



Exponent®
Engineering & Scientific Consulting

Abdallah Ikbarieh, Ph.D.

Associate | Civil and Structural Engineering
Atlanta
+1-678-412-4819 | aikbarieh@exponent.com

Professional Profile

Dr. Ikbarieh specializes in geotechnical engineering and computational geomechanics, with expertise in experimental characterization, constitutive modeling, numerical simulation, and engineering analysis of complex geotechnical systems. At Exponent, Dr. Ikbarieh has provided technical support for the investigation of geotechnical and construction-related disputes. His work includes evaluating the performance of foundation systems, assessing the effects of expansive soils and sinkhole-prone ground conditions on infrastructure, investigating drainage and stormwater management issues on residential properties, and supporting analyses of transportation infrastructure projects.

During his doctoral research at the Georgia Institute of Technology, Dr. Ikbarieh investigated the mechanical behavior and flow characteristics of compressible granular materials, including non-recyclable municipal solid waste and woody biomass. His research included the design of an ultra-fast vane shear device to characterize the rate-dependent shear strength of granular materials and the evaluation of compressibility, permeability, and flow behavior of non-recyclable municipal solid waste. He also developed numerical and data-driven approaches, including finite element modeling, smoothed particle hydrodynamics simulations, and machine learning techniques coupled with advanced constitutive models, to predict granular flow behavior in industrial handling equipment. Previously, at Louisiana State University, he conducted numerical analyses of geosynthetic-reinforced pile-supported embankment systems, designed geosynthetic load transfer platforms, and performed stability evaluations of geotechnical earth structures.

Prior to joining Exponent, Dr. Ikbarieh gained practical consulting experience in subsurface exploration, field instrumentation, construction observation, and engineering analysis. His experience included analyzing laboratory and in-situ test data for geotechnical characterization, supporting the design of sheet pile retaining structures, performing slope stability and settlement analyses, evaluating the stability of geomembrane, turf, and solar panel systems against uplift and sliding, supporting dam risk assessment studies, and preparing geotechnical exploration plans, geotechnical data reports, and geotechnical recommendation reports. His field experience included monitoring drilling operations, deep foundation installation and testing activities, as well as installation and maintenance of piezometers for groundwater level monitoring at landfills.

Academic Credentials & Professional Honors

Ph.D., Civil Engineering, Georgia Institute of Technology, 2026

M.S., Civil Engineering, Louisiana State University, 2021

B.S., Civil Engineering, Jordan University of Science and Technology, 2018

Geomaterials Research Award, Geosystems Engineering Group, Georgia Tech, May 2026

Honorable Mention, Annual Fall GI-Georgia Tech Poster Symposium, November 2024

Paul W. Mayne Award, Geosystems Engineering Group, Georgia Tech, May 2024

Dean's Honor List, Jordan University of Science and Technology, 2014-2018

Academic Appointments

Graduate Research Assistant, Georgia Tech, 2021-2026

Graduate Teaching Assistant, Georgia Tech, Spring 2025, Fall 2024, Spring 2023

Graduate Research Assistant, Louisiana State University, 2019-2021

Prior Experience

Geotechnical Intern, Jacobs Engineering, Bellevue, WA, May 2025 – August 2025

Research Intern (Remote Internship), Idaho National Laboratory, Atlanta, GA, January 2021 – May 2021

Geotechnical Intern, Geosyntec Consultants, Kennesaw, GA, May 2022 – August 2022

Professional Affiliations

American Society of Civil Engineers (ASCE)

Publications

Ikbarieh A, Dai SC. An ultra-fast vane shear device with controlled confinement to characterize rate-dependent friction and rheological scaling of plastic particles. *Geotechnical Testing Journal*. (Under Review) 2026.

Ikbarieh A, Dai SC. [Compressibility and permeability of particulated non-recyclable municipal solid waste](#). *Waste Management* 2025; 201:114809.

Ikbarieh A, Jin W, Zhao Y, Saha N, Klinger JL, Xia Y, Dai S. [Machine learning assisted cross-scale hopper design for flowing biomass granular materials](#). *ACS Sustainable Chemistry & Engineering* 2025; 13(16):5838–5851.

Zhao, Y., Jin, W., Ikbarieh, A., Klinger, J. L., Saha, N., Dayton, D. C., & Dai, S. (2024). [SPH modeling of biomass granular flow: engineering application in hoppers and augers](#). *ACS Sustainable Chemistry & Engineering*, 12(10), 4213-4223.

Ikbarieh A, Izadifar M, Abu-Farsakh MY, Voyiadjis GZ. [A parametric study of embankment supported by geosynthetic reinforced load transfer platform and timber piles tip on sand](#). *Transportation Geotechnics* 2023; 38:100901.

Proceeding Publications

Ikbarieh A, Lu Y, Zhao Y, Dai S. [Application of fluid rheology models for milled woody biomass and non-recyclable municipal solid waste particles](#). In *IOP Conference Series: Earth and Environmental Science* 2024; 1330(1):012044). IOP Publishing.

Presentations

Ikbarieh A. CEE 4360 energy and resource recovery guest lecturer. Georgia Tech, Atlanta, GA, 2025.

Ikbarieh A. Machine learning assisted cross-scale hopper design for flowing biomass granular materials. Annual Fall GI-Georgia Tech Poster Symposium, Atlanta, GA, 2024.

Ikbarieh A. A micro-macro hopper flow design for handling granular biomass materials. EMI 2024, Chicago, IL, 2024.

Ikbarieh A. Shear characterization of non-recyclable municipal solid waste (NMSW). Annual Fall GI-Georgia Tech Poster Symposium, Atlanta, GA, 2023.

Ikbarieh A. Shear characterization of particulate rigid plastics from non-recyclable municipal solid waste. EMI 2023, Atlanta, GA, 2023.

Ikbarieh A. Physical characterization of non-recyclable municipal solid waste (NMSW). Annual Fall GI-Georgia Tech Poster Symposium, Atlanta, GA, 2022.

Ikbarieh A. Finite element numerical modeling of geosynthetic-reinforced pile-supported embankments in Louisiana state. Annual Fall GI-Georgia Tech Poster Symposium, Atlanta, GA, 2021.

Ikbarieh A. Instrumentation and modeling of geosynthetic load transfer platform performance. 44th Annual Southwest Geotechnical Engineering Conference, Baton Rouge, LA, 2021.

Project Experience

Design and Construction Disputes

Assisted with technical investigations for disputes related to:

- Foundation system failures and associated structural damage
- Potential deep foundation buckling associated with sinkhole-prone ground conditions
- Surface drainage and stormwater management at residential properties
- Expansive soil effects on structures
- Analysis and evaluation of engineering design changes for Design-Build transportation projects

Geotechnical Internships Experience

Engineering analysis, design, and reporting:

- Coordinated and analyzed laboratory testing of split-spoon and Shelby tube samples to support geotechnical site investigations
- Supported the design of a sheet pile wall to stabilize a riverbank and evaluated constructability with contractors through review of design alternatives and site-specific constraints
- Processed cone penetration and dissipation tests data
- Performed settlement and slope stability analyses for very soft organic muck deposits
- Performed slope stability analyses for landfill projects
- Evaluated stability against uplift and sliding for geomembrane, turf, and solar panel systems

- Extracted significant findings from construction reports, documents, and photographs for a dam risk assessment study
- Assisted in preparing geotechnical logs, geotechnical data reports, and geotechnical recommendation reports

Field investigations, instrumentation, and construction observation:

- Monitored mud rotary and hollow-stem auger drilling operations
- Logged borehole data and performed soil classification
- Observed geophysical surveys, including multichannel and spectral analysis of surface waves
- Observed steel pipe pile driving and verified driving refusal criteria for support of existing underground sewer system
- Collected and processed groundwater table data from piezometers
- Observed static load testing on drilled shafts
- Installed piezometers in landfills
- Performed troubleshooting and maintenance of piezometers in landfills

Peer Reviews

Journal of Geotechnical and Geoenvironmental Engineering