Hua Yu

PhD, PE, CEng, CEnv, CSci, EUR ING, IntPE(NZ), APEC Engineer, LEED Green Associate, ENV SP, MASCE, MIMMM, CMEngNZ

Assistant Professor

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EDUCATION

- PhD, Civil Engineering, University of Wyoming, 2018
  - Dissertation Title: "Geomechanical Characterization of CO_2 Storage Reservoirs on the Rock Springs Uplift, WY"
  - Advisor: Dr. Kam Ng
- MS, Geological Engineering, University of Wisconsin-Madison, 2014
  - Thesis Title: "Beneficial Use of Dredged Materials in Great Lakes Commercial Ports for Transportation Projects"
  - Advisor: Dr. William J. Likos
- BE, Geological Engineering, Hunan University of Science and Technology, 2011

LICENSES & CERTIFICATIONS

- International Professional Engineer (IntPE)/APEC Engineer, Engineering New Zealand & International Engineering Alliance, New Zealand, 2024 – Present
- European Engineer (EUR ING), Engineers Europe, Registration No. 37011, 2023 – Present
- Chartered Engineer (CEng), Engineering Council, United Kingdom, 2022 – Present
- Chartered Environmentalist (CEnv), Society for the Environment, United Kingdom, 2022 – Present
- Chartered Scientist (CSci), Science Council, United Kingdom, 2022 – Present
- Professional Engineer (PE), Civil: Geotechnical, State of Wyoming, United States, 2022 – Present
- LEED Green Associate, U.S. Green Building Council/Green Business Certification Inc., 2022 – Present
- Envision Sustainability Professional (ENV SP), Institute for Sustainable Infrastructure, 2022 – Present

APPOINTMENTS

- Assistant Professor (Tenure Track), University of Texas at Tyler, January 2025 – Present
- Post-Doctoral Research Associate, University of Wyoming, December 2021 – October 2024
- Research Fellow, Nanyang Technological University, June 2018 – December 2021

- Graduate Research Assistant, University of Wyoming, January 2015 – May 2018
- Graduate Research Assistant, University of Wisconsin-Madison, June 2013 – December 2014

HONORS & AWARDS

- Fellow, ASCE ExCEEd Teaching Workshop, 2025
- Outstanding Reviewer, ASCE Journal of Cold Regions Engineering, 2023
- Selected Viewer, 10th Anniversary Edition of the Global Young Scientists Summit (GYSS), National Research Foundation Singapore, 2022

RESEARCH INTERESTS

- Biocementation for Soil Improvement
- Carbon Capture, Utilization, and Storage
- Cementitious Materials and Concrete
- Coal-Derived Carbon Materials
- Environmental Sustainability
- Frozen Soils and Cold Regions Engineering
- Geologic Carbon Sequestration
- Industrial Byproducts and Waste Utilization
- Rock and Soil Mechanics
- Soil Stabilization and Soft Ground Improvement

TEACHING

- University of Texas at Tyler, 2025 – Present
    - Courses:
        CENG 4381/5381 Foundation Design, Enrollment = 13, Fall 2025
        CENG 3336/L Soil Mechanics and Foundation Design (with Lab), Enrollment = 24, Spring 2025
        CMGT 3320/L Soils and Foundations in Construction (with Lab), Enrollment = 36, Spring 2025

PEER-REVIEWED JOURNAL ARTICLES

29. Dipta, I. A., Ng, K., Chadwick, J. C., Lau, C., **Yu, H.**, & Johnson, P. (2025). Effect of coal-derived graphene oxide on mechanical and microstructural characteristics of concrete. *Materials*, *18*(12), 2774.
28. **Yu, H.**, Kharel, S., Lau, C., & Ng, K. (2025). Durability of water-based silane/siloxane treated coal char brick subjected to weatherometer exposure. *Construction and Building Materials*, *473*, 141028.
27. **Yu, H.**, Kharel, S., Lau, C., & Ng, K. (2025). Effect of carbonation with different CO_2 phases on early-age properties of coal char-cement mixture. *Journal of Building Engineering*, *103*, 112215.
26. Dipta, I. A., Ng, K., Lau, C., & **Yu, H.** (2025). Evaluating the use of coal-derived char for improving mechanical performance and microstructural characteristics of concrete. *Journal of Sustainable Cement-Based Materials*, *14*(4), 780-798.

25. Joshi, P., **Yu, H.**, Lau, C., & Ng, K. (2025). Impacts of coal char content and curing temperature on properties of cement-stabilized soil for transportation applications. *Transportation Infrastructure Geotechnology*, *12*, 59.
24. Kharel, S., **Yu, H.**, Lau, C., & Ng, K. (2024). Coal-derived char as new sand replacement material in cement mortars: A comprehensive experimental study. *Science of the Total Environment*, *954*, 176472.
23. **Yu, H.**, Jonchhe, P., Lau, C., & Ng, K. (2024). Heat of hydration of Portland cement containing coal-derived char at different temperatures. *Results in Materials*, *23*, 100595.
22. Jonchhe, P., **Yu, H.**, Lau, C., & Ng, K. (2024). A comprehensive investigation of new coal char-based cement grouts: Impact of curing temperature, environment, and duration. *Transportation Infrastructure Geotechnology*, *11*, 3469-3495.
21. **Yu, H.**, Jonchhe, P., Lau, C., & Ng, K. (2024). Influence of coal char addition on the heat of hydration and rheological behavior of cement grout. *ASCE Journal of Materials in Civil Engineering*, *36*(8), 04024231.
20. **Yu, H.**, Joshi, P., Lau, C., & Ng, K. (2024). Coal-derived char for durability improvement of cement stabilized soil under freeze-thaw, wet-dry, and sulfate attack. *Canadian Geotechnical Journal*, *62*, 1-20.
19. Pandey, S. P., **Yu, H.**, Lau, C., & Ng, K. (2024). New and sustainable coal char-based paving blocks for roadway applications. *Buildings*, *14*(5), 1275.
18. Pandey, S. P., **Yu, H.**, Lau, C., & Ng, K. (2024). New coal char-based building products: Manufacturing, engineering performance, and techno-economic analysis for the USA market. *Sustainability*, *16*(5), 1854.
17. **Yu, H.**, Joshi, P., Lau, C., & Ng, K. (2024). Novel application of sustainable coal-derived char in cement soil stabilization. *Construction and Building Materials*, *414*, 134960.
16. Hossain, M. T., Lau, C., **Yu, H.**, & Ng, K. (2024). Characterization of coal extracts and their performances as binder for new carbon-based structural units. *Construction and Building Materials*, *412*, 134820.
15. **Yu, H.**, Jonchhe, P., Lau, C., & Ng, K. (2023). Temperature effect on density, strength, and microstructure of sustainable coal char-cement grout. *Journal of Building Engineering*, *80*, 107975.
14. **Yu, H.**, Ng, K., & Lau, C. (2023). New coal char-based bricks: Effects of curing temperature, humidity, pressing pressure, and addition of superplasticizer on the physical, mechanical, and thermal properties. *Case Studies in Construction Materials*, *19*, e02529.
13. **Yu, H.**, Kharel, S., Lau, C., & Ng, K. (2023). Development of high-strength and durable coal char-based building bricks. *Journal of Building Engineering*, *74*, 106908.
12. **Yu, H.**, Jonchhe, P., Ng, K., & Lau, C. (2023). Novel coal char-based cement grout: An experimental study on geotechnical and rheological properties. *Cement and Concrete Composites*, *141*, 105117.
11. Hossain, M. T., Lau, C., **Yu, H.**, & Ng, K. (2023). Development of coal-derived carbon-based structural unit as a potential building material. *Journal of Materials Science*, *58*, 757-772.

10. **Yu, H.**, Yi, Y., Romagnoli, A., & Tan, W. L. (2023). Effect of ultralow temperature on expansion, strength, and modulus of cement-stabilized soil: Case study for LNG underground storage in Singapore. *ASCE Journal of Cold Regions Engineering*, *37*(1), 05022003.
9. **Yu, H.**, & Ng, K. (2022). Analytical model for failure strength of brittle rocks under triaxial compression and triaxial extension. *ASCE International Journal of Geomechanics*, *22*(4), 06022003.
8. **Yu, H.**, Yi, Y., Romagnoli, A., & Tan, W. L. (2022). Cement soil stabilization for underground liquid natural gas storage. *Cold Regions Science and Technology*, *194*, 103438.
7. **Yu, H.**, Yi, Y., Yao, K., Romagnoli, A., Tan, W. L., & Chang, A. B. P. (2021). Effect of water/cement ratio on properties of cement-stabilized Singapore soft marine clay for wet deep mixing application. *International Journal of Geotechnical Engineering*, *15*(9), 1198-1205.
6. **Yu, H.**, & Ng, K. (2021). New systematic method to determine elastic constants and crack propagation thresholds of brittle rocks under triaxial compression. *Geotechnical and Geological Engineering*, *39*(5), 3931-3945.
5. **Yu, H.**, Yi, Y., & Puppala, A. (2020). Effects of oven temperature and addition of ethanol on the measurement of water content and specific gravity of cement-stabilized soft clay. *ASTM Geotechnical Testing Journal*, *44*(5), 1526-1535.
4. **Yu, H.**, Yi, Y., & Unluer, C. (2020). Heat of hydration, bleeding, viscosity, and setting properties of $Ca(OH)_2$-GGBS and MgO-GGBS grouts. *Construction and Building Materials*, *270*, 121839.
3. **Yu, H.**, Ng, K., Grana, D., Alvarado, V., Kaszuba, J., & Campbell, E. (2020). A generalized power-law failure criterion for rocks based on Mohr failure theory. *International Journal of Rock Mechanics and Mining Sciences*, *128*, 104274.
2. **Yu, H.**, Ng, K., Grana, D., Kaszuba, J., Alvarado, V., & Campbell, E. (2018). Experimental investigation of the effect of compliant pores on reservoir rocks under hydrostatic and triaxial compression stress states. *Canadian Geotechnical Journal*, *56*(7), 983-991.
1. **Yu, H.**, Yin, J., Soleimanbeigi, A., & Likos, W. J. (2017). Effects of curing time and fly ash content on properties of stabilized dredged material. *ASCE Journal of Materials in Civil Engineering*, *29*(10), 04017199.

CONFERENCE PAPERS & ABSTRACTS

14. Gautam, K. **Yu, H.**, Lau, C., & Ng, K. (2026, March 9–12). *Application of coal char in cement-stabilized sodium bentonite-sand soil for subgrade applications* [manuscript submitted]. ASCE Geo-Congress 2026, Salt Lake City, UT.
13. **Yu, H.**, Joshi, P., Lau, C., & Ng, K. (2025, March 2–5). Effects of curing environment and temperature on properties of cement stabilized soil with coal-derived char. In M. Beauregard, & A. Budge (Eds.), *Proceedings of the 2025 Geotechnical Frontiers* (pp 228-236). ASCE.
12. **Yu, H.**, Joshi, P., Lau, C., & Ng, K. (2024, November 20–22). A novel utilization of coal-derived material for pavement. In C. Rujikiatkamjorn, J. Xue, & B. Indraratna (Eds.), *Lecture Notes in Civil Engineering: Vol. 5. Proceedings of the 5th International Conference on Transportation Geotechnics (ICTG) 2024* (pp 97-107).

11. Ng, K., & **Yu, H.** (2023, October 3–5). *Carbon sequestration reservoir at Rock Springs Uplift, Wyoming, USA* [Conference presentation abstract]. 3rd International Symposium on Energy Geotechnics, Delft, Netherlands.
10. **Yu, H.**, Ng, K., Lau, C., Pfeiffer, T., & Horner, R. (2023, June 11–14). *Experimental study and fabrication of high content coal-derived char bricks* [Paper presentation]. 14th North American Masonry Conference, Omaha, NE.
9. Ng, K., Lau, C., Hossain, M. T., **Yu, H.**, Pfeiffer, T., & Horner, R. (2023, June 11–14). *Recent development and manufacturing of coal-derived building materials* [Paper presentation]. 14th North American Masonry Conference, Omaha, NE.
8. Hossain, M. T., Lau, C., **Yu, H.**, Ng, K., & Fan, M. (2022, September 19–22). *Effect of carbonization temperature on the properties of carbon-based structural unit* [Conference presentation abstract]. 39th Annual International Pittsburgh Coal Conference, Virtual Conference.
7. Lau, C., **Yu, H.**, Hossain, M. T., Ng, K., Denzer, A., & Horner, R. (2022, September 19–22). *Manufacturing and life cycle assessment of char-based concrete bricks* [Conference presentation abstract]. 39th Annual International Pittsburgh Coal Conference, Virtual Conference.
6. **Yu, H.**, Lau, C., Hossain, M. T., & Ng, K. (2022, September 19–22). *Effect of alkali on density, compressive strength and thermal conductivity of char-based concrete bricks* [Conference presentation abstract]. 39th Annual International Pittsburgh Coal Conference, Virtual Conference.
5. **Yu, H.**, Yi, Y., Liu, R., & Jiang, N. (2020). Stabilisation of Singapore soft marine clay using a novel sustainable binder for underground construction. In M. Elshafie, G. Viggiani, & R. Mair (Eds.), *Proceedings of the 10th International Symposium on Geotechnical Aspects of Underground Construction in Soft Ground* (pp 842-847). CRC Press.
4. Ng, K., **Yu, H.**, Wang, H., Kaszuba, J., Alvarado, V., Grana, D., & Campbell, E. (2019, June 23–26). *Geomechanical investigation of the carbon sequestration reservoir at Rock Springs Uplift, Wyoming, USA* [Paper presentation]. 53rd U.S. Rock Mechanics/Geomechanics Symposium, New York City, NY.
3. Ng, K., **Yu, H.**, Wang, H., Kaszuba, J., Alvarado, V., Grana, D., & Campbell, E. (2018, June 17–20). *The effect of CO_2 on the mechanical properties of the reservoir sandstone under a low differential pressure* [Paper presentation]. 52nd U.S. Rock Mechanics/Geomechanics Symposium, Seattle, WA.
2. **Yu, H.**, Ng, K., Yin, S., & Mukai, D. (2017, June 25–28). *Experimental analysis of geomechanical and fracture mechanical rock properties* [Paper presentation]. 51st U.S. Rock Mechanics/Geomechanics Symposium, San Francisco, CA.
1. **Yu, H.**, Yin, J., Soleimanbeigi, A., Likos, W. J., & Edil, T. (2016, August 7–11). *Engineering properties of dredged materials stabilized with fly ash* [Paper presentation]. 4th International Conference on Sustainable Construction Materials and Technologies, Las Vegas, NV.

REPORTS

3. Ng, K., **Yu, H.**, Hossain, M. T., & Lau, C. 2023. *Eco-friendly high-performance carbon building material development from coal* (Report No. DOE-UW-FE0031996). U.S. Department of Energy.
2. Kaszuba, J., Alvarado, V., Campbell, E., Grana, D., Ng, K., Stoesz, E., Wang, H., & **Yu, H.** (2019). *Integrated characterization of CO_2 storage reservoirs on the Rock Springs Uplift*

combining geomechanics, geochemistry, and flow modeling (Report No. DOE-UW-FE23328-3). U.S. Department of Energy.

1. Likos, W. J., & **Yu, H.** (2014). *Beneficial use of dredged materials in Great Lakes commercial ports for transportation projects* (Report No. CFIRE 07-06). National Center for Freight and Infrastructure Research and Education.

AFFILIATIONS

- Chartered Member, Engineering New Zealand, 2023 – Present
- Member, Institute of Materials, Minerals and Mining (IOM3), 2022 – Present
- Member, American Society of Civil Engineers (ASCE), 2017 – Present

SERVICES

- University/Departmental Service
  - Faculty Search Committee Member, 2025 – Present
  - Committee Member for MS students, 2025 – Present
    Katelyn Kolb, 2025
    Bishal Babu Karki, 2025
  - Faculty Advisor, ASCE Student Chapter at UT Tyler, 2025 – Present
  - Committee Member, Ratliff Relay Planning Committee, 2025
- Associate Editor
  - Journal of Petroleum Geology, 2025 – Present
- Editorial Board Member
  - Geomechanics and Geoengineering, 2024 – Present
- Guest Editor
  - Applied Sciences, Special Issue: Advanced Research and Applications of Coal-Derived Materials, 2025
- Committee Member of ASCE Geo-Institute
  - Soil Properties and Modeling, 2020 – Present
  - Rock Mechanics and Engineering, 2019 – Present
- Committee Member of ASTM
  - C01 on Cement, 2023 – 2025
  - D18 on Soil and Rock, 2019 – 2025
- Ad Hoc Reviewer, 2018 – Present
  - for over 30 journals, e.g., Advanced Composites and Hybrid Materials, Construction and Building materials, Computers and Geotechnics, etc.

CONFERENCES ATTENDED

- 14th North American Masonry Conference, Omaha, NE, 2023
- 39th Annual International Pittsburgh Coal Conference, Virtual Conference, 2022
- International Conference on Case Histories and Soil Properties, Singapore, 2019
- 51st U.S. Rock Mechanics/Geomechanics Symposium, San Francisco, CA, 2017
- Mid-Continent Transportation Research Symposium, Madison, WI, 2014

- Logistics, Trade, and Transportation Symposium, Gulfport, MS, 2014
- Beneficial Use of Dredged Materials Summit, Louisville, KY, 2013