Xiaole Han | Postdoctoral Researcher

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Education

2017 - 2022	Ph.D.	Geotechnical Engineering	University of Hawaii at Manoa, US (Supervisor: Ningjun Jiang)
2014 - 2017	M.S.	Mining Engineering	China University of Mining and Technology, China (Supervisor: Jixiong Zhang)
2013 - 2014	Exchange student	Geology	North Dakota State University, US (Supervisor: Allan Ashworth)
2010 - 2013	B.S.	Mining Engineering	China University of Mining and Technology, China

Projects

(1) Coastal dune erosion mitigation through bio-mediated geotechnical approach (experimental parts). University of Hawaii at Manoa (2020.05-2020.08)

(2) Sustainable low viscosity cement grouts for permeation grouting in erodible calcareous and coral sands (experimental parts). Hawaii DOT (2020.01-2022.12)

(3) Indo-US Joint Center of Development of Sustainable Materials for Soil Remediation (experimental parts). IUSSTF (2019.05-2021.05)

Experimental Research & Internship

2022 – Now — Postdoctoral Researcher — University of Hawaii at Manoa, US

- Utilizing Alkali-Activated Concrete migitate heavy metal ions in soil
- Developing Alkali-Activated Concrete mix with machine leanring algorithms

2017 – 2022 — Ph.D. — University of Hawaii at Manoa, US

- Preparing technical reports/publications/presentations
- Conducting geotechnical experiments on calcareous sand stabilization with AAS and biochar
- 3D modeling using SfM (Structure from Motion) technique on structure health monitoring
- Deploying deep learning algorithms in geotechnical and environmental related fields

2014 – 2017 — Master — China University of Mining and Technology, China

- Designing coal mine roadway support system for backfill mining working face
- DEM modeling to simulate gangue backfill mining technology in coal mine
- Conducting in-situ coal mine roof subsidence data collection and analysis
- Conducting laboratory rock sample strength experiments and physical scaled model test

Themed Conference

Oral presentation

2021 1st IACM Conference on Machine Learning and Digital Twins for Computational Science and Engineering San Diego, USA

2020 3rd International Symposium on Coupled Phenomena in Environmental Geotechnics, Kyoto, Japan

2018 B2G-Atlanta 2018, Atlanta, USA

Poster presentation

2022 20th International Conference on Soil Mechanics and Geotechnical Engineering, Sydney, Australia

2020 Geo-congress 2020, Minneapolis, USA

2019 Engineering Mechanics Institute Conference, California, USA

Teaching Experience

- Lecturer for undergraduate courses

  2020 Spring — CEE270-Applied Mechanics I

- Teaching assistant for undergraduate courses

  2017 Fall, 2018 Fall, 2019 Spring and 2019 Fall CEE355-Geotechnical Engineering (I)

Publications

Journal papers

[1]. **Han, X.-L**., Jiang, N.-J., Hata, T., Choi, J., Du, Y.-J., & Wang, Y.-J., (2023). Deep learning based approach for automated characterization of large marine microplastic particles. Marine Environmental Research. 105829. https://doi:10.1016/j.marenvres.2022.105829

[2]. **Han, X. L.**, Jiang, N.J., Jin, F., Reddy, K. R., Wang, Y.J., Liu, K.W, & Du, Y.J. (2022). Effects of biochar-amended alkali-activated slag on the stabilization of coral sand in coastal areas. Journal of Rock Mechanics and Geotechnical Engineering. https://doi.org/10.1016/j.jrmge.2022.04.010

[3]. **Han, X. L.**, Jiang, N. J., Yang, Y. F., Choi, J., Singh, D. N., Beta, P., ... & Wang, Y. J. (2022). Deep learning based approach for the instance segmentation of clayey soil desiccation cracks. Computers and Geotechnics, 146, 104733. https://doi.org/10.1016/j.compgeo.2022.104733

[4]. **Han, X.L.,** Jiang, N.J., Zhan, W.G., Zhou, M. L. (2022) Visualization and Characterization of Clay Soil Desiccation Crack Using Deep Learning and Structure from Motion Methods. Journal of Earth Science (Under Review)

[5]. Wang, Y. J., **Han, X. L.** (Co-first authors), Jiang, N. J., Wang, J., & Feng, J. (2020). The effect of enrichment media on the stimulation of native ureolytic bacteria in calcareous sand. International Journal of Environmental Science and Technology, 17(3), 1795-1808. https://doi.org/10.1007/s13762-019-02541-x

[6]. Zhou, N., **Han, X. L.**, Zhang, J. X., & Li, M. (2016). Compressive deformation and energy dissipation of crushed coal gangue. Powder Technology, 297, 220-228. https://doi.org/10.1016/j.powtec.2016.04.026

[7]. Tai, Y., Ju, F., & **Han, X. L*** (Corresponding author). (2019). Investigation of the kinetic energy transformation pattern of gangue particles in a buffer system. Powder Technology, 344, 926-936. https://doi.org/10.1016/j.powtec.2018.12.077

[8]. Wang, Y. J., Jiang, N. J., **Han, X. L.**, Liu, K., & Du, Y. J. (2022). Biochemical, strength and erosional characteristics of coral sand treated by bio-stimulated microbial induced calcite precipitation. Acta Geotechnica, 1-13. https://doi.org/10.1007/s11440-022-01491-y

[9]. Zhang, Q., Zhang, J. X., **Han, X. L.**, Ju, F., Tai, Y., & Li, M. (2016). Theoretical research on mass ratio in solid backfill coal mining. Environmental Earth Sciences, 75(7), 1-11. https://doi.org/10.1007/s12665-015-5234-5

Conference papers

[10]. **Han, X. L.**, Jiang, N. J., & Wang, Y. J. (2021). A laboratory investigation of coastal sand stabilization using biochar-enhanced alkali-activated slag. Japanese Geotechnical Society Special Publication, 9(6), (pp. 292-295).

[11]. **Han, X. L.**, Jiang, N. J., & Wang, Y. J. (2020, February). Stabilization of calcareous sand by applying the admixture of alkali-activated slag (AAS) and biochar. In Geo-Congress 2020: Foundations, Soil Improvement, and Erosion (pp. 469-475). Reston, VA: American Society of Civil Engineers.

[12]. Jiang, Ning-Jun, **Han, Xiaole**, Wang, Yijie & Du, Yan. (2022). Shear strength behavior of bio-cemented carbonate sand treated by biochar- enhanced bio-stimulation approach.

[13]. Wang, Y. J., **Han, X. L.**, & Jiang, N. J. (2018). Enriching indigenous ureolytic bacteria in coastal beach sand. In the international congress on environmental geotechnics (pp. 340-347). Springer, Singapore.

[14]. Wang, Y. J., **Han, X. L.**, and Jiang, N. J. (2018). A preliminary study on the enrichment of indigenous ureolytic and nitrifying bacteria in beach sand: implication for coastal erosion control. In Proceedings of B2G symposium, Atlanta, USA.

Patterns

[15]. Zhang, J. X., **Han, X. L.**, Zhang, Q., Lan, L. X., Chen, Y., & Tai, Y. (2020). Method for determining physical similarity simulation material of solid backfill body. Patent No. US10697873B2. Washington, DC: U.S. Patent and Trademark Office.

[16]. Zhang, J. X., Zhang, Q., Mei, M. C., Fang, K., & **Han. X. L**. (2020). Method for recovering room-mining coal pillars by

solid filling in synergy with artificial pillars. Patent No. US10612378B2. Washington, DC: U.S. Patent and Trademark Office.

[17]. Zhang, J. X., Fang, K., An, B. F., **Han, X. L.**, Yan, H., & Quan, K. (2018). Consolidated solid strip backfill mining method for coal mine. Patent No. WO2018045633.

[18]. Zhang, J. X., **Han, X. L.**, Fang, K., Zhang, Q., Chen, Y. D., & Zhong, S. J. (2017). A method for determining the size and spacing of artificial pillars for recycling room pillars in coal mine. Patent No. CN201710161348.2. Beijing, China National Intellectual Property Administration.

Awards & Scholarships

2018 E.E. Black Scholarship in Civil and Environmental Department, University of Hawaii at Manoa, US

2016 Scholarship of Merits Graduate in China University of Mining and Technology (Grade 1), China

2013 Excellent Student Cadre in Jiangsu Province, China

2013 Meritorious Prize of the 2013 Interdisciplinary Contest in Modeling (ICM), COMAP Ranking 95/957, US

2013 Global Undergraduate Exchange Program Scholarship, U.S. Department of the State, US

2012 Scholarship of Merits Undergraduate in China University of Mining and Technology (Grade 2), China

2012 Second Prize of the 2011 China Society of Electronic Engineering Math Modeling Competition, China

Service & Activities

Journal Reviewer

Soils and Foundations

International Journal of Geosynthetics and Ground Engineering

Energy Science & Engineering

The Journal of Geophysics and Engineering