Nripojyoti Biswas

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CV Date: 10/08/2024

EDUCATION

Ph.D., Civil Engineering, Texas A&M University, College Station, 2022

M.Tech., Civil Engineering, Indian Institute of Technology, Kanpur, 2017

B.E, Civil Engineering, Indian Institute of Engineering Science and Technology, Shibpur, 2013

EXPERIENCE

2024 - present	Assistant Professor of Civil & Environmental Eng., University of Massachusetts Lowell
2023 - 2024	Senior Research Engineer-1, Texas A&M University, College Station, Texas
2022 - 2023	Postdoctoral Researcher, Texas A&M University, College Station, Texas
2013 - 2014	Graduate Engineering Trainee, Shapoorji Palonji Constructions, Kolkata, India

HONORS AND AWARDS

- Terracon Endowed Fellowship in Geotechnical Engineering, 2021
- Hooper Fellowship in Geotechnical Engineering, 2020
- Geo-Institute Travel Award (Geo-Congress), 2020
- Zachry Department of Civil and Environmental Engineering Travel Award for TRB 2020, 2019
- Academic Excellence Award for Outstanding Civil Engineering PhD Student, The University of Texas at Arlington, 2019

TEACHING EXPERIENCE

Course #	***Title***	***Term***	***Enrollment***
CIVE 5310	Advanced Soil Mechanics	Fall 2024	15
CVEN 720	Design with Geosynthetics (Taught at TAMU)	Fall 2023	12

SERVICE

- Member of ASCE GI Committee on Sustainability in Geotechnical Engineering
- Member of Transportation Research Board Standing Committee on Geosynthetics (AKG80)
- Review Coordinator for papers on Pavements for ASCE GeoCongress 2024
- Paper reviewer for:
    - Geosynthetics International
    - Géotechnique
    - ASCE Journal of Materials in Engineering

- Transportation Geotechnics
- ASCE Journal of Geotechnical and Geoenvironmental Engineering
- ASTM Advances in Civil Engineering Materials
- Transportation Research Record- Journal of Transportation Research Board
- Springer Nature Scientific Reports
- International Journal of Pavement Research and Technology
- Geotextiles and Geomembranes
- ASTM Geotechnical Testing Journal
- International Journal of Pavement Engineering
- ICE Proceedings of Civil Engineering-Ground Improvement
- Transport - Proceedings of the ICE

PUBLICATIONS

Google Scholar

Archival Journal Publications

1. **Biswas, N.**, Puppala, A.J., Chakraborty, S. and Little, D. 2024. Micro-mechanical behavior of nano-silica in suppressing ettringite-induced heave. Canadian Geotechnical Journal, (in production) doi:10.1139/cgj-2023-0051.

2. **Biswas, N.**, Puppala, A.J., and Chakraborty, S. 2024. Experimental Studies and Sustainability Assessments of Quarry Dust for Chemical Treatment of Expansive Soils. Geotechnical Testing Journal, 47(1): 20220243. doi:10.1520/GTJ20220243.

3. Gajurel, A., Puppala A.J., **Biswas, N.**, and Chimauriya, H. 2024. Application of Satellite-based Remote Sensing for the Management of Pavement Infrastructure Assets. Transportation Research Record - Journal of Transportation Research Board https://doi.org/10.1177/0361198124123053

4. Chou, S., **Biswas, N.**, Puppala, A.J., Huang, O. and Radovic, M. 2024. Evaluation of Locally Available Calcined Clay-Based Geopolymer for Stabilization of Expansive Soils Transportation Research Record - Journal of Transportation Research Board https://doi.org/10.1177/03611981241235189

5. Kumar, P., Puppala A.J., **Biswas, N.**, Congress, S.SC., Tingle, J., and Little D. 2024 Assessment of Durability of Chemically Stabilized Soils Using Different Moisture-Susceptible Methods Transportation Research Record - Journal of Transportation Research Board (accepted)

6. **Biswas, N.**, Puppala, A.J., and Chakraborty, S. 2023. Role of Nano- and Crystalline Silica to Accelerate Chemical Treatment of Problematic Soil. Journal of Geotechnical and Geoenvironmental Engineering, 149(7). doi:10.1061/JGGEFK.GTENG-10999

7. **Biswas, N.**, Puppala, A.J., and Ramineni, K. 2023. Durability and Permanency Studies in Sulfate-Laden Soils Treated with Nano- and Crystalline Silica-Based Admixtures. ASCE Journal of Materials in Civil Engineering doi: 10.1061/JMCEE7/MTENG-16456

8. Khan, M.A., Puppala, A.J., **Biswas, N.**, and Congress, S.S.C. 2023. Evaluation of structural performance of the geocell reinforced flexible pavement Transportation Geotechnics, https://doi.org/10.1016/j.trgeo.2023.101021

9. Chakraborty, S., Puppala, A.J., and **Biswas, N.** 2022. Role of crystalline silica admixture in mitigating ettringite-induced heave in lime-treated sulfate-rich soils. Géotechnique,: 1–17. doi:10.1680/jgeot.20.p.154

10. Congress, S.S.C., Puppala, A.J., Khan, M.A., **Biswas, N.**, Kumar, P. 2022. Application of Unmanned Aerial Technologies for Inspecting Pavement and Bridge Infrastructure Asset Condition. Transportation Research Record: Journal of the Transportation Research Board, https://doi.org/10.1177/03611981221105273.

11. Jang, J., **Biswas, N.**, Puppala, A.J., Congress, S.S.C., Radovic, M., Huang, O., 2022. Evaluation of Geopolymer for Stabilization of Sulfate-Rich Expansive Soils for Supporting Pavement Infrastructure. Transportation Research Record: Journal of the Transportation Research Board, https://doi.org/10.1177/03611981221086650.

12. **Biswas, N.**, Puppala, A. J., Khan, M. A., Congress, S. S. C., Banerjee, A. and Chakraborty, S. 2021. Evaluating the Performance of Wicking Geotextile in Providing Drainage for Flexible Pavements Built over Expansive Soils. Transportation Research Record: Journal of the Transportation Research Board p. 036119812110013. https://doi.org/10.1177/03611981211001381.

13. Khan, M.A., **Biswas, N.**, Banerjee, A., and Puppala, A.J. 2020. Field Performance of Geocell Reinforced Recycled Asphalt Pavement Base Layer. Transportation Research Record: Journal of the Transportation Research Board, 2674(3): 69–80. doi:10.1177/0361198120908861.

14. **Biswas, N.**, and Ghosh, P. 2019. Bearing Capacity Factors for Isolated Surface Strip Footing Resting on Multi-layered Reinforced Soil Bed. Indian Geotechnical Journal, 49(1). doi:10.1007/s40098-017-0293-z.

15. **Biswas, N.**, and Ghosh, P. 2018. Interaction of adjacent strip footings on reinforced soil using upper-bound limit analysis. Geosynthetics International, 25(6): 599–611. Thomas Telford Ltd . doi:10.1680/jgein.18.00020.

Book Chapters

1. Puppala, A.J., **Biswas, N.**, Khan, M.A., and Congress, S.S.C 2024. Sustainable Ground Improvement Practices and Comprehensive Assessments for Problematic Expansive Soils. Geotechnics and Sustainable Development, *Lecture Notes in Civil Engineering Edited by* H. Hazarika, S. K. Haigh, B. Chaudhary, M.Murai, S. Manandhar, Fukuoka, Japan, Springer, Singapore.

2. **Biswas, N.**, Khan, M.A., Rameneni, K., and Puppala, A.J. 2023. Performance of Low-Volume Roads Built Over Expansive Soils Reinforced with Wicking Geotextiles. TR Circular E-C283: 13th International Conference on Low-Volume Roads. Cedar Rapids, Iowa. pp. 33–41.

3. **Biswas, N.**, Khan, M.A., Banerjee, A., Puppala, A.J., and Chakraborty, S. 2022. Application of Wicking Geotextile for Pavement Infrastructure on Expansive Soil. In Advances in Transportation Geotechnics IV. Edited by E. Tutumluer, S. Nazarian, I. Al-Qadi, and I.I.A. Qamhia. Springer International Publishing, Cham. pp. 533–544.

4. Khan, M.A., **Biswas, N.**, Banerjee, A., Congress, S.S.C., and Puppala, A.J. 2022. Effectiveness of Double-Layer HDPE Geocell System to Reinforce Reclaimed Asphalt Pavement (RAP)-Base Layer. In Advances in Transportation Geotechnics IV. Edited by E. Tutumluer, S. Nazarian, I. Al-Qadi, and I.I.A. Qamhia. Springer International Publishing, Cham.pp. 593–604.

5. **Biswas, N.**, Chakraborty, S., Puppala, A.J., and Banerjee, A. 2021. A Novel Method to Improve the Durability of Lime-Treated Expansive Soil. *In* Proceedings of the Indian Geotechnical Conference 2019: Lecture Notes in Civil Engineering. *Edited by* S.S.K. Patel S., Solanki C.H., Reddy K.R. Springer, Singapore. pp. 227–238.

Geotechnical Special Publications

1. Chimauriya, H., **Biswas, N.**, Puppala, A.J., , and Gajurel, A. Effect of Storm Surge-Induced Scour on the Bearing Capacity of Shallow Foundation for Coastal Residential Buildings. In Geoenvironmeet 2024, Portland, Oregon *(Accepted)*

2. Rameneni, K., Congress, S.S.C., **Biswas, N.**, Puppala, A.J., , and Kriegstein, S. An Experimental Study to Evaluate the Performance of Fiber-Based Cement Mixture Bags as Alternative Flood and Erosion Barriers. In Geoenvironmeet 2024, Portland, Oregon *(Accepted)*

3. Chimauriya, H., Caldwell, C., Puppala, A.J., **Biswas, N.**, and Congress, S.S.C. Role of EPS Geofoams in Reducing Thermal Losses from Slab-On-Grade Foundations under Freezing Conditions. In Geo-Congress 2024 doi: 10.1061/9780784485330.067.

4. Chou, S., **Biswas, N.**, Puppala, A.J., and Jafari, N. Stabilization of Coastal Soils to Improve Resiliency of Transportation Infrastructure after Storm Surge Events. In Geo-Congress 2024 doi: 10.1061/9780784485330.027.

5. Kumar, A., **Biswas, N.**, Puppala, A.J., and Khan, M.A. Investigations on Fully-Softened Strength of Lime-Treated Slopes Built with Expansive Soils Under Future Extreme Precipitation. In Geo-Congress 2024 doi: 10.1061/9780784485354.014.

6. Gajurel, A., Puppala A.J., **Biswas, N.**, and Chimauriya, H. Use of Orbital Synthetic Aperture Radar Data in Monitoring Geotechnical and Transportation Infrastructure Assets. In Geo-Congress 2024 doi: 10.1061/9780784485347.052.

7. Mukherjee, A., Justin, A., Chakraborty, S., **Biswas, N.**, Puppala, A.J. and Roy, S. Utilization of Quarry Fines as a Sustainable Admixture for Suppressing Ettringite-Induced Heaving. In Geo-Congress 2024 doi: 10.1061/9780784485330.035.

8. Jang, J., **Biswas, N.**, Puppala, A.J., Congress, S.S.C., Radovic, M. and Huang, O. Application of Metakaolin-Based Geopolymer for Eco-Friendly Stabilization of Coastal Soils. In Geo-Congress 2024 doi: 10.1061/9780784485330.052.

9. Gajurel, A., Chimauriya, H., **Biswas, N.**, Boluk, B., Congress, S.S.C., and Puppala, A.J. 2023. Post-Construction Monitoring of Rehabilitated Highway Embankment Slope in Texas. In Geo-Congress 2023. American Society of Civil Engineers, Reston, VA. pp. 116–125.

10. Khan, M.A., **Biswas, N.**, Banerjee, A., and Puppala, A.J. 2023. Effects of Traffic Loading Magnitude and Frequency on the Performance of Geocell-Reinforced Flexible Pavements. In Geo-Congress 2023. American Society of Civil Engineers, Reston, VA. pp. 517–525.

11. Samridh, Jain, A., Chakraborty, S., **Biswas, N.**, Puppala, A.J., and Ramineni, K. 2023. Durability and Recuperative Properties of Lime Stabilized Soils. In Geo-Congress 2023. American Society of Civil Engineers, Reston, VA. pp. 440–451.

12. Jang, J., Puppala, A.J., **Biswas, N.**, Chakraborty, S., and Radovic, M. 2022. Utilization of Metakaolin-Based Geopolymers for Stabilization of Sulfate-Rich Expansive Soils. In Geo-Congress 2022. American Society of Civil Engineers, Reston, VA. pp. 222–231.
13. Khan, M.A., Puppala, A.J., **Biswas, N.**, Congress, S.S.C., and Jafari, K.H. 2022. An Analytical Approach to Estimate the Load-Bearing Capacity of Subgrade Soil with a Geocell-Reinforced Base Layer. In Geo-Congress 2022. American Society of Civil Engineers, Reston, VA. pp. 380–389.
14. **Biswas, N.**, Puppala, A.J., Chakraborty, S., and Khan, M.A. 2021. Utilization of Silica-Based Admixture to Improve the Durability of Lime-Treated Expansive Soil. In IFCEE 2021. pp. 233–242.
15. **Biswas, N.**, Chakraborty, S., Mosadegh, L., Puppala, A.J., and Corcoran, M. 2020. Influence of Anisotropic Permeability on Slope Stability Analysis of an Earthen Dam during Rapid Drawdown. In Geo-Congress 2020. American Society of Civil Engineers, Reston, VA. pp. 29–39.
16. Khan, M.A., **Biswas, N.**, Banerjee, A., and Puppala, A.J. 2020. Performance of Geocell-Reinforced Recycled Asphalt Pavement (RAP) Bases in Flexible Pavements Built on Expansive Soils. In Geo-Congress 2020. American Society of Civil Engineers, Reston, VA. pp. 488–497.
17. Mosadegh, L., Chakraborty, S., **Biswas, N.**, Bhaskar, P., and Puppala, A.J. 2020. Comparison of Earthquake-Induced Pore Water Pressure and Deformations in Earthen Dams Using Non-Linear and Equivalent Linear Analyses. In Geo-Congress 2020. American Society of Civil Engineers, Reston, VA. pp. 151–160.

Conference Proceedings

1. Chou, S., **Biswas, N.** and Puppala, A.J. Machine learning methods to predict resilient moduli behavior of subgrade soils. *In* 5th ICTG (International Conference on Transportation Geotechnics), Sydney, Australia.
2. Rameneni, K., **Biswas, N.**, Puppala, A.J., and Khan, M.A. Experimental Investigation of Geogrid Reinforced Unpaved Sections Under Repeated Loads. *In* 5th ICTG (International Conference on Transportation Geotechnics), Sydney, Australia.
3. Rameneni, K., Puppala, A.J., Khan, M.A., **Biswas, N.**, and Kumar, P. Role of High-Modulus Geogrids in Improving Base Layer Properties. *In* Geosynthetics Conference 2023. Kansas, MO.
4. Rameneni, K., Khan, M.A., **Biswas, N.**, and Puppala, A.J. Evaluation of the Performance of the Geocell and Geogrid Reinforced Pavement Sections Constructed Over Weaker Subgrade Conditions Based on Large-Scale Repeated Load Tests. Transportation Research Board Annual Meeting 2023.
5. **Biswas, N.**, Chakraborty, S.,and Puppala, A.J. 2022. Mitigating Ettringite-Induced Heaving in Lime-Treated Sulfate-Rich Soils Using Crystalline Silica Admixture. *In* Proc of 20th ICSMGE 2022, Sydney, Australia.
6. **Biswas, N.,** A. J. Puppala, M. A. Khan, S. S. C. Congress, and S. Chakraborty. 2021 Depth of Influence of a Wicking Geotextile below the Flexible Pavement Constructed over Expansive Subgrade. *In* Geosynthetics Conference 2021. Kansas, MO. pp. 583-594
7. Jang, J., Puppala, A.J., Chakraborty, S., **Biswas, N.**, Huang, O., and Radovic, M. 2021. Eco-Friendly Stabilization of Sulfate-Rich Expansive Soils Using Geopolymers for Transportation Infrastructure. In Tran-SET 2021. American Society of Civil Engineers, Reston, VA. pp. 223–231.

PRESENTATIONS

Keynotes

"Role of Silica-Based Admixtures for Effective Stabilization of Problematic Soils" - Young Researcher Special Speaker – *2nd International Conference on Construction Resources for Environmentally Sustainable Technologies*, Fukuoka, Japan, November 2023.

"Chemical Stabilization of Problematic Soils with Traditional Calcium-based and Non-traditional Stabilizers" *Cement Stabilization & RCC Conference,* Arlington, Texas, September 2022.

Workshops

"Integrated Approach for Geotechnical and Hydrodynamic Analyses in Coastal Residential Built Infrastructure: A Holistic Perspective" - *Coastal Research and Education Actions for Transportation Equity (CREATE): A USDOT Tier-1 University Transportation Center*, San Marcos, Texas, July 2024.

"Opportunities, Challenges, and Perspectives on Base and Subgrade Stabilization with Nontraditional Stabilizers" - *Transportation Research Board Annual Meeting, Washington DC,* January, 2024.

"Application of wicking geotextile for pavement infrastructures on expansive soils" - *Transportation Research Board Annual Meeting, Washington DC,* January, 2023.

Conference Presentations

"Role of Silica-rich Admixtures and Geopolymers for Effective Stabilization of Problematic Soils with a Focus on Sustainability and Durability," *20th Arizona Pavements/Materials Conference*, Memorial Union (MU), ASU at the Tempe Campus, 2023.

"Performance of Low-Volume Roads Built Over Expansive Soils Reinforced with Wicking Geotextiles," *13th International Conference on Low-Volume Roads*, Cedar Rapids, Iowa, 2023.

"Effects of Traffic Loading Magnitude and Frequency on the Performance of Geocell-Reinforced Flexible Pavements," *ASCE Geo-Congress*, Los Angeles, CA, 2023.

"Evaluating the Performance of Wicking Geotextile in Providing Drainage for Flexible Pavements Built over Expansive Soils," *Transportation Research Board Annual Meeting*, Washington DC, 2021.

"Depth of Influence of a Wicking Geotextile below the Flexible Pavement Constructed over Expansive Subgrade," *Geosynthetic Conference*, Kansas 2021.

"Utilization of Silica-Based Admixture to Improve the Durability of Lime-Treated Expansive Soil," *IFCEE*, Dallas, TX, 2021.

"A Novel Method to Improve the Durability of Lime-Treated Expansive Soil," *Indian Geotechnical Conference*, Surat, India, 2019.