

Majid Hussain, Ph.D.

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Education

Ph.D., Civil Engineering (Geotechnical) July 2014 – Sep 2019
Indian Institute of Technology Gandhinagar, India
Dissertation: "Static and Cyclic Liquefaction Characteristics of Kutch Soils"

B. Tech., Civil Engineering July 2010 – June 2014
National Institute of Technology Srinagar, India

Professional Experience

1. **Assistant Professor,** Civil Engineering March 2021- Present
   National Institute of Technology Srinagar, JK

2. **Postdoctoral Researcher,** MaREI Centre for Marine and Renewable Energy May 2020 – April 2021
   University College Cork, Ireland

3. **Research Assistant,** Civil Engineering Aug 2019 – May 2020
   Indian Institute of Technology Gandhinagar, India

Research Interest

Soil dynamics and earthquake engineering; Liquefaction; Constitutive behavior of granular materials under different boundary and loading conditions; Ground improvement and slope stabilization; Geosynthetics; Mechanical characterization of geomaterials

Teaching Interest

Undergraduate level courses: Soil mechanics; Foundation engineering; Mechanics of Solids; Engineering Mechanics; Ground Improvement Techniques
Graduate level courses: Advanced Soil Mechanics; Advanced Foundation Design; Geotechnical Earthquake Engineering; Geosynthetics in Geotechnical Engineering; Slope Stability and Retaining Structures; Design for Fire

Publications

- *Journal Papers*

1. Ali, M. Z., and **Hussain, M. (2024).** Impact of Particle Characteristics on the Static Liquefaction of Jhelum Riverbed Sand. *Geotechnical and Geological Engineering*, 1-25. https://doi.org/10.1007/s10706-023-02733-w
2. Kenue, A. W., Sana, E., Adhikary, A., Pal, S., & **Hussain, M**. (2023). Assessment of Landfill Leachate and Its Surface and Subsurface Migration: Experimental and Numerical

Investigations. *Journal of Hazardous, Toxic, and Radioactive Waste*, *27*(4), 05023003. https://doi.org/10.1061/JHTRBP.HZENG-1227

3. Gowhar, S., **Hussain, M**., & Srivastava, A. (2023). Stability Assessment of Slopes under Normal Weather and Heavy Rainfall Conditions in the Himalayan Region. *Transportation Infrastructure Geotechnology*, 1-30. https://doi.org/10.1007/s40515-023-00314-1
4. Mir, R. A., Ahmed, R., **Hussain, M.,** Bukhari, S. K., Ahmed, P., Dar, R. A., ... & Bhat, W. A. (2023). Causes, concerns and hazards of sinkhole formation in Brengi stream catchment of Upper Jhelum basin, Kashmir Himalaya. *Environment, Development and Sustainability*, 1-28. https://doi.org/10.1007/s10668-023-03204-1
5. Miftah, A., **Hussain, M.** and Bilsel, H. (2022). Liquefaction Potential Index-Based Hazard Mapping for Benghazi Sabkha Deposits of Libya. Indian Geotechnical Journal. https://doi.org/10.1007/s40098-022-00622-2
6. Gujrati, S., **Hussain, M.** and Sachan, A. Liquefaction Susceptibility of Cohesionless Soils Under Monotonic Compression and Cyclic Simple Shear Loading at Drained/Undrained/Partially Drained Modes. *Transp. Infrastruct. Geotech.* (2022). https://doi.org/10.1007/s40515-022-00226-6
7. **Hussain, M.** and Sachan, A. (2021). Cyclic Simple Shear Behaviour of Saturated and Moist Sandy Soils. ***Geomechanics and Geoengineering: An International Journal, Taylor and Francis***, https://doi.org/10.1080/17486025.2021.1975045.
8. Nazir, R., **Hussain, M.** and Sachan, A. (2020). Influence of stress history, strain rate and end effects on undrained shear behavior and strain localization of Laterite soil. ***International Journal of Geotechnical Engineering, Taylor and Francis,*** https://doi.org/10.1080/19386362.2020.1776019
9. Pain, A., Nimbalkar, S., and **Hussain, M.** (2020). Applicability of Bouc-Wen Model to capture Asymmetric Behaviour of Sand at High Cyclic Shear Strain. ***International Journal of Geomechanics, ASCE***, https://doi.org/10.1061/(ASCE)GM.1943-5622.0001671
10. **Hussain, M.** and Sachan, A. (2019). Static Liquefaction and Effective Stress Path response of Kutch Soils. ***Soils and Foundations, Elsevier***, https://doi.org/10.1016/j.sandf.2019.11.004
11. **Hussain, M.** and Sachan, A. (2019). Effect of Loading Conditions and Stress History on Cyclic Behavior of Kutch soil. ***Geomechanics and Geoengineering: An International Journal, Taylor and Francis***, https://doi.org/10.1080/17486025.2019.1635716
12. **Hussain, M.** and Sachan, A. (2019). Dynamic characteristics of natural Kutch sandy soils. ***Soil Dynamics and Earthquake Engineering, Elsevier***, https://doi.org/10.1016/j.soildyn.2019.105717
13. **Hussain, M.** and Sachan, A. (2019). Dynamic behavior of Kutch soils under cyclic triaxial and cyclic simple shear conditions. ***International Journal of Geotechnical Engineering, Taylor and Francis***, https://doi.org/10.1080/19386362.2019.1608715
14. **Hussain, M.** and Sachan, A. (2017). Evaluation of Earthquake Liquefaction Hazard of Kutch Region. ***Journal of Geotechnical and Transportation Engineering***, 3(2), 52-61.

- *Conference Papers*

1. Sana, E., **Hussain, M** and Dey, A., K. 2023). Adsorption of Heavy Metal Contaminants from Landfill Leachate by Natural Soils: Isotherm and Kinetic Studies. *Indian Geotechnical Conference (IGC-2023)*, IIT Roorkee, India
2. Hussain, M and **Sachan, A** (2022). Undrained Monotonic Compression, Cyclic Triaxial and Cyclic Simple Shear Response of Natural Soils: Strength and Excess Pore Water Pressure Response. *4th International. Conference on Performance-based Design in Earthquake. Geotechnical Engineering (PBD-IV), July 15-17, 2022, Beijing, China*
3. Kenue, A.W., Sana, E., Adhikary, A., **Hussain, M.,** and Pal, S., (2022) Assessment of Subsurface Migratory Behavior of Lead (Pb) Laden Leachate Generated from A Waste Dumpsite in Srinagar, Kashmir, India. International Conference on Recent Advances in Sustainable Environment (RAiSE 2022), India, 26-27 February 2022, LNCE series of Springer

4. Gujarati, S., Shrisvastava, A., **Hussain, M.,** and Sachan, A. (2020). Instability of Silty Sands under Partially Drained Conditions. In *Proceedings of the 7th International Conference on Recent Advances in Geotechnical Earthquake and Soil Dynamics International (ICRAGEE 2020), Bangalore*, India, July 13-16, 2020.
5. Pal, H. S., **Hussain, M.,** Shrisvastava, A., and Sachan, A. (2020). Effect of CSR on Liquefaction Response of Ennore Sand. In *Proceedings of the 7th International Conference on Recent Advances in Geotechnical Earthquake and Soil Dynamics International (ICRAGEE 2020), Bangalore*, India, July 13-16, 2020.
6. Bhamidipati, R., **Hussain, M.,** and Sachan, A. (2020). Influence of Density on the Static Liquefaction Characteristics of a Sandy Kutch Soil. In *Proceedings of the 7th International Conference on Recent Advances in Geotechnical Earthquake and Soil Dynamics International (ICRAGEE 2020), Bangalore*, India, July 13-16, 2020.
7. **Hussain, M.,** and Sachan, A. (2020). Pore Pressure Response of Natural Soils under Various Testing Conditions. In *Proceedings of the 7th International Conference on Recent Advances in Geotechnical Earthquake and Soil Dynamics International (ICRAGEE 2020), Bangalore*, India, July 13-16, 2020
8. Bhamidipati, R., **Hussain, M.,** and Sachan, A. (2019). Effect of Relative Density on Non-linear Stiffness of Sandy Soil. In *Proceedings of the 7th International Congress on Computational Mechanics and Simulation (ICCMS 2019), IndACM*, Mandi, India, December 11-13, 2019.
9. **Hussain, M.** and Sachan, A. (2019). Effect of Inter-Granular Void Ratio on Volume Compressibility and Undrained Shear Response of Base-Sand and Silty-Sand of Kutch. In *Proceedings of the 7th International Symposium on Deformation Characteristics of Geomaterials (IS-Glasgow 2019)*, Glasgow, UK, June 26-28, 2019. https://doi.org/10.1051/e3sconf/20199206002
10. **Hussain, M.** and Sachan, A. (2019). Experimental Study on Static and Cyclic Liquefaction on Cohesionless Chang Dam Soil. In *Proceedings of the 7th International Conference on Earthquake Geotechnical Engineering (VII ICEGE 2019)*, Roma, Italy, June 17-20, 2019. https://doi.org/10.1201/9780429031274
11. **Hussain, M.,** Bhattacharya, D., Sachan, A. (2019) Static Liquefaction Response of Medium Dense Silty-Sand of Chang Dam, *8th International Conference on Case Histories in Geotechnical Engineering, Geo-Congress*, Philadelphia, USA, March24-27, 2019. https://doi.org/10.1061/9780784482100.039
12. Abhijith, TK., **Hussain, M.,** and Sachan, A. (2019). Effect of Stress History on Stress-Strain and Volumetric Response of Laterite Soil under Undrained and Drained Conditions. In *Proceedings of the Symposium on International Association for Computer Methods and Advances in Geomechanics (IACMAG Symposium 2019)*, Gandhinagar, India, March 5-7, 2019
13. **Hussain, M.** (2019). Effect of Lime and Cement on Strength and Volume Change Behaviour of Black Cotton Soil. In *Proceedings of the Symposium on International Association for Computer Methods and Advances in Geomechanics (IACMAG Symposium 2019)*, Gandhinagar, India, March 5-7, 2019
14. **Hussain, M.** and Sachan, A. (2019) Post-liquefaction Reconsolidation and Undrained Cyclic Behaviour of Chang Dam Soil. In *Proceedings of the Symposium on International Association for Computer Methods and Advances in Geomechanics (IACMAG Symposium 2019)*, Gandhinagar, India, March 5-7, 2019
15. **Hussain, M.** and Sachan, A. (2018). Volume Compressibility and Pore Pressure Response of Kutch Soils with varying Plastic and Non-Plastic Fines. In *Proceedings of the International Symposium on Geotechnics for Transportation Infrastructure* (*ISGTI 2018*), Delhi, India, April 7-8, 2018
16. **Hussain, M.** and Sachan, A. (2016). Liquefaction Susceptibility of Soils in Kutch Region. *International Geotechnical Engineering Conference on Sustainability in Geotechnical Engineering Practices and Related Urban Issues, ISSMGE-IGS 2016*, Mumbai, India, September 23-24, 2016.

- *Book Chapters*

1. Gujarati, S., Shrivastava, A., **Hussain, M.,** and Sachan, A. (2021). Instability of Silty Sands Under Partially Drained Conditions. *Soil Dynamics: Select Proceedings of 7th ICRAGEE 2020, 119*, 265. doi: 10.1007/978-981-33-4001-5_24
2. **Hussain, M.,** and Sachan, A. (2021). Pore Pressure Response of Natural Soils Under Various Testing Conditions. *Soil Dynamics: Select Proceedings of 7th ICRAGEE 2020, 119*, 251. doi: 10.1007/978-981-33-4001-5_23
3. Pal, H. S., **Hussain, M.**, Shrivastava, A., and Sachan, A. (2021). Effect of Gradation and Stress Ratio on Liquefaction Response of Ennore Sand. *Soil Dynamics: Select Proceedings of 7th ICRAGEE 2020, 119*, 237. doi: 10.1007/978-981-33-4001-5_22
4. Bhamidipati, R., **Hussain, M.,** and Sachan, A. (2021). Influence of Density on the Static Liquefaction Characteristics of a Sandy Kutch Soil. *Soil Dynamics: Select Proceedings of 7th ICRAGEE 2020, 119*, 193. doi: 10.1007/978-981-33-4001-5_18
5. **Hussain, M.** (2020). Effect of Lime and Cement on Strength and Volume Change Behaviour of Black Cotton Soil. *Advances in Computer Methods and Geomechanics*, Chapter 54, doi.org/10.1007/978-981-15-0890-5_54
6. **Hussain, M.** and Sachan, A. (2020) Post-liquefaction Reconsolidation and Undrained Cyclic Behaviour of Chang Dam Soil. *Advances in Computer Methods and Geomechanics*, Chapter 7, doi: 10.1007/978-981-15-0886-8_7
7. Abhijith, TK., **Hussain, M.,** and Sachan, A. (2020). Effect of Stress History on Stress-Strain and Volumetric Response of Laterite Soil under Undrained and Drained Conditions. *Advances in Computer Methods and Geomechanics*, Chapter 8, doi: 10.1007/978-981-15-0886-8_8
8. **Hussain, M.** and Sachan, A. (2019). Volume Compressibility and Pore Pressure Response of Kutch Soils with varying Plastic and Non-Plastic Fines. *Geotechnics for Transportation Infrastructure*, Chapter 52, ISBN: 978-981-13-6712-0, doi: 10.1007/978-981-13-6713-7_52

Unique Expertise:

Laboratory Testing: Dynamic triaxial testing; Cyclic simple shear testing; Monotonic and K_0 triaxial testing; CU/CD compression and extension triaxial testing; XRD (Soil Mineralogy); Problem soil investigation and testing.
Field testing: SPT; DCPT; CPT; Plate Load Test; Field Permeability; Pile Load Test; Pressuremeter Test
Software: PLAXIS-3D; GEO-STUDIO; GEO-5; ReSSA; ReSlope; MSEW

Student Mentoring as Research Scholar:

1. Stabilization of Slopes Using Geo-Synthetics (Summer Research Internship Program Project).
2. Effective Techniques for Slope Stabilization of Expansive Clayey Soils (Summer Research Internship Program Project).
3. Stabilization of slopes using Geo-Synthetics and chemical treatment (Summer Research Internship Program Project).
4. Flexural and Compressive Strength Properties of Engineered Cementitious Composite (Under Graduate Project)
5. Study of Cyclic Instability of Soft Clays (Graduate research course project)
6. Effect of Plastic and Non-Plastic Fines on the Compactibility and Permeability Response of Sabarmati Sand (Graduate research course project)

7. Effect of particle size, particle shape, and gradation on direct shear and simple shear response of sand (Graduate Project)

Membership

Associate member of American Society of Civil Engineer, A.M. ASCE
Student member of International Society of Soil Mechanics and Geotechnical Engineering, ISSMGE
Student member of Indian Geotechnical Society, IGS
Student member of International Geosynthetics Society, igs

Work Experience

- **Teaching Experience**

S.No	Course Name	Spring	Autumn	Institute
01	CGE202: Advanced Foundation Engineering	2022-23		NIT Srinagar
02	CVT352: Geotechnical Engineering-II	2022-23		NIT Srinagar
03	CVT303: Geotechnical Engineering-I		2022-23	NIT Srinagar
04	CVT252: Surveying-II		2021-22	NIT Srinagar
05	CVT203: Surveying-I	2021-22		NIT Srinagar
06	CVT455: Ground Improvement Techniques	2021-22		NIT Srinagar
07	CIL100: Engineering Mechanics	2021-23		NIT Srinagar
08	CE601: Advanced Geotechnical Engineering		2015-2018	IIT Gandhinagar
09	CE602: Advanced Foundation Design	2016-2018		IIT Gandhinagar
10	CE301: Soil Mechanics, Laboratory		2015-2018	IIT Gandhinagar
11	CE402: Geotechnical Engineering	2016		IIT Gandhinagar

- **Conducting Workshops and Conferences**

1. Geotechnical Engineering Laboratory hands-on-session in "Short Course on Geotechnical Investigations for Structural Engineering," 2014
2. Hands-on and data analysis session for Soil Mechanics Laboratory in "Summer School-Geotechnical Engineering Laboratory" under Knowledge Network of IIT Gandhinagar under TEQIP-II initiative (MHRD, Govt. of Gujarat), 2015.
3. Geotechnical Engineering Laboratory hands-on-session in "Short Course on Geotechnical Investigations for Structural Engineering," 2015
4. Research Methodology workshop under TEQIP-II initiative (MHRD, Govt. of Gujarat), 2015.
5. Tutorial Sessions in "Summer School-Soil Mechanics and Foundation Engineering" under Knowledge Network of IIT Gandhinagar under TEQIP-II initiative (MHRD, Govt. of Gujarat), 2016.
6. Hands-on and data analysis session for Soil Mechanics Laboratory in "Summer School-Geotechnical Engineering Laboratory" under Knowledge Network of IIT Gandhinagar under TEQIP-II initiative (MHRD, Govt. of Gujarat), 2016.
7. Geotechnical Engineering Laboratory hands-on-session in "Short Course on Geotechnical Investigations for Structural Engineering," 2017.
8. Short Course on Faculty Induction Programme {TEQIP III}, 29 Jan. -9 Feb., 2018
9. Training Program- Gujarat Maritime Board, 7^{th} – 25^{th} May 2018.
10. DFI India 2018: 8th Conference on Deep Foundation Technologies for Infrastructure Development in India, 15-16 November, 2018
11. IACMAG Pre-Symposium Workshop, 4^{th} March 2019
12. International IACMAG Symposium, 5-7 March 2019

13. Summer Training Program on Advanced Pedagogy and Digital Tools, 20th May – 14 June, 2019

Continuing Education (Short courses/Workshops attended):

Date	Institute	Short Course
Sep. 2014	IITGN	X-Ray Diffraction
Oct. 2014	IITGN	Displacement-based methods in seismic design and assessment
Jan.2015	IITGN	Mechanics in Engineering
Sep. 2015	IITGN	Earthquake Seismology and Tectonics
Nov. 2015	IITGN	Ground Improvement
Jun. 2016	IITKgp	Geotechnical Site Characterization and In-situ Testing with Emphasis on Assessment of Liquefaction Susceptibility
May 2018	IITGN	Design of Reinforced Concrete Structures for Earthquake and Fire as per NBC 2016

Lectures Delivered/ Invited Lectures

1. Liquefaction Susceptibility of Soils in Kutch Region, TEQIP Symposium on Infrastructure Development: Safety and Sustainability, *IIT Gandhinagar*, 4-5 Nov. 2016.
2. Earth Pressure and Design of Earth Retaining Structures at *IUST Awantipora*, Pulwama, 9th July 2018.

Graduate Level Courses (CGPA = 8.59 out of 10.0):

1. Advanced Soil Mechanics
2. Advanced Solid Mechanics
3. Advanced Structural Analysis
4. Finite Element Methods
5. Mathematical Methods for Engineers
6. Advanced Foundation Engineering
7. Structural Stability and Control
8. Structural Design for Fire
9. Numerical Methods in Engineering
10. Earthquake Engineering
11. Geosynthetics
12. Slopes and Retaining Structures
13. Projects
    - *i. Erosion Studies in Himalayas*
    - *ii. Geological Aspects of Clay Mineralogy*
    - *iii. Application of Carbon Material for Removal of Natural Organic Matter from Water*
    - iv. *Alternative solutions for Black Cotton Soil*

Awards and Accomplishments:

S. No.	*Name of Award*	*Awarding Agency*	*Year*
1.	Young Geotechnical Engineer Best Paper Award	International Symposium on Geotechnics of Transportation Infrastructure	2018
2	PhD Research Award	International Association for Computer Methods and Advances in Geomechanics (IACMAG)	2019
3	Hongshen Young Teacher (Postdoctoral fellowship)	School of Civil Engineering at Chongqing University, China	2019
4	Postdoctoral Fellow	MaREI, Research Centre for Energy, Climate and Marine University College Cork, Ireland	2020