

Exponent®
Engineering & Scientific Consulting

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Professional Profile

Dr. Salam specializes in computational geomechanics, numerical and analytical analysis of geosystems, and condition assessment of geotechnical assets. His expertise encompasses natural and man-made slopes, embankments, retaining structures, roads and highways, ground improvement, and earth dams. Dr. Salam is adept at providing both reactive and proactive consultation, alongside risk assessment for geotechnical assets. Dr. Salam leverages his multidisciplinary background in engineering and statistics to deliver innovative solutions for civil and geotechnical engineering applications.

Dr. Salam possesses extensive experience in the evaluation of sustainability and serviceability of geo-structures under operational loads and due to natural hazards, including earthquakes, storms, and wildfires. He is experienced with design and construction of earth dams, for which he has performed static and seismic stability analyses, seepage analysis and drainage design. Employing data-driven methodologies, Dr. Salam has navigated complex challenges through both numerical and experimental approaches to evaluate the liquefaction and flow failure potential of tailings dams, leveraging data from comprehensive laboratory and field investigations.

He has conducted subsurface explorations and material characterization through interpretation of in-situ and laboratory data. He has inspected and provided engineering consultation on shallow and deep foundations as well as ground improvement techniques. Dr. Salam has experience in analyzing different mechanisms of soil movement including bearing failure, consolidation settlement, expansion, and collapse of soils. He is experienced in the evaluation of rigid inclusions to enhance the engineering characteristics of weak soils, such as Peats and Soft Clays.

He is skilled in performing slope stability analysis and has evaluated landslides and debris flows in diverse environments. He has studied and provided slope stabilization measures and mitigation alternatives. Dr. Salam has evaluated the design, construction, and performance of retaining structures such as modular walls, mechanically stabilized earth (MSE) walls, and shoring walls used for excavation support. Dr. Salam has investigated the advancement and stability of underground mines, mine subsidence, and ground collapse (often referred to as “sinkholes”). He has made observations and assessment of underground utility lines and determined cause and origin of failures. Dr. Salam has been involved with reviewing design, development, and construction of several windfarms. He has also evaluated the adequacy of foundations of wind turbines and roadways in the windfarms. Dr. Salam has led and contributed to statewide projects focused on enhancing sustainability and safety for utility company assets. As a project manager, he has effectively coordinated efforts across multiple teams to achieve project goals within set budgets and timelines.

Dr. Salam has conducted in-depth research on numerous aspects related to the design and sustainability of infrastructural systems. He has experience with advanced laboratory testing and physical modeling of geotechnical materials. Dr. Salam’s research has explored the impact of soil index properties on the strength of unbound aggregates, emphasizing the selection of high-quality aggregates for roadway

applications. Furthermore, his investigations into the stability of slurry backfilled underground mines have shed light on how geometry specifications influence stability within the Illinois Basin context. Dr. Salam's doctoral research offered insights into the cyclic behavior of tailings and the stability of tailings dams during, and following, extreme events like earthquakes and blasts. His work included shake table testing to examine tailings' cyclic behavior under a sequence of shaking events, alongside adoption of advanced and innovative numerical modeling tools. Dr. Salam studies and research included a minor in statistics and use of statistical methods to assess failure probability and improve the reliability of outcomes. Dr. Salam has taught several undergraduate and graduate courses on the topics of Soils in Construction and Engineering Materials Laboratory.

Academic Credentials & Professional Honors

M.S., Data Science, University of Texas, Austin, 2024

Ph.D., Civil Engineering, Penn State University, 2020

M.S., Civil Engineering, Southern Illinois University, 2017

B.S., Civil Engineering, Sharif University of Technology, Iran, 2014

2020: Harry G. Miller Fellowship in college of engineering, University Park, PA.

2019: International Association of Foundation Drilling (ADSC) Endowed Civil Engineering Award

2019-2020: Itasca Education Partnership (IEP)

2018-2019: CEE Mark E. and Claire L. Alpert Fellowship in Civil Engineering, University Park, PA.

2018-2019: Leo P. Russell Graduate Fellowship in Civil Engineering, University Park, PA.

2017-2018: The Pennsylvania State University Distinguished Graduate Fellowship, University Park, PA.

2016: Outstanding Civil Engineering Graduate Student, Southern Illinois University Edwardsville, IL.

Licenses and Certifications

Professional Engineer Civil, California, #94829

Professional Engineer Civil, Illinois, #062.089086

Professional Engineer Civil, Texas, #137804

Academic Appointments

Adjunct Faculty, Construction, SIUE, 2017

Instructor, Civil Engineering, PSU, 2018

Prior Experience

Geotechnical Engineer, Marino Engineering Associates, Inc. (MEA), 2016-2017

Staff Engineer, Mahab Ghodss Consulting Co., 2011-2013

Professional Affiliations

American Society of Civil Engineers (ASCE)

Geo-Institute of ASCE (GI)

Deep Foundation Institute (DFI)

Languages

English

Persian

Publications

Namjoo, A. M., Baniasadi, M., Jafari, K., Salam, S., Toufigh, M. M., & Toufigh, V. (2022). Studying effects of interface surface roughness, mean particle size, and particle shape on the shear behavior of sand-coated CFRP interface. Transportation Geotechnics, 37, 100841.

Ismail, H., Xiao, M., Salam, S., Scholl, B., & Liu, X. (2021). Infill Mobility through Engineered Synthetic Turf on Steep Slopes. Journal of Hydraulic Engineering, 147(8), 04021023.

Salam, S., Xiao, M., Khosravifar, A., Ziotopoulou, K., (2021). "Seismic Stability of Coal Tailings Dams with Spatially Variable and Liquefiable Coal Tailings Using Pore Pressure Plasticity Models." Computers and Geotechnics, Volume 132.

Salam, S., Xiao, M., Evans, J., (2020). “Strain History and Aging Effects on the Strength and Cyclic Response of Fine-Grained Coal Refuse.” Journal of Geotechnical and Geoenvironmental Engineering, https://doi.org/10.1061/(ASCE)GT.1943-5606.0002364.

Wang, J., Salam, S., Xiao, (2020). “Evaluation the Effect of Shaking History on Liquefaction and Cone Penetration Resistance Using Shake Table Tests.” Soil Dynamics and Earthquake Engineering. https://doi.org/10.1016/j.soildyn.2019.106025.

Salam, S., Xiao, M., Khosravifar, A., Liew, M., Liu, S., Rostami, J. (2019). “Characterizations of Static and Dynamic Geotechnical Properties and Behaviors of Fine Coal Refuse.” Canadian Geotechnical Journal. https://doi.org/10.1139/cgj-2018-0630.

Wang, J., Xiao, M., Evans, J.C., Qiu, T., Salam, S. (2019). “Time-Dependent Cone Penetration Resistance of a Post-Liquefaction Sand Deposit at Shallow Depth.” Journal of Geotechnical and Geoenvironmental Engineering, 145(6), 04019021-1 to 04019021-12. DOI: https://doi.org/10.1061/(ASCE)GT.1943-5606.0002049.

Salam, S., Osouli, A., Tutumluer, E. (2018). “Crushed Limestone Aggregate Strength Influenced by Gradation, Fines Content, and Dust Ratio.” Journal of Transportation Engineering, Part B: Pavements, ASCE, 144(1), 04018002. DOI: https://doi.org/10.1061/JPEODX.0000032.

Osouli, A., Salam, S., Tutumluer, E., Beshears, S. (2017). “Fines Inclusion in Crushed Limestone Unbound Aggregates with 25.4 mm (1 in) Maximum Particle Size.” Transportation Geotechnics, 10, 96-108. DOI: https://doi.org/10.1016/j.trgeo.2017.02.001.

Osouli, A., Salam, S., Othmanawny, G., Tutumluer, E., Beshears, S., Shoup, H., Eck, M. (2017). “Results of Soaked and Unsoaked CBR Tests on Unbound Aggregates with Varying Amounts of Fines Content and Dust Ratio.” Transportation Research Record: Journal of the Transportation Research Board, (2655),

13-19. DOI: https://doi.org/10.3141%2F2655-02.

Chaulagai, R., Osouli, A., Salam, S., Tutumluer, E., Beshears, S., Shoup, H., Bay, M. (2017). “Influence of Maximum Particle Size, Fines Content, and Dust Ratio on the Behavior of Base and Subbase Coarse Aggregates.” Transportation Research Record: Journal of the Transportation Research Board, (2655), 20-26. DOI: https://doi.org/10.3141%2F2655-04.

Osouli, A., Salam, S., Tutumluer, E. (2016). “Effect of Plasticity Index and Dust ratio on Moisture-Density and Strength Characteristics of Aggregates.” Transportation Geotechnics, 9, 69-79. DOI: https://doi.org/10.1016/j.trgeo.2016.07.005.

Khosravi, A., Salam, S., McCartney, J. S. Dadashi, A. (2015). “Suction-induced Hardening Effects on The Shear Modulus of Unsaturated Silt.” International Journal of Geomechanics, ASCE, 16(6), D4016007. DOI: https://doi.org/10.1061/(ASCE)GM.1943-5622.0000614.

Salam, S., Xiao, M., Wang, J. (2020). “Physical Modeling of Fine Coal Refuse Using Shake Table Testing.” GeoCongress 2020, Geotechnical Special Publication, (GSP 318), 114-122. DOI: https://doi.org/10.1061/9780784482810.013.

Salam, S., Xiao, M., Khosravifar, A., Wang, J. (2019). “Cyclic Behavior and Liquefaction Resistance of Fine Coal Refuse – Experimental and Numerical Modeling.” GeoCongress 2019, Geotechnical Special Publication, (GSP 308), 229-238. DOI: https://doi.org/10.1061/9780784482100.024.

Wang, J., Salam, S., Xiao, M. (2019). “The Effect of Shaking History on Liquefaction Resistance of Sand Deposit Using Shake Table Testing.” GeoCongress 2019, Geotechnical Special Publication, (GSP 308), 285-293. DOI: https://doi.org/10.1061/9780784482100.029.

Osouli, A., Salam, S., Flynn, S. (2016). “Effect of Dust Ratios on the Strength of Aggregates with Low Plasticity Fines.” In Geo-Chicago, Chicago, IL, pp. 253-265. DOI: https://doi.org/10.1061/9780784480151.026.

Zamiran, S., Salam, S., Osouli, A., Ostadhassan, M. (2015). “Floor and Pillar Stability Considerations for Underground Disposal of Fine Coal Waste.” In 49th US American Rock Mechanics Association (ARMA) Geomechanics Symposium, San Francisco, CA.

Presentations

1. ASCE G-I Meeting, Illinois Section. Presentation title: "Case History of Collapsible Soils in Coastal Venezuela." (2021)

2. 3rd Earthquake Engineering and Soil Dynamic (EESD) G-I Web-Conference. Presentation title: “Strain History and Short-Period Aging Effects on the Strength and Liquefaction Behavior of Fine-Grained Coal Refuse.” (2019)

3. Eighth International Conference on Case Histories in Geotechnical Engineering, GeoCongress 2019, Philadelphia, PA. Presentation title: “Cyclic Behavior and Liquefaction Resistance of Fine Coal Refuse – Experimental and Numerical Modeling.” (2019)

4. 95th Annual Meeting, Transportation Research Board (TRB), Washington, D.C. Presentation title: “Effect of Plasticity Index and Dust ratio on Moisture-Density and Strength Characteristics of Aggregates.” (2016)

5. ASCE G-I Case History Night, St. Louis, MO. Presentation title: “Improvement of Specifications Regarding Unbound Aggregate Used in Base and Subbase Construction.” (2016)

6. 49th US American Rock Mechanics Association (ARMA) Symposium, San Francisco, CA. Presentation title: “Floor and Pillar Stability Considerations for Underground Disposal of Fine Coal Waste.” (2015)

Advisory Appointments

Vice President of Geo-Institute SIUE Chapter, 2015- 2016

Peer Reviews

ASCE Journal of Geotechnical and Geoenvironmental Engineering

Computers and Geotechnics

Acta Geotechnica

ASTM Journal of Testing and Evaluation

International Journal of Pavement Engineering

Road Materials and Pavement Design Journal

ASCE Journal of Cold Regions Engineering

European Journal of Environmental and Civil Engineering

Transportation Research Board (TRB)

Transportation Geotechnics Journal