine-grained bedrock and water during caisson construction and its effect on the axial bearing capacity. In *54th US Rock Mechanics/Geomechanics Symposium,* Golden, CO (Canceled).

[C5]. Sisodiya, M.†, **Zhang, Y.*** (2020) A thermodynamic-consistent micro-crack damage model for brittle rocks. In *54th US Rock Mechanics/Geomechanics Symposium,* Golden, CO.

[C6]. **Zhang, Y.*** (2019). Thermodynamic-consistent adsorption-swelling models for coal. In *53rd US Rock Mechanics/Geomechanics Symposium*, New York City, NY.

[C7]. Zhou, X.†, **Zhang, Y.***, Ma, G.§ (2019). Deformation analysis of the 233 m Shuibuya rockfill dam using breakage mechanics. In *Geo-Congress 2019*, Philadelphia, PA.

[C8]. Zhou, X.†, Ma, G.§, **Zhang, Y.*** (2018). Settlement analysis of the Shuibuya rockfill dam using breakage mechanics. In *52th US Rock Mechanics/Geomechanics Symposium*, Seattle, WA.

[C9]. Hu, Z.[‡], Yang, Z.X., **Zhang, Y.**[*] (2018). Suffusion-induced deformation and microstructural change of granular soils: a CFD-DEM coupling perspective. In *IS-Atlanta 2018*, Geomechanics from Micro to Macro in Research and Practice, Atlanta, GA.

[C10]. **Zhang, Y.D.**[*], Park J.S.[†], Gao S.[**], Sonta A., Horin B., Buscarnera G. (2017) Effect of grain crushing and grain size on the evolution of water retention curves. In *PanAm UNSAT*, Dallas, TX.

[C11]. **Zhang, Y. D.**[*], Buscarnera, G. (2017). Creep of unconsolidated sand due to delayed grain breakage. In *51st US Rock Mechanics/Geomechanics Symposium*, San Francisco, CA

[C12]. Marinelli, F.[*], **Zhang, Y.D.**, Buscarnera, G. (2017) Compaction localization in granular rocks: modeling grain-size effects. In *51th US Rock Mechanics/Geomechanics Symposium*, San Francisco, CA

[C13]. **Zhang, Y. D.**[*], Buscarnera, G. (2015). Constitutive couplings in unsaturated granular media with crushable grains. In *49th US Rock Mechanics/Geomechanics Symposium*, San Francisco, CA.

[C14]. **Zhang, Y. D**.[*], Buscarnera, G. (2014). Model predictions of hydro-mechanical coupling in unsaturated crushable soils. In *Unsaturated Soils: Research & Applications*, CRC Press, 471-477.

Reports and other publications

[R1]. **Zhang, Y.**[*] (2023) Journal Club for August 2023: Attractors in stressed granular materials, *iMechanica*, invited discussion. Website: https://imechanica.org/node/26794.

[R2]. **Zhang, Y.**[*], Newell, P., Xi, Y., Tyrrell, A.[†], Sisodiya, M.[†], Zhou, X.[†], Wang, Y.[††], Wang, Y., Vazic, B. (2022) Time-dependent THMC properties and microstructural evolution of damaged rocks in excavation damage zone. Final technical report submitted to *U.S. Department of Energy – Nuclear Energy University Program*. DOI: 10.2172/1897054.

[R3]. Sisodiya, M.[†], Singh, S.[†], **Zhang, Y.**[*], Pak, R. (2019). Caisson drilling fluid interaction with fine grained bedrock. Technical report submitted to *Colorado Department of Transportation*.

PRESENTATIONS

Invited seminars/ lectures

[1]. Mechanics of Subcritical Crack Growth (SCG) and its implication on the macroscopic response of rock systems, ARMA Future Leader Webinar Series, online event, February 2024.

[2]. Surface Poromechanics approach for modeling solid-environment interaction of porous materials, EMI Poromechanics Seminar, online event, September 2023.

[3]. The hidden role of surface forces in the mechanics of porous and granular materials, *Georgia Institute of Technology*, Atlanta, GA, April 2023.

[4]. The hidden role of surface forces in the mechanics of porous and granular materials, *Colorado School of Mines*, Golden, CO, March 2023.

[5]. A unique critical fabric surface for granular soils pre- and post-liquefaction: DEM evidence and constitutive modelling, *University of California Davis*, Davis, CA, February 2023.

[6]. The hidden role of surface forces in the mechanics of porous and granular materials, *Johns Hopkins University*, Baltimore, MD, November 2022.

[7]. The hidden role of surface forces in the mechanics of porous materials, *Stanford University*, Stanford, CA, November 2022.

[8]. The hidden role of surface forces in the mechanics of porous geomaterials, *Duke University*, Durham, NC, October 2022.

[9]. The hidden role of surface forces in the mechanics of geomaterials, *Northwestern University*, Evanston, IL, February 2022.

[10]. Adsorption-deformation coupling in meso- and microporous geomaterials: theory and applications, *Colorado School of Mines*, Golden, CO, September 2021.

[11]. The hidden role of surface forces in the mechanics of geomaterials, *Lawrence Berkeley National Laboratory*, Berkeley, CA, November 2019.

[12]. Mechanics of adsorption-deformation coupling in porous media, *University of Wyoming*, Laramie, WY, March 2019.

[13]. Energetics of crushable granular materials – from particle fracture to breakage mechanics, *The Alliance of Laboratories in Europe for Education, Research and Technology* (*ALERT) Doctoral School 2018*, Aussois, France, October 2018.

[14]. Application of thermodynamic principles in modeling crushable granular materials under multiphysical loadings, *China University of Petroleum*, Beijing, China, July 2018.

[15]. Application of thermodynamic principles in modeling crushable granular materials under multiphysical loadings, *Cold & Arid Regions Environmental and Engineering Research Institute*, Lanzhou, China, July 2018.

[16]. Time and scaling effect on rockfill dams, *IULEE workshop*, Boulder, CO.

[17]. May 2018, Hydromechanical aspect of grain breakage: testing, modeling, and application, *Stantec*, Denver, CO, May 2018.

[18]. Effect of evolving grain size on the hydromechanical properties of granular soils, *Knight Piésold*, Denver, CO, April 2018.

[19]. Time and scaling effect on rockfill dams: a case study on the Shuibuya CFRD, *U.S. Bureau of Reclamation*, Lakewood, CO, March 2018.

[20]. Modeling breakage of rockfills and its implication on the settlement behavior of large concrete face rockfill dams, *University of Texas at Arlington*, Arlington, TX, November 2017.

[21]. Water-particle interaction and rate effect in crushing of granular materials, *Colorado School of Mines*, Golden, CO, March 2017.

[22]. Effect of water-particle interactions on the crushing of granular materials, *University of Colorado Boulder*, Boulder, CO, March 2016.

[23]. Effect of water-particle interactions on the crushing of granular materials, *Pennsylvania State University*, State College, PA, January 2016.

Conference podium presentations

[1]. Dadras, H.[†] [‡‡], **Zhang, Y.**, Interpreting chemically assisted crack growth in calcite using Surface Force-based Fracture Theory, *EMI 2024*, Chicago, IL, May 2024.

[2]. Behboodi, M.[†] [‡‡], **Zhang, Y.**, An analytical model for hygroscopic bilayers based on surface poromechanics theory, *EMI 2024*, Chicago, IL, May 2024. Behboodi is the winner of the EMI-Poromechanics Student Paper Competition.

[3]. **Zhang, Y.**[‡‡], Behboodi, M.[†], Unified surface poromechanics theory capturing condensation-induced contraction of mesoporous materials, *Interpore 2024*, Qingdao, China, May 2024.

[4]. **Zhang, Y.**[‡‡], Dadras, H.[†], Eskandari-Ghadi, M.[†], Interpreting chemically assisted crack growth through a surface force-based fracture theory, Keynote Lecture, *IAS Symposium on Computational Geomechanics 2024*, Hong Kong, March 2024.

[5]. **Zhang, Y.**[‡‡], Wen, Y.[†], Singh, S.[†], Yu, W. [†], Breakage and permeability reduction of tailings sand under high-pressure oedometric compression and creep, *Geo-Congress 2024*, Vancouver, Canada, February 2024.

[6]. **Zhang, Y.**[‡‡], Behboodi, M.[†] Unified surface poromechanics theory for unsaturated mesoporous materials, *EMI 2023*, Atlanta, GA, June 2023.

[‡‡] Presenter

[7]. Wen, Y.[†] [‡‡], **Zhang, Y.** Fabric evolution of jammed and unjammed granular materials. *EMI 2023*, Atlanta, GA, June 2023.

[8]. **Zhang, Y.**[‡‡], Eskandari-Ghadi, M.[†] On shrinkage-swelling transition of nanoporous materials upon adsorption, *Interpore 2023*, Edinburgh, Scotland, May 2023.

[9]. **Zhang, Y.**[‡‡], Sisodiya, M.[†] Caisson Drilling Fluid Interaction with Fine-Grained Bedrock, *CAGE/ASCE March Lunch Meeting*, Boulder, CO, March 2023.

[10]. **Zhang, Y.**[‡‡], Eskandari-Ghadi, M.[†] A surface-force based fracture theory for subcritical crack growth in brittle materials, *EMI 2022*, Baltimore, MD, June 2022.

[11]. Wen, Y.[†] [‡‡], **Zhang, Y.** Relation between Void Ratio and Contact Fabric of Granular Soils. *EMI 2022*, Baltimore, MD, June 2022.

[12]. **Zhang, Y.**[‡‡], Wen, Y.[†] Unique critical fabric surface for granular soils: DEM evidence and constitutive modelling, *18th European Mechanics of Materials Conference*, Oxford, UK, April 2022.

[13]. Sisodiya, M.[†] [‡‡], **Zhang, Y.** Numerical integration of a novel directional damage model for rate-dependent behavior of brittle rocks. *USNCCM 2021* (virtual), July 2021.

[14]. **Zhang, Y.**[‡‡], Eskandari-Ghadi, M.[†] A multiscale theory explaining the initial shrinkage of microporous materials upon adsorption, *Biot-Bažant conference* (virtual), Evanston, IL, June 2021.

[15]. Sisodiya, M.[†] [‡‡], **Zhang, Y.** A directional micro-crack damage theory for rate-dependent deformation and failure of brittle rocks. *ARMA 2021* (virtual), Houston, TX, June 2021.

[16]. Zhou, X.[†] [‡‡], **Zhang, Y.** Predicting permeability change of fractured coals during methane depletion. *ARMA 2021* (virtual), Houston, TX, June 2021.

[17]. Wen, Y.[†] [‡‡], **Zhang, Y.** Evidence of a unique critical fabric surface for granular soils. *EMI 2021* (virtual), New York, NY, May 2021.

[18]. Eskandari-Ghadi, M.[†] [‡‡], **Zhang, Y.** Initial shrinkage of microporous solid upon gas adsorption. *EMI 2021* (virtual), New York, NY, May 2021.

[19]. **Zhang, Y.**[‡‡] Mechanistic adsorption-swelling models for coal subjected to CO_2 injection, *ARMA 2019*, New York, NY, June 2019.

[20]. **Zhang, Y.**[‡‡], Wen, Y.[†] Critical fabric-based constitutive modeling of granular soils, *EMI 2019*, Pasadena, CA, June 2019.

[21]. Sisodiya, M.[†] [‡‡], **Zhang, Y.**, Liu, S. A microcrack damage model using directional distribution density for anisotropic damage. *EMI 2019*, Pasadena, CA, June 2019.

[22]. **Zhang, Y.**[‡‡], Zhou, X.[†] Deformation analysis of the 233 m Shuibuya rockfill dam using breakage mechanics, *Geo-Congress 2019*, Philadelphia, PA, March 2019.

[23]. Hu, Z.[†] [‡‡], **Zhang, Y.**, Yang, Z.X. Suffusion-induced deformation and microstructural change of granular soils: a CFD-DEM coupling perspective. *IS-Atlanta 2018*, Atlanta, GA, Sept. 2018.

[24]. **Zhang, Y.**[‡‡], Zhou, X.[†] Settlement analysis of the Shuibuya Rockfill dam using breakage mechanics, *ARMA 2018*, Seattle, WA, June 2018.

[25]. **Zhang, Y.**[‡‡] Thermodynamics of adsorption-deformation coupling in porous media, *EMI 2018*, Boston, MA, May 2018

[26]. Park, J.S.[†] [‡‡], **Zhang, Y.** Effect of grain crushing and grain size on the evolution of water retention curves. *PanAM Unsaturated Soils 2017*, Dallas, TX, Nov. 2017.

[27]. **Zhang, Y.**[‡‡] Creep of unconsolidated sand due to delayed grain breakage, *ARMA 2017*, San Francisco, CA, June 2017.

[28]. **Zhang, Y.**[‡‡] Enhanced grain breakage in surface-reactive environments, *EMI 2017*, San Diego, CA, June 2017.

[29]. **Zhang, Y.**‡‡, Buscarnera, G. Grain size effect in the comminution of granular materials, *EMI 2016*, Nashville, TN, May 2016.

[30]. **Zhang, Y.**‡‡, Buscarnera, G. Constitutive couplings in unsaturated granular media with crushable grains, *ARMA 2015*, San Francisco, CA, June 2015.

[31]. **Zhang, Y.**‡‡, Buscarnera, G. Computational aspects of a hydro-mechanical model for crushable granular soils, *USNCTAM 2014*, East Lansing, MI, June 2014.

[32]. **Zhang, Y.**‡‡, Buscarnera, G. Understanding hydro-mechanical coupling in brittle unsaturated granular matter, *EMI 2013*, Evanston, IL, August 2013.

Conference poster presentations

[1]. Monahan, Z.‡‡, Anderson, R., **Zhang, Y.** Pore Pressure as a Driver of Spalling Scale. *AGU 2024*, Washington, D.C., Dec. 2024.

[2]. Monahan, Z.‡‡, Anderson, R., **Zhang, Y.** Modeling Wildfire-Induced Rock Spalling and Associated Rock Surface Evolution. *AGU 2023*, San Francisco, CA, Dec. 2023.

[3]. **Zhang, Y.**‡‡, Xiang, Z.† Permeability evolution of fractured sorptive porous materials. *Interpore 2023*, Edinburgh, Scotland, May 2023.

[4]. Eskandari-Ghadi, M.† ‡‡, **Zhang, Y.** Effect of pore size distribution on sorption-induced deformation of porous materials. *EMI 2021* (virtual), New York, NY, May 2021. Eskandari-Ghadi is the runner-up in the EMI-Poromechanics Student Poster Competition.

[5]. Singh, S.† ‡‡, Sisodiya, M.†, **Zhang, Y.**, Pak, R. Effect of fluid-rock interaction on the strength of Denver claystone. *CAGE University Gala*, Golden, CO, April 2019.

[6]. Sisodiya, M.† ‡‡, **Zhang, Y.** Effect of placement condition on the hydromechanical behavior of overexcavation fills. *CAGE University Gala*, Golden, CO, April 2018.

[7]. Zhou X.† ‡‡, **Zhang, Y.**, Ma, G. The application of breakage mechanics model on Shuibuya Concrete-Face Rockfill Dam, *Rocky Mountain GeoConference 2016*, Golden, CO, Nov. 2016.

PARTICIPATION IN PROFESSIONAL WORKSHOPS

- NSF Workshop: Engineering Mechanics Education (June 2023). Awarded a competitive Travel Grant to participate in the NSF Engineering Mechanics Education workshop. Hosted by Georgia Institute of Technology.
- LEAP Introductory Leadership Workshop (January 2020). Selected to participate in the Introductory Leadership Workshop. Hosted by CUBoulder, Boulder, CO.
- 2nd USUCGER Career Workshop for Junior Geotechnical Faculty (May 2018). Selected to participate in the Career Workshop. Hosted by Case Western Reserve University, Cleveland, OH.

STUDENT/RESEARCH ADVISING

PhD students (as advisor)

- Mohammadali Behboodi, *Multiscale mechanics of adsorption-deformation coupling in soft nanoporous materials*, Aug. 2023 – present.
- Yazeed Kokash, *Thermo-mechanical behavior of plastically bonded granular materials*, July 2022 – present.
- Hooman Dadras, *Subcritical crack growth and macroscopic failure of carbonates in aqueous environments*, May 2022 – present.
- Yuxuan Wen, *Fabric structure of jammed and unjammed granular soils*. Sept.2018 – Dec. 2022.
- Mitul Sisodiya, *Continuum damage mechanics based on directional damage distribution*. Sept. 2017 – Dec. 2021.

- Mehdi Eskandari-Ghadi, *Effect of surface forces on the mechanics of sorption-deformation in microporous media and environment-assisted crack growth in brittle solids*. June 2019 – Dec. 2021.
- Xiang Zhou, *Numerical modeling of granular materials and multiphysical processes in porous Media*. Sept. 2016 – June 2021.

MS students (as advisor)
[1] MS thesis option [2] MS report option

- Wanqi Yu[2], *Behavior of Sand Under Drained Cyclic Loading: Fabric Analysis and Deep Learning Interpretation*. May 2021 – Nov. 2023.
- Andrea Tyrrell[1], *Thermo-mechanical response of Mancos shale*. Jan. 2021 – July. 2022.
- Shubjot Singh[1], *Grain crushing and permeability reduction for tailing underflow materials*. Sept. 2018 – Aug. 2020.
- Nishanthi Perera[2], *Infiltration Design: SR 90 Phase 3 Dispersion Areas Project*, Jan. 2019 – Dec. 2019.
- Haonan Xu[2], *Capacity reduction of drilled caissons due to water infiltration in claystone bedrocks*, Sept. 2018 – Aug. 2019.
- Joon Soo Park[1], *Experimental investigation on grain crushing under isotropic conditions*, Sept. 2016 – May 2018.
- Andrew Joseph Philpott[2], *A Novel Soil Column Apparatus for Studying Unsaturated Flow During Gas Burst*. Sept. 2016 – May 2018.
- Rebecca Scheetz[1], *Numerical Simulations of Two-Phase Flow in Rigid Porous Media*, Jan. 2017 – July 2017.

Post-Doctoral researchers
- Mehdi Eskandari-Ghadi, Jan. 2022 – Dec. 2022.
- Yao Wang, Jan. 2020 – Sept. 2021.
- Mohamed Ab Abdelrahman, July. 2019 – Jan. 2020.

Undergraduate students
- Cesar Lopez, Coe College, May 2024 – Aug. 2024.
- Tao Wang, CUBoulder, Jan. 2018 – May 2018.
- Trinity Payne, CUBoulder, Jan. 2019 – May 2019.
- Noah Traynor, CUBoulder, Jan. 2019 – May 2019.

Visiting PhD students and research scholars
- Zheng Hu, visiting PhD student, Zhejiang University. *Numerical study of soil erosion using the coupled CFD-DEM technique*. Aug. 2017 – Aug. 2018.
- Dayan Wang, visiting scholar, Cold & Arid Regions Environmental and Engineering Research Institute. *Experimental characterization of water migration during soil freezing*. Aug. 2017 – Aug. 2020.

INSTITUTIONAL AND SCHOLARLY SERVICE

CUBoulder Department of Civil, Environmental, and Architectural Engineering
- Committee Member:
  - Search Committee for a new CEAE teaching faculty (1/25 – present)
  - Curriculum Committee (9/20 – present)
  - Graduate Committee (9/17 – 9/20)

- Justice, Equity, Diversity, and Inclusion (JEDI) Committee (2/21 – 5/22)
- Search Committee for the GEGM tenure-track faculty (8/18 – 4/19)
- GEGM Joint Evaluation Committee (JEC) (9/16 – 6/17)
- Search Committee for the structural and geotechnical lab manager (4/17)

- Lab and facilities:
  - Coordinator of the undergraduate and graduate Geotechnical laboratories (12/18 – present)
  - Leader of the High-Pressure Thermal Triaxial MTS device upgrading project. Phase I: controller development and basic triaxial testing functionality (10/17 – 12/20). Phase II: controller upgrade and advanced thermal triaxial functionality (02/22 – present)
- Exam and reviews:
  - Fundamentals in Engineering (FE) Exam review (10/16, 10/17, 9/18, 9/19, 9/20, 9/21, 9/22, 9/23, 9/24)
  - GEGM PhD preliminary exam (5/17, 12/17, 5/18, 5/19, 5/20, 5/21, 5/23, 5/24)
  - GEGM MS final exam (5/17, 5/19, 5/20, 5/21)
- Event organization:
  - Geotechnical Engineering and Geomechanics seminar series (lead 1/19 – 3/20, co-organize 9/21 – present)
  - Jack Hilf Lecture (lead 10/17, co-organize 10/18, co-organize 10/23, lead 4/25)
- Faculty advisor:
  - Engineering Excellence Fund at CUBoulder (9/20 – present)
  - ASCE Geo-Institute Student Chapter (9/20 – present)

Scholarly organizations

- Professional Committees
  - *Poromechanics* committee of the Engineering Mechanics Institute (EMI) of the American Society of Civil Engineers (ASCE): Chair (08/23-present); Vice Chair (12/21 – 08/23); Member (05/21 – present)
  - *Granular materials* committee of the EMI of ASCE: Member (06/17 – present)
  - *Modeling Inelasticity and Multiscale Behavior* of the EMI of ASCE: Member (5/18 – present)
  - *Unsaturated Soils* committee of the Geo-Institute of ASCE: Member (09/16 – present)
  - *Underground Storage and Utilization* committee of ARMA: Member (07/20 – Present)
- Ad Hoc Committees
  - *Early Career Keynote Lecture* selection committee for ARMA 2024 conference: Chair (09/23 – 07/24)
- Journal Editorial Board
  - *Géotechnique Letters* (09/18 – present)
- Conference Mini Symposium Chair
  - *Swelling and shrinking porous media*, with Yihuai Zhang, Muhammad Arif, Jean-François Louf, InterPore 2025, Albuquerque, New Mexico, USA, May 2025.
  - *Swelling and shrinking porous media*, with Yihuai Zhang, Muhammad Arif, Jean-François Louf, and Yang Yang, InterPore 2024, Qingdao, China, May 2024.
  - *Numerical Modelling in Geomechanics: Civil Engineering Applications*, with Bin Gong, ARMA 2024, Golden, CO, July 2024.

- *Mechanics and Physics of Granular Materials*, with Payam Poorsholhjouy and Marcial Gonzalez, EMI 2023, Atlanta, GA, June 2023.
- *Swelling and shrinking porous media*, with Daniel Markle, Chris MacMinn, Sridhar Ranganathan, and Yihuai Zhang, InterPore 2023, Edinburgh, Scotland, May 2023.
- *Experiment, modelling, and machine Learning applications in geomechanics*, with Gabriel Walton, ARMA 2021, Houston, TX, June 2021 (virtual).
- *Numerical Modeling in Rock Mechanics focused on Civil Engineering Projects*, with Xiaoyu Song, ARMA 2020, Golden, CO, June 2020 (virtual).
- *Multiscale geomechanics*, with Jesse Hampton, ARMA 2019, New York, NY, June 2019.
- *Numerical Modeling of Civil Rock Engineering Projects*, with Seunghee Kim, ARMA 2018, Seattle, WA, June 2018.

- Conference Track Lead
  - *Interdisciplinary Track*, ARMA 2021, Houston, TX. June 2021 (virtual).
  - *Special Topics*, with Michelle Lee Barry and Marco Salviato, EMI 2019, Pasadena, CA, June 2019.
- Proposal review and panels
  - *National Science Foundation (NSF) - Engineering for Civil Infrastructure*, *NSF- Geotechnical Engineering and Materials*, *NSF- Fluid Dynamics*, *NSF - Geophysics*, *NSF - Particulate & Multiphase Process, NSF - Major Research Instrumentation*, *U.S. Department of Energy (DOE)- Basic Energy Sciences (BES) - Geosciences Program, DOE-Nuclear Energy University Program (NEUP), DOE- Energy Frontier Research Centers (EFRC), DOE-Early Career Research Program, American Chemical Society (ACS)-Petroleum Research Fund (PRF), Hong Kong Research Grants Council (RGC)*.
- Journal article review

  Journal of Mechanics and Physics of Solids, *Journal of Engineering Mechanics*, *Journal of Geophysical Research: Solid Earth*, *Geophysical Research Letters*, *Fuel*, *Géotechnique*, *Journal of Geotechnical and Geoenvironmental Engineering, International Journal of Rock Mechanics and Mining Sciences, International Journal for Numerical and Analytical Methods in Geomechanics, Rock Mechanics and Rock Engineering*, *Engineering Fracture Mechanics, Computers and Geotechnics*, *Granular Matter*, *Journal of Infrastructure Systems, Geotechnical Testing Journal*, *International Journal of Damage Mechanics, Engineering Geology*, *Geomechanics for Energy and the Environment*, *Mechanics Research Communications*, *Journal of Rock Mechanics and Geotechnical Engineering, Open Geomechanics, Chemical Engineering Journal, The Journal of Supercritical Fluids, Underground Space*.
- Membership

  ASCE Geo-Institute (GI), ASCE Engineering Mechanics Institute (EMI), American Rock Mechanics Association (ARMA)