

Curriculum Vitae

SURYA SARAT CHANDRA CONGRESS, Ph.D., A.M.ASCE

Assistant Professor

FAA Certified Drone Pilot

Department of Civil, Construction and Environmental Engineering

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Academic CV

RESEARCH AREAS

Transportation Infrastructure, Design and Stabilization of Geo-Materials, Sustainable and Resilient Infrastructure Design and Monitoring, Site Characterization and Visualization Models, Slope Stabilization, Dam and Bridge Inspections, Airport Pavement Inspections, Artificial Intelligence, Image Analysis, Digital Twins, Disaster Response, Traffic Safety, and Smart City Concepts.

EDUCATIONAL BACKGROUND

University of Texas at Arlington (UTA)	Civil Engineering	Ph.D., 2018
Indian Inst. of Technology (IIT), Kharagpur	Civil Engineering	M.Tech., 2014
JNTU, Kakinada	Civil Engineering	B.Tech., 2012

PROFESSIONAL EXPERIENCE

Assistant Professor, Department of Civil, Construction and Environmental Engineering
North Dakota State University, Fargo, North Dakota, USA, August 2022-Present

Senior Research Engineer II, Zachry Department of Civil and Environmental Engineering,
Texas A&M University, College Station, USA, April 2021-August 2022

Associate Research Scientist, Zachry Department of Civil and Environmental Engineering,
Texas A&M University, College Station, USA, September 2019 – March 2021

Post-Doctoral Research Associate, College of Engineering, University of Texas at Arlington,
USA, Dec 2018 – December 2019

Graduate Research Assistant, Department of Civil Engineering, University of Texas at
Arlington, USA, 2016 – 2018

Assistant Professor, Department of Civil Engineering, GIER, Affiliated to Jawaharlal Nehru
Technological University, India 2014 – 2016

Graduate Research Assistant, Department of Civil and Environmental Engineering, Technical
University Darmstadt, Germany, 2013 – 2014

Graduate Research Assistant, Department of Civil Engineering, Indian Institute of Technology
Kharagpur, 2012 – 2013

TEACHING

Graduate Courses Taught:

- CE 6312 - In-Situ Testing and Interpretation methods (UT Arlington)
- CVEN 689- Geosynthetics (Guest Lectures, TAMU)
- CVEN 667- Slope Stability and Retaining Walls (Guest Lectures, TAMU)
- CVEN 689- Ground Improvement (Guest Lectures, TAMU)

Undergraduate Courses Taught:

- Soil Mechanics - Course and Laboratory
- Pavement Design and Evaluation - Course and Laboratory
- Surveying - Course and Laboratory

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- Environmental Engineering
- Air Pollution
- Engineering Drawing
- Construction and Building Materials
- Ethics in Civil Engineering

COURSE DEVELOPMENT

Revised Courses (One)

- CE 6312 (In Situ Testing and Interpretation) is an advanced graduate-level course. The main objective of this course is to teach several geotechnical in-situ methods and their applications for soil characterization, settlement evaluation, and infrastructure foundation design. It was revised to introduce the application of unmanned aerial sensors for field data collection. A few case studies performed in my research projects and published in papers were discussed in detail.

SOFTWARE PROFICIENCY

Arc-GIS, Auto CAD, Bentley, Metashape, Pix4D, Python, Geo-Studio, SLIDE 3, TSLOPE, and MS Office

RESEARCH MENTORING

Student Researchers (At TAMU, UTA, LSU, and CalPoly)

- 12 PhDs
- 6 Masters
- 20 Undergraduates (Including NSF REU Students)

PUBLICATIONS (Total - 73 Publications: 4 Book Chapters, 39 Journal Papers, and 30 Refereed Conference Papers)

Book Chapters (4)

1. Puppala, A.J., Banerjee, A., **Congress, S.S.C.** (2020) "Geosynthetics in Geo-Infrastructure Applications." Durability of Composite Systems, Woodhead Publishing Series in Composites Science and Engineering, 2020, Pages 289-312, doi.org/10.1016/B978-0-12-818260-4.00007-7.
2. Puppala, A.J., and **Congress, S.S.C.** (2020). "A Holistic Approach for Visualization of Transportation Infrastructure Assets Using UAV-CRP Technology." In: Correia A., Tinoco J., Cortez P., Lamas L. (eds) Information Technology in Geo-Engineering. ICITG 2019. Springer Series in Geomechanics and Geoenvironmental Engineering. Springer, Cham. https://doi.org/10.1007/978-3-030-32029-4_1
3. Banerjee, A., Puppala, A.J., **Congress, S.S.C.**, Chakraborty, S., Pedarla, A. (2020). "Recent Advancements in Predicting the Behavior of Unsaturated and Expansive Soils." Lecture Notes in Civil Engineering, Springer Publishers, Springer Nature, Singapore, 2020 (in press)
4. Puppala, A.J., **Congress, S.S.C.**, Banerjee, A. (2019) "Research Advancements in Expansive Soil Characterization, Stabilization and Geoinfrastructure Monitoring." Frontiers in Geotechnical Engineering, Developments in Geotechnical Engineering, Springer Nature, Singapore, 2019, Chapter 2, https://doi.org/10.1007/978-981-13-5871-5_2.

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Journals (39)

Papers in Press and Accepted for Publication

1. **Congress, S.S.C.**, Puppala, A. J., Clayton, T., Gurganus, C., and Halley, J. (2022). "Application of Unmanned Aerial Vehicles (UAVs) for Monitoring Airport Asset Surfaces." *Transportation Research Record: Journal of the Transportation Research Board*. (Accepted)
2. **Congress, S.S.C.**, Puppala, A. J., Khan, M. A., Biswas, N., and Kumar, P. (2022). "Application of Unmanned Aerial Technologies for Inspecting Pavement and Bridge Infrastructure Assets Conditions." *Transportation Research Record: Journal of the Transportation Research Board*. <https://doi.org/10.1177/03611981221105273>
3. Duan, W., **Congress, S. S. C.**, Cai, G., Zhao, Z., Liu, S., Dong, X., Chen, R., & Qiao, H. (2022). "Prediction of in situ state parameter of sandy deposits from CPT measurements using optimized GMDH-type neural networks." *Acta Geotechnica*, 1-21.
4. Jang, J., Biswas, N., Puppala, A.J., **Congress, S. S. C.**, Radovic, M., and 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*. (Accepted)
5. Kumar, P., Puppala, A. J., Tingle, J. S., Chakraborty, S., and **Congress, S. S. C.** (2022). "Resilient Characteristics of Polymer Emulsion Treated Sandy Soil." *Transportation Research Record: Journal of the Transportation Research Board*. (Accepted)
6. Patil, U. D., Shelton, A. J., Catahay, M., Kim, Y. S., & **Congress, S. S. C.** (2022). "Influence of vegetation in improving the stability of a hill slope in a tropical climate setting." *Environmental Geotechnics*, 1-17.
7. Liu, X., **Congress, S. S. C.**, Cai, G., Liu, L., & Puppala, A. J. (2022). "Evaluating the thermal performance of unsaturated bentonite-sand-graphite as buffer material for waste repository using an improved prediction model." *Canadian Geotechnical Journal*, (ja).
8. Chen, R., **Congress, S. S. C.**, Cai, G., Zhou, R., Xu, J., Duan, W., & Liu, S. (2022). "Evaluating the effect of active ions on the early performance of soft clay solidified by modified biomass waste-rice husk ash." *Acta Geotechnica*, 1-18.
9. Dao, D. H., Tran, T. Q., **Congress, S. S.C.**, Puppala, A. J., Hai, N. M., & Kim, Y. S. (2022). "Evaluating the Performance of Large-Diameter Bored Piles Socketed in Weathered Rock." *Indian Geotechnical Journal*, 1-12.
10. **Congress, S.S.C.**, Puppala, A. J., Kumar, P., Banerjee, A., and Patil, U. D. (2021). "Methodology for Resloping of Rock Slope Using 3D Models from UAV-CRP Technology." *ASCE Journal of Geotechnical and Geoenvironmental Engineering*. [https://doi.org/10.1061/\(ASCE\)GT.1943-5606.0002591](https://doi.org/10.1061/(ASCE)GT.1943-5606.0002591)

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11. **Congress, S.S.C.**, and Puppala, A.J. (2021). “Geotechnical Slope Stability and Rockfall Debris Related Safety Assessments of Rock Cuts Adjacent to a Rail Track Using Aerial Photogrammetry Data Analysis” *Transportation Geotechnics*, Elsevier Publishers. <https://doi.org/10.1016/j.trgeo.2021.100595>
12. **Congress, S.S.C.**, and Puppala, A. J. (2021). “A Road Map for Geotechnical Monitoring of Transportation Infrastructure Assets using Three-Dimensional Models Developed from Unmanned Aerial Data.” *Indian Geotechnical Journal*, 1-13.
13. Liu, X., **Congress, S.S.C.**, Cai, G., Liu, L., Liu, S., Puppala, A. J., & Zhang, W. (2021). “Development and validation of a method to predict the soil thermal conductivity using thermal piezocone penetration testing (T-CPTU).” *Canadian Geotechnical Journal*, (ja).
14. Zhao, Z., **Congress, S.S.C.**, Cai, G., Duan, W. 2021. “Bayesian Probabilistic Characterization of Consolidation Behavior of Clays Using CPTU Data.” *Acta Geotechnica*.
15. Duan, W., **Congress, S.S.C.**, Cai, G., Puppala, A. J., Dong, X., & Du, Y. (2021). Empirical Correlations of Soil Parameters based on Piezocone Penetration Tests (CPTU) for Hong Kong-Zhuhai-Macau Bridge (HZMB) Project. *Transportation Geotechnics*, 100605.
16. Chen, R., **Congress, S.S.C.**, Cai, G., Duan, W., and Liu, S. (2021). “Sustainable Utilization of Biomass Waste-Rice Husk Ash as a New Solidified Material of Soil in Geotechnical Engineering: A review.” *Construction and Building Materials*. <https://doi.org/10.1016/j.conbuildmat.2021.123219>
17. Duan, W., **Congress, S.S.C.**, Cai, G., Liu, S., Dong, X., Chen, R., & Liu, X. (2021). “A hybrid GMDH neural network and logistic regression framework for state parameter-based liquefaction evaluation.” *Canadian Geotechnical Journal*, (ja).
18. Liu, L., Wu, R., **Congress, S.S.C.**, Du, Q., Cai, G. and Li, Z., (2021). “Design optimization of the soil nail wall-retaining pile-anchor cable supporting system in a large-scale deep foundation pit”. *Acta Geotechnica*, pp.1-24.
19. Wu, M., **Congress, S.S.C.**, Liu, L., Cai, G., Duan, W., & Chen, R. (2021). “Prediction of limit pressure and pressuremeter modulus using artificial neural network analysis based on CPTU data.” *Arabian Journal of Geosciences*, 14(1), 1-18.
20. 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*, p.03611981211001381.
21. Liu, X., Cai, G., **Congress, S.S.C.**, & Liu, L. (2021). “Thermomechanical Analysis of Fiber-Bentonite-Based Mixtures as Buffer Material in an Engineered Nuclear Barrier.” *Journal of Materials in Civil Engineering*, 33(2), 04020464.

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22. Chen, R., Cai, G., **Congress, S.S.C.**, Dong, X., & Duan, W. (2021). "Dynamic properties and environmental impact of waste red mud-treated loess under adverse conditions." *Bulletin of Engineering Geology and the Environment*, 80(1), 93-113.
23. **Congress, S.S.C.**, Puppala, A. J., Banerjee, A., and Patil, U. D. (2020). "Identifying Hazardous Obstructions within an Intersection Using Unmanned Aerial Data Analysis." *International Journal of Transportation Science and Technology*, Elsevier Publishers, <https://doi.org/10.1016/j.ijtst.2020.05.004>.
24. Banerjee, A., Puppala, A.J., **Congress, S.S.C.**, Chakraborty, S., Likos, W. L., Hoyos, L.R. (2020), "Variation of Resilient Modulus of Subgrade Soils Over a Wide Range of Suction States." *ASCE Journal of Geotechnical and Geoenvironmental Engineering*, October 2020, DOI: 10.1061/(ASCE)GT.1943-5606.0002332.
25. Talluri, N., Puppala, A., **Congress, S.S.C.**, & Banerjee, A. (2020). "Experimental Studies and Modeling of High-Sulfate Soil Stabilization." *ASCE Journal of Geotechnical and Geoenvironmental Engineering*, 146(5), 12. [https://doi.org/10.1061/\(ASCE\)GT.1943-5606.0002240](https://doi.org/10.1061/(ASCE)GT.1943-5606.0002240)
26. Liu, X., **Congress, S.S.C.**, Cai, G. and Liu, S., (2020). Performance evaluation of soil mixtures treated with graphite and used as barrier fill material for high-level radioactive waste repository. *Acta Geotechnica*, pp.1-21.
27. Liu, L., Li, Z., Cai, G., **Congress, S.S.C.**, Liu, X., & Dai, B. (2020). "Evaluating the influence of moisture on settling velocity of road embankment constructed with recycled construction wastes." *Construction and Building Materials*, 241, 117988.
28. Liu, X., Guojun, C., **Congress, S.S.C.**, Lulu, L., and Songyu, L. (2020). "Investigation of Thermal Conductivity and Prediction Model of Mucky Silty Clay." *Journal of Materials in Civil Engineering*, American Society of Civil Engineers, 32(8), 4020221. [https://doi.org/10.1061/\(ASCE\)MT.1943-5533.0003294](https://doi.org/10.1061/(ASCE)MT.1943-5533.0003294) (Featured on ASCE SmartBrief 2020)
29. Patil, U.D., Hoyos, L.R., Puppala, A.J., and **Congress, S.S.C.** (2020). "Suction Stress Characteristic Curves of Cohesive-frictional Soils from Multiple Suction-controlled Testing Methods." *ASCE International Journal of Geomechanics*, 2020, DOI: 10.1061/(ASCE)GM.1943-5622.0001698.
30. Cai, G., Liu, L, Liu. X., Li, X., Liu, S., Puppala, A.J., and **Congress, S.S.C.** (2020). "Prediction of Coefficient of Consolidation of Soil Using the Hyperbolic Fitting Method Based on Piezocone Penetration Test." *ASCE International Journal of Geomechanics*, DOI: 10.1061/(ASCE)GM.1943-5622.0001813.
31. Talluri, N., **Congress, S.S.C.**, Bheemasetti, T. V., Puppala, A. J., & Yu, X. (2020). "Assessment of Sulfate-Induced Heave in Chemically Treated Soils Using a Novel Hybrid Sensor." *ASTM Geotechnical Testing Journal*, 44(1), DOI 10.1520/GTJ20190196.
32. **Congress, S.S.C.**, and Puppala, A.J. (2020). "Evaluation of UAV-CRP Data for Monitoring Transportation Infrastructure Constructed over Expansive Soils." *Indian*

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Geotechnical Journal, Springer Publishers, April, 2020, 50 (2), pp. 159-171, doi.org/10.1007/s40098-019-00384-4.

33. Chen, R., Cai, G., **Congress, S.S.C.**, Dong, X., & Duan, W. (2020). “Dynamic properties and environmental impact of waste red mud-treated loess under adverse conditions.” *Bulletin of Engineering Geology and the Environment*, 1-21.
34. Yu, Q., Liu, J., Patil, U.D., **Congress, S.S.C.**, Puppala, A.J. (2019). “Two-Dimensional Fractal Model for Ultimate Crushing State of Coarse Aggregates.” *Fractals*, World Scientific Publishing Company, July 2019, DOI: 10.1142/S0218348X19501093 (in Press).
35. Puppala, A.J., Ruttanaporamakul, P., and **Congress, S.S.C.**, (2019). “Design and Construction of Lightweight EPS Geofoam Embedded Geomaterial Embankment System for Control of Settlements.” *Geotextiles and Geomembranes*, Elsevier Publishers, DOI: 10.1016/j.geotexmem.2019.01.015.
36. Puppala, A.J., **Congress, S.S.C.**, Talluri, N., and Wattanasanticharoen, E., (2019). “Sulfate Heaving Studies on Chemically Treated Sulfate Rich Geomaterials.” *Journal of Materials in Civil Engineering*, American Society of Civil Engineers, DOI: 10.1061/(ASCE)MT.1943-5533.0002729, Online Publication, March, 2019.
37. **Congress, S.S.C.**, Puppala, A.J., and Lundberg, C.L. (2018). “Total System Error Analysis of UAV-CRP Technology for Monitoring Transportation Infrastructure Assets.” *Engineering Geology*, Elsevier Publishers, December, 2018, doi.org/10.1016/j.enggeo.2018.11.002.
38. Puppala, A.J., Talluri, N., **Congress, S.S.C.**, Gaily, A. (2018). “Ettringite Induced Heaving in Stabilized High Sulfate Soils.” *Innovative Infrastructure Solutions*, Springer Publishers, 3:72. <https://doi.org/10.1007/s41062-018-0179-7>.
39. Puppala, A.J., **Congress, S.S.C.**, Bheemasetti, T., Caballero, S. R. (2018). “Visualization of Civil Infrastructure Emphasizing Geomaterial Characterization and Performance.” *Journal of Materials in Civil Engineering*, American Society of Civil Engineers, Volume 30, Issue 10, doi.org/10.1061/(ASCE)MT.1943-5533.0002434.

Refereed Conferences (30)

Papers in Press and Accepted for Publication

1. **Congress, S. S. C.**, and Puppala, A. J. (2022). “Lessons Learned in Airport Asset Inspection using Unmanned Aerial Vehicle (UAV) based Close-Range Photogrammetry.” International Conference on Transportation & Development, ASCE, Seattle, WA (accepted).
2. **Congress, S. S. C.**, Gajurel, A., and Puppala, A. J. (2022). “Evaluating the Influence of UAV Flight Characteristics on the Detection of Objects in Photogrammetric Models Using Deep Neural Networks.” International Conference on Transportation & Development, ASCE, Seattle, WA (accepted).
3. **Congress, S. S. C.**, Escamilla, J., Chimauriya, H., and Puppala, A. J. (2022). “Challenges of 360° Inspection of Bridge Infrastructure using Unmanned Aerial

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- Vehicles (UAVs).” International Conference on Transportation & Development, ASCE, Seattle, WA (accepted).
4. Kumar, P., Tingle, J. S., Puppala, A. J., Chakraborty, S., and **Congress, S. S. C.** (2022). Permeability Characteristics of Polymer Emulsion-Stabilized Soils. In *Geo-Congress 2022* (pp. 261-270).
 5. Khan, M. A., Puppala, A. J., Biswas, N., **Congress, S. S. C.**, & Jafari, K. H. An Analytical Approach to Estimate the Load-Bearing Capacity of Subgrade Soil with a Geocell-Reinforced Base Layer. In *Geo-Congress 2022* (pp. 380-389).
 6. Jang, J., Biswas, N., Puppala, A.J., **Congress, S. S. C.**, Radovic, M., and Huang, O., (2022). “Evaluation of Geopolymer for Stabilization of Sulfate-Rich Expansive Soils for Supporting Pavement Infrastructure.” In Transportation Research Board, 101 Annual Meeting. Washington, DC.
 7. Kumar, P., Puppala, A. J., Tingle, J. S., Chakraborty, S., and **Congress, S. S. C.** (2022). “Resilient Characteristics of Polymer Emulsion Treated Sandy Soil.” In Transportation Research Board, 101 Annual Meeting. Washington, DC.
 8. **Congress, S. S. C.**, Puppala, A. J., Gajurel, A., & Jafari, N. H. “Transforming Aerial Reconnaissance Data of Pavement Infrastructure into Knowledge for Better Response to Natural Disasters.” In *Geo-Extreme 2021* (pp. 183-193), American Society of Civil Engineers, Reston, VA.
 9. **Congress, S.S.C.**, Gajurel, A., Chimaurya, H., and Puppala, A. J. (2021). “A Review of the Applications of Artificial Intelligence Techniques in Geotechnical Engineering Disciplines.” Proceedings of the 20th International Conference on Soil Mechanics and Geotechnical Engineering, Sydney (accepted).
 10. **Congress, S.S.C.** and Puppala, A. J. (2021). “Digital Twinning for Transportation Infrastructure Asset Management using UAV Data,” ASCE International Conference on Transportation & Development (ICTD 2021), Proceedings, American Society of Civil Engineers, Reston, VA. <https://doi.org/10.1061/9780784483534.028>
 11. **Congress, S.S.C.**, Puppala, A. J., Kumar, P., and Patil, U. D. (2021). “Assessment of Pavement Geometric Characteristics using UAV-CRP Data,” ASCE International Conference on Transportation & Development (ICTD 2021), Proceedings, American Society of Civil Engineers, Reston, VA. <https://doi.org/10.1061/9780784483534.029>
 12. **Congress, S.S.C.**, Puppala, A. J., Khan, M. A., and Biswas, N. (2021). “Application of Unmanned Aerial Technologies for Inspecting Pavement and Bridge Infrastructure Asset Condition.” Centennial Paper, In Transportation Research Board, 100th Annual Meeting. Washington, DC. (accepted).
 13. Khan, M., Biswas, N., Banerjee, A., **Congress, S. S. C.**, & 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*, pp. 593-604. Springer, Cham.

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14. **Congress, S.S.C.**, Kumar, P., Gajurel, A., Patil, U. D., and Puppala, A. J. (2021). “Using Two- and Three-Dimensional Stability Analyses in Tandem to Evaluate the Safe Slope Angle of Rock Cut using Aerial Photogrammetry Data.” IFCEE 2021, Proceedings, American Society of Civil Engineers, Reston, VA (accepted).
15. Liu, L., **Congress, S.S.C.**, Cai, G., and Puppala, A. J. (2021). “Evaluating the Influence of Dynamic Compaction on Soft Soil Foundations Based on CPTu Testing.” IFCEE 2021, Proceedings, American Society of Civil Engineers, Reston, VA (accepted).
16. Kumar, P., Banerjee, A., **Congress, S.S.C.**, and Puppala, A. J. (2021). “Effect of Extreme Precipitation on Expansive Soil Embankments.” IFCEE 2021, Proceedings, American Society of Civil Engineers, Reston, VA (accepted).
17. **Congress, S.S.C.**, Kumar, P., Banerjee, A., Chakraborty, S., Patil, U. D., and Puppala, A. J. (2020). “Rock Slope Stability Analysis Using 3-Dimensional Data.” 2020 Tran-SET Conference, Proceedings, American Society of Civil Engineers, Reston, VA (in press).
18. Ulloa H., **Congress, S.S.C.**, Lei, G., Yu, X., Jafari, N., and Puppala, A. J. (2020). “Comprehensive Slope Stability Analysis of a Failed Roadway Embankment.” 2020 Tran-SET Conference, Proceedings, American Society of Civil Engineers, Reston, VA (in press).
19. **Congress, S.S.C.**, Kumar, P., Patil, U. D., Bheemasetti, T. V., & Puppala, A. J. (2020). “Three-Dimensional Stability Analysis of Rock Slope Using Aerial Photogrammetry Data.” Geo-Congress 2020. American Society of Civil Engineers, Reston, VA. <https://doi.org/doi:10.1061/9780784482810.041>
20. **Congress, S.S.C.**, and Puppala, A. J. (2019). “Innovative Monitoring of Pavements on Expansive Soils Using Aerially Collected Data from UAV-CRP Technology.” In Transportation Research Board, 98th Annual Meeting. Washington, DC.
21. Talluri, N., Puppala, A. J., Bheemasetti, T. V., and **Congress, S.S.C.**, (2019). “Assessment of Sulfate Heaving in Stabilized Soils by Time Rate Monitoring of Moisture Content and Stiffness Properties.” In Transportation Research Board, 98th Annual Meeting. Washington, DC.
22. Morvan, M., Patil, U., Hoyos, L.R., Puppala, A.J., **Congress, S.S.C.** “Modeling Unsaturated Soil Response Beyond Residual Suction State via Vapor Pressure Controlled Triaxial Testing,” E-Unsat 2020, Lisbon, Portugal (in press).
23. **Congress, S.S.C.**, and Puppala, A. J. (2019). “Novel Methodology of Using Aerial Close Range Photogrammetry Technology for Monitoring the Pavement Construction Projects.” Airfield and Highway Pavements 2019, Proceedings.
24. **Congress, S.S.C.**, Puppala, A. J., Banerjee, A., Jafari, N. H., & Patil, U. D. (2019). “Use of Unmanned Aerial Photogrammetry for Monitoring Low-Volume Roads After Hurricane Harvey.” In 12th International Conference on Low-Volume Roads (p. 530).

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25. Patil, U. D., Hoyos, L. R., Yepes, J. E., Puppala, A. J., & **Congress, S.S.C.** (2019). “Suction stress via thermo-servo/constant-water content ring shear testing.” Japanese Geotechnical Society Special Publication, 7(2), 110-114.
26. Puppala, A.J., and **Congress, S.S.C.** (2019). “Advanced Methodologies to Study Problematic Soils Under Transportation Infrastructure.” International Conference on Geotechnics for High-Speed Corridors (GHC 2019), July 24-27, 2019, Trivandrum, India.
27. Patil, U.D., Hoyos, L.R., Puppala, A.J., **Congress, S.S.C.**, Banerjee, A. (2019). “Suction Stress Characteristic Curve for Compacted Silty Sand from Suction-Controlled Triaxial Testing.” Proceedings of the XVI Pan-American Conference on Soil Mechanics and Geotechnical Engineering (XVI PCSMG), Geotechnical Engineering in the XXI Century: Lessons Learned and Future Challenges, N.P. López-Acosta et al. (Eds.), Pages 756-763, 17-20 November 2019, Cancun, Mexico, doi: 10.3233/STAL190109
28. He, S., **Congress, S.S.C.**, Yu, X., Chakraborty, S., and Puppala, A.J. (2019). “Non-Conventional Stabilization to Improve the Stiffness of Expansive Soil Supporting Pavement Infrastructure in Texas.” International Conference on Transport Infrastructure and Sustainable Development (TISDIC 2019), Da Nang, Vietnam, Aug 31 – Sept 1, 2019.
29. Puppala, A.J., **Congress, S.S.C.**, Bheemasetti, T. V, and Caballero, S. (2018). “Geotechnical Data Visualization and Modeling of Civil Infrastructure Projects.” In: GeoShanghai International Conference. Springer, 1–12.
30. Puppala, A. J., Das, J. T., Bheemasetti, T. V., & **Congress, S.S.C.** (2018). “Sustainability and Resilience in Transportation Infrastructure Geotechnics: Integrating Advanced Technologies for Better Asset Management.” Geo-Strata—Geo Institute of ASCE, 22(3), 42-48.

PRESENTATIONS

Invited Presentations, Lectures and Seminars in USA, China, India, Egypt, Vietnam, and Paraguay (32)

1. “Applications of Unmanned Aerial Vehicles-based Close-Range Photogrammetry (UAV-CRP) Technology for Rail Safety,” Presentation, Technical Session: UAS (Drones): Practical Applications for Railroad Safety Assurance, April 5-7, 2022, Federal Railroad Administration’s (FRA’s) Track & Railroad Workplace Safety Symposium, St. Louis, MO.
2. “Resilient Characteristics of Polymer Emulsion Treated Sandy Soil,” Presentation, Technical Session: Resiliency and Sustainability in Stabilization, Jan 8-13, 2022, Transportation Research Board, 101 Annual Meeting, Washington, DC.
3. “Application of using unmanned aerial vehicles (UAVs) for monitoring slopes,” Poster Session: Young Researchers' Work in Geology and Geotechnical Engineering, Jan 8-13, 2022, Transportation Research Board, 101 Annual Meeting, Washington, DC.

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4. “Transforming Aerial Reconnaissance Data of Pavement Infrastructure into Knowledge for Better Response to Natural Disasters,” Presentation, Technical Session: Instrumentation and Remote Sensing of Extreme Events and Their Impacts, November 8-10, ASCE Geo-Extreme 2021, Savannah, Georgia.
5. “Digital Twinning for Transportation Infrastructure Asset Management using UAV Data,” Presentation, Technical Session: UAVs, June 8-10, ASCE International Conference on Transportation & Development (ICTD) 2021, Austin, Texas.
6. “Assessment of Pavement Geometric Characteristics using UAV-CRP Data,” Presentation, Technical Session: UAVs, June 8-10, ASCE International Conference on Transportation & Development (ICTD) 2021, Austin, Texas.
7. “Unmanned Aerial Inspection of Pavement Infrastructure Assets,” Invited Lecture, Short-term Course on Advances in Pavement Engineering, May 24, 2021, Organized by School of Infrastructure, IIT Bhubaneswar.
8. “Using Two- and Three-Dimensional Stability Analyses in Tandem to Evaluate the Safe Slope Angle of Rock Cut using Aerial Photogrammetry Data,” Presentation, Technical Session: Case Studies, May 10-14, Geo-Congress, IFCEE 2021, Dallas, Texas.
9. “Evaluating the Influence of Dynamic Compaction on Soft Soil Foundations Based on CPTu Testing,” Presentation, Technical Session: Ground Improvement for Seismic Reinforcement, May 10-14, Geo-Congress, IFCEE 2021, Dallas, Texas.
10. “Case Studies: Applications of Unmanned Aerial Vehicles for Monitoring Geotechnical Assets,” Invited presentation in a [Webinar](#) on The Ubiquitous Unmanned Aerial Vehicle – UAVs for Infrastructure Monitoring, Sponsored by Standing Committee on Geotechnical Instrumentation and Modeling (AKG60), March 16th, TRB-2021, Washington, DC.
11. “Aerial Inspection of Low-Volume Road Conditions,” Invited presentation in a Workshop on New Developments in Safety on Low Volume Roads, Sponsored by Standing Committee on Low-Volume Roads (AKD30), January 22, TRB-2021, Washington, DC.
12. “Novel Approach for Monitoring Transportation Infrastructure Assets Using UAV-CRP Technology,” [Invited Presentation](#), DJI AirWorks 2020, August 28.
13. “Transportation Infrastructure Asset Monitoring Using UAV-CRP Technology,” [Invited Presentation](#), Commercial UAV Expo Americas 2020, September 16.
14. “Rock Slope Stability Analysis Using 3-Dimensional Data,” 2020 Tran-SET Conference, September 2.
15. “Comprehensive Slope Stability Analysis of a Failed Roadway Embankment,” 2020 Tran-SET Conference, September 2.

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16. “Three-Dimensional Stability Analysis of Rock Slope Using Aerial Photogrammetry Data,” Podium Presentation, Technical Session: Rock Mechanics, February 27, Geocongress 2020, Minnesota, Minneapolis.
17. “Infrastructure Inspection: Complimenting Traditional Methods with Aerial Remote Sensing,” Invited Presentation, Integration of Remote Sensing Techniques and Classical Instrumentation, January 12th - 16th, TRB-2020, Washington, DC.
18. “A Novel Approach of Monitoring Infrastructure Asset Condition using Aerial Sensors,” Invited presentation, Young Geotechnical Professionals in Transportation, January 12th - 16th, TRB-2020, Washington, DC.
19. “Novel Infrastructure Monitoring Using Multifaceted Unmanned Aerial Vehicle Systems -Close Range Photogrammetry (UAV -CRP) Data Analysis,” [Congresode Suelos Dispersivos y Sulfatados 2019](#), Asuncion, Paraguay.
20. “Monitoring Stabilized pavements using novel sensors to validate the performance improvement,” International Conference on Transport Infrastructure and Sustainable Development (TISDIC 2019), Da Nang, Vietnam, Aug 31 – Sept 1, 2019.
21. “Sustainable Design and Monitoring of Transportation Infrastructure using Proactive Data Collection,” International Conference on Geotechnics for High Speed Corridors (GHC 2019), July 24-27, 2019, Trivandrum, India.
22. “Infrastructure Monitoring Using Multifaceted UAV-CRP Data Analysis,” Invited presentation, Eye in Sky: Transportation Infrastructure Monitoring Using Unmanned Aerial Technologies, January 13th - 17th, TRB-2019, Washington, DC.
23. “Innovative Monitoring of Pavements on Expansive Soils Using Aerially Collected Data from UAV-CRP Technology,” paper presentation, Recent Advances in Geospatial Data Acquisition, January 13th - 17th, TRB-2019, Washington, DC.
24. “Unmanned Aerial Vehicle (UAV) Technology with Photogrammetry in Several Application Areas,” Bright Spark Lecture, GeoMEast 2018, Cairo, Egypt.
25. “UAV and Close Range Photogrammetry (CRP) Studies for Transportation Infrastructure Surveys and Condition Assessment,” MnDOT Research Pays Off webinar series, Sept 18, 2018, Minnesota.
26. “Analysis and interpretation of inclinometer and pressure cell data on a soil-geofam embankment,” GeoShanghai, Shanghai, China, May 27-30, 2018.
27. “Evaluation of Initial Applications of UAVs for Monitoring TxDOT Infrastructure,” TxDOT Surveyors’ Conference, April 24-25, 2018, Austin, Texas.
28. “Implementation of Unmanned Aerial Systems in Texas,” State Transportation Innovation Council, March 5th 2018, Austin, Texas.
29. “UAV Studies in Transportation and Geotechnical Applications,” AFS 20 Committee Presentation, January 7th - 11th, TRB-2018, Washington, DC.

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30. “Applications of UAVs in Transportation Geotechnics,” Invited Presentation, January 7th - 11th, TRB-2018, Washington, DC.
31. “UAV Studies: Texas DOT Experience: Safety Protocols and Applications in Transportation, Pavement, and Bridge Infrastructure,” Invited Presentation, January 7th - 11th, TRB-2018, Washington, DC.
32. “Drone data collection to monitor the health of civil infrastructure in Texas including post recent hurricanes,” [Invited Talk](#), CityAge: The New American City, November 29th - 30th, 2017 in Washington, DC.

GRANTS

Research Grants

Worked on state and federally funded projects worth more than \$2.6 Million out of which I am the PI and Co-PI on projects totaling nearly \$1.8 Million.

TAMU

1. Federal Railroad Administration, “Improving the Safety at Highway Railroad Grade Crossings Located in Rural Areas Using UAV-CRP Data Analysis.” Sep 2021 to July 2023, PI: **Surya S.C. Congress** and Co-PI: Anand Puppala.
2. Transportation Consortium of South-Central States (Tran-SET), “Stabilization of expansive soil using geopolymers from locally available resources.” May 2022 to December 2023, PI: **Surya S.C. Congress** and Co-PI (s): Anand Puppala & Miladin Radovic. (Under awarding process)
3. Alaska DOT, “UAV Based Inspections for Highway Bridge and Structural Condition Monitoring and Inspection Works.” February 2021 to February 2023, PI: Anand Puppala and Co-PI: **Surya S.C. Congress**.
4. Transportation Consortium of South-Central States (Tran-SET), “Mining of Unmanned Aerial System Operations and Data to Improve Emergency Operations during Natural Disasters.” August 2020 to February 2022, PI: Anand Puppala and Co-PI: **Surya S.C. Congress**.
5. Thermafoam - NSF IUCRC, “Application of Geofoam for Thermal Encapsulation of Foundations.” August 2020 to September 2022, PI: Anand Puppala and Co-PI: **Surya S.C. Congress**.
6. Warstone Innovations – NSF IUCRC, “Evaluation of Fiber-based Cement mix for controlling Erosion.” July 2021 to September 2022, PI: Anand Puppala and Co-PI: **Surya S.C. Congress**.
7. National Science Foundation (NSF) – Industry/Government Agency Funding Support for NSF IUCRC. “Phase III I/UCRC Center for Integration of Composites into Infrastructure (CICI) Texas A&M University Site.” November 2019 to November 2024, PI: Anand Puppala and Co-PI: **Surya S.C. Congress**.

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8. Tarrant Regional Water District (TRWD), “Aerial Inspection of Dam and Structural Elements.” September 2019 to March 2022, PI: Anand Puppala and Co-PI: **Surya S.C. Congress.**
9. National Science Foundation (NSF), “Collaborative Research: Data Mining and Fusion between Unmanned Aerial Systems and Social Media Technologies to Improve Emergency Operations.” October 2019 to September 2021, PI: Anand Puppala and Co-PI: **Surya S.C. Congress.**
10. Center for Transportation, Equity, Decisions and Dollars (CTEDD), “Transportation Communication Tower Inspection Using Novel UAV Technologies,” September 2019 to August 2021, PI: Anand Puppala and Co-PI: **Surya S.C. Congress.**
11. Transportation Consortium of South-Central States (Tran-SET), “Coupling Novel Soil Moisture-Suction Sensors and UAV Photogrammetry Technology to the Performance of Highway Embankments.” August 2019 to August 2021, PI: Anand Puppala and Co-PI: **Surya S.C. Congress.**

UT Arlington

12. Texas Department of Transportation (TxDOT), “Department of TxDOT UAS Flight Operations Manual, Policy Recommendations, and Initial Application Evaluations.” Nov 2016 to April 2018, PI: Anand Puppala and Researcher: **Surya S.C. Congress.**
13. Texas Department of Transportation (TxDOT), “Implementation of Unmanned Aerial Systems using close-range photogrammetry techniques (UAS-CRP) for quantitative (measuring) and qualitative (inspection) tasks related to roadway assets and infrastructure.” September 2018 to February 2019, PI: Anand Puppala and Researcher: **Surya S.C. Congress.**
14. Center for Transportation, Equity, Decisions and Dollars (CTEDD), “Evaluation of Pavement Performance Using Remote Sensing Techniques.” September 2017 to February 2019 PI: Anand Puppala and Researcher: **Surya S.C. Congress.**
15. National Science Foundation (NSF), “Collaborative: Data Driven Post-Disaster Waste and Debris Volume Predictions using Smartphone Photogrammetry App and Unmanned Aerial Vehicles.” October 2017 to September 30, 2018, PI: Anand Puppala and Researcher: **Surya S.C. Congress.**
16. Center for Transportation, Equity, Decisions and Dollars (CTEDD), “Multi-Criteria decision-making approach for Building Resilient and Sustainable Transportation Infrastructure.” November 2018 to October 2019, PI: Anand Puppala and Researcher: **Surya S.C. Congress.**
17. Harris County Toll Road Authority (HCTRA), “UAV – Photogrammetry studies on HCTRA infrastructure assets for condition assessment: phase I.” November 2018 to August 2019, PI: Anand Puppala and Researcher: **Surya S.C. Congress.**

Professional and Technical Organizations and Activities:

- Associate Member, American Society of Civil Engineers (ASCE), Current

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- Member, National Academy of Sciences, National Research Council, Transportation Research Board

Professional and Technical Committees and Activities:

- American Society of Civil Engineers or ASCE
- ASCE Geo Institute (GI) – Committee on Innovative Technologies and Tools in Geotechnical Engineering (INNC)

Transportation Research Board, National Research Council, National Academy of Sciences (Member in 2 National Committees):

- TRB Committee Communications Coordinator (CCC) and Committee Member, AKG60, Committee on Geotechnical Instrumentation and Modeling, Transportation Research Board, National Research Council, National Academy of Sciences, (2018 – present)
- Committee Member, AKG50, Committee on Transportation Earthworks, Transportation Research Board, National Research Council, National Academy of Sciences, (2018 – present)

Paper Review Activities (Reviewer of Manuscripts)

- ASCE Journal of Materials
- ASTM Geotechnical Testing Journal
- Engineering Geology
- Transportation Geotechnics
- Transportation Research Record
- ICE Ground Improvement Journal
- ASCE GI Conferences

Honor Societies

- Chi Epsilon (Civil Engineering)

AWARDS, HONORS & RECOGNITIONS

- Our paper “*Experimental Studies and Modeling of High Sulfate Soil Stabilization*” published in the Journal of Geotechnical and Geoenvironmental Engineering was nominated for both ASCE’s Norman Medal 2020 and Arthur M. Wellington Prize 2020.
- Our paper “*Investigation of Thermal Conductivity and Prediction Model of Mucky Silty Clay*” published in ASCE Journal of Materials featured on ASCE SmartBrief 2020
- Outstanding Graduate Student Award, UT Arlington 2018
- Young Geotechnical Engineers Bright Spark Lecture 2018 Awardee, GeoMEast 2018, Cairo, Egypt

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- “NBC Interview on Local News: UTA Researchers use Drones to Help Harvey Cleanup Efforts” Coverage on the research work during Hurricane Harvey, 2017.
- “ABC Interview on Local News: UTA using drones to help cities after natural disasters” Coverage on the research work during Hurricane Harvey, 2017.
- Vidya and A. Kumar Palaniappan/Terradyne Endowed Fellowship 2017 Awardee
- Best Teacher of the Year, GIER 2015
- DAAD IIT-Master Sandwich Scholarship 2013 Awardee, Assistance towards master’s thesis program at TU Darmstadt, Germany