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CONTACT INFORMATION

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PERMANENT ADDRESS

14/12, 34th Street,
Nanganallur,
Chennai-600 061, India

EDUCATION

Doctor of Philosophy in Civil Engineering Texas A&M University, College Station, Texas	2013
Bachelor of Technology in Civil Engineering Indian Institute of Technology Madras, Chennai, India	2007

PROFESSIONAL EXPERIENCE

Assistant Professor Indian Institute of Technology Madras, India	2014-Present
Visiting Assistant Professor Indian Institute of Technology Madras, India	2013-2014

RESEARCH INTERESTS

Constitutive modeling
Material characterization
Viscoelasticity
Bituminous materials
Cement paste
Granular materials

GRANTS

1. "Relationship between the mechanical behaviour of bituminous concrete and that of its constituents", *IIT Madras, 2014-2017, Value: ₹25,00,000.*
2. "Investigation on the Laboratory Performance of Bitumen Modified with SBS, Elvaloy and Lotader", *Total Oil India, Ltd., 2014-2016, Value: ₹16,00,000.*
3. "Experimental Investigation of Dissipation Associated with Fatigue Cracking in Bituminous Mixtures", *Science and Engineering Research Board, India, 2016-2019, Value: ₹36,00,000.*
4. "Indigenous development of Cement Asphalt Mortar (CAM) for high speed railway track", *National High Speed Railway Corporation Limited, 2020-Present, Value: ₹60,00,000* (With Prof. Manu Santhanam, Prof. Murali Krishnan, and Prof. Subhadeep Banerjee as Co-Principal Investigators)

PUBLICATIONS

Refereed Journal Publications

1. SP Atul Narayan, JM Krishnan, AP Deshpande, and KR Rajagopal. Nonlinear viscoelastic response of asphalt binders: An experimental study of the relaxation of torque and normal force in torsion. *Mechanics Research Communications*, 43:66–74, 2012.
2. SP Atul Narayan, KAV Nag, JM Krishnan, AP Deshpande, and KR Rajagopal. Nonlinear viscoelastic response of asphalt binders in transient tests. *Road Materials and Pavement Design*, 13(1):191–202, 2012.
3. SP Atul Narayan, DN Little, and KR Rajagopal. Nonlinear viscoelastic model for describing the response of asphalt binders within the context of a Gibbs-potential-based thermodynamic framework. *Journal of Engineering Mechanics*, 141(2):04014116, 2013.
4. SP Atul Narayan and KR Rajagopal. Unsteady flows of a class of novel generalizations of the Navier–Stokes fluid. *Applied Mathematics and Computation*, 219(19):9935–9946, 2013.
5. SP Atul Narayan, DN Little, and KR Rajagopal. Analysis of rutting prediction criteria using a nonlinear viscoelastic model. *Journal of Materials in Civil Engineering*, 27(3):04014137, 2014.
6. SP Atul Narayan, DN Little, and KR Rajagopal. Modelling the nonlinear viscoelastic response of asphalt binders. *International Journal of Pavement Engineering*, 17(2):123–132, 2016.
7. SP Atul Narayan, J Murali Krishnan, DN Little, and KR Rajagopal. Mechanical behaviour of asphalt binders at high temperatures and specification for rutting. *International Journal of Pavement Engineering*, 18(10):916–927, 2017.
8. SP Atul Narayan, DN Little, and KR Rajagopal. Incorporating disparity in temperature sensitivity of asphalt binders into high-temperature specifications. *Journal of Materials in Civil Engineering*, 31(1):04018343, 2018.
9. MR Nivitha, SP Atul Narayan, and J Murali Krishnan. Non-linear viscoelastic model based ranking of modified binders for their rutting performance. *Materials and Structures*, 51(4):105, 2018.
10. R Gupta and SP Atul Narayan. Tensile creep of asphalt concrete in repeated loading tests and its effect on energy dissipation. *International Journal of Pavement Engineering*, pages 1–13, 2019.
11. R Varma, SP Atul Narayan, and J Murali Krishnan. Quantification of viscous and fatigue dissipation of asphalt concrete in four-point bending tests. *Journal of Materials in Civil Engineering*, 31(12):04019285, 2019.
12. BS Abhijith and SP Atul Narayan. Evolution of the modulus of asphalt concrete in four-point beam fatigue tests. *Journal of Materials in Civil Engineering*, 32(10):04020310, 2020.
13. PK Athira, SP Atul Narayan, J Murali Krishnan, and PK Jain. Comparison of binder and mixture tests to characterize permanent deformation of elastomer and terpolymer modified binders. *Construction and Building Materials*, 264:120138, 2020.
14. SP Atul Narayan and LI Palade. Comparison of a natural configuration approach and a structural parameter approach to model the Payne effect. *Acta Mechanica*, pages 1–22, 2020.
15. SP Atul Narayan and LI Palade. Modelling Payne effect with a framework of multiple natural configurations. *International journal of engineering science (Accepted)*, 2020.
16. SP Atul Narayan and KR Rajagopal. A constitutive model for wet granular materials. *Particulate Science and Technology*, 2020.

17. SP Atul Narayan and KR Rajagopal. Some remarks on the equilibrium of granular materials described by constitutive relations that depend on the gradients of the density or volume fraction. *Journal of Engineering Materials and Technology*, 142(4), 2020.
18. A Perilakalathil and SP Atul Narayan. Relationship between nonlinear viscoelastic behaviour of asphalt binders and deformation of mixtures. *International Journal of Pavement Engineering*, pages 1–11, 2020.
19. AV Rahul, SP Atul Narayan, N Neithalath, and M Santhanam. A thermodynamic framework for modelling thixotropic yield stress fluids: Application to cement pastes. *Journal of Non-Newtonian Fluid Mechanics*, page 104318, 2020.
20. BS Abhijith and SP Atul Narayan. Harmonic analysis of four-point beam fatigue tests of asphalt concrete. *International Journal of Pavement Engineering (Under review)*, 2021.
21. K Kavinmathi, SP Atul Narayan, and SC Subramaniam. Lateral load transfer in vehicles on horizontal curves and its impact on pavement distresses. *Road Materials and Pavement Design (Under review)*, 2021.

Conference Publications

1. Rajneesh Gupta and SP Atul Narayan. Estimation of viscous and fatigue dissipation of bituminous concrete in repeated loading tests. In *Proceedings of the 4th Chinese-European Workshop on Functional Pavement Design, Delft, The Netherlands*. CRC Press, 2016.
2. Agmodhu Mathruswamy, PK Athira, and SP Atul Narayan. Compressible behavior of bituminous mixtures in creep recovery test in confinement. In *Proceedings of the 4th Chinese-European Workshop on Functional Pavement Design, Delft, The Netherlands*. CRC Press, 2016.
3. BS Abhijith and SP Atul Narayan. Fatigue evaluation tests for asphalt binders and instabilities in torsional flows. In *International Conference on Advances in Construction Materials and Systems*, page 371. RILEM Publications, 2017.
4. K Kavinmathi and SP Atul Narayan. Effect of fluid-like characteristics of bituminous layers and inertia on the rutting behaviour of flexible pavements. In *International Conference on Advances in Construction Materials and Systems*, page 563. RILEM Publications, 2017.
5. SP Atul Narayan and Rajneesh Gupta. Frequency of fatigue tests and decay of modulus of asphalt concrete. In *Advances in Materials and Pavement Prediction: Papers from the International Conference on Advances in Materials and Pavement Performance Prediction (AM3P 2018), April 16-18, 2018, Doha, Qatar*, page 117. CRC Press, 2018.
6. K Kavinmathi, SP Atul Narayan, J Murali Krishnan, and Shankar C Subramanian. Investigation of dynamic vehicle loading due to roughness of pavement—a case study. In *Advances in Materials and Pavement Prediction: Papers from the International Conference on Advances in Materials and Pavement Performance Prediction (AM3P 2018), April 16-18, 2018, Doha, Qatar*, page 281. CRC Press, 2018.
7. M Chauhan and SP Atul Narayan. Effect of moisture on fatigue characteristics of asphalt concrete mixtures. In *International Symposium on Asphalt Pavement & Environment*, pages 356–366. Springer, 2019.
8. D Gumare and SP Atul Narayan. Effect of temperature on the work of cohesion and work of adhesion of asphalt binders using a sessile drop apparatus. In *5th Conference of Transportation Research Group of India*. CTRG, 2019.
9. K Kavinmathi and SP Atul Narayan. Viscoelastic response of asphalt pavements subjected to dynamic loading. In *Airfield and Highway Pavements 2019: Design, Construction, Condition Evaluation, and Management of Pavements*, pages 101–110. American Society of Civil Engineers Reston, VA, 2019.
10. BS Abhijith, SP Atul Narayan, and J Murali Krishnan. Influence of confinement pressure on the viscoelastic response of bituminous mixtures. In *RILEM International Symposium on Bituminous Materials*. RILEM, 2020.

THESIS SUPERVISION

Doctoral Students

1. A. V. Rahul (2019, Co-guided)
2. P. K. Athira (Current)
3. K. Kavinmathi (Current)
4. B. S. Abhijith (Current)
5. V. Navjot (Current)

Master of Science Students

1. M. Chauhan (2020)
2. Darshika Gumare (Current)
3. T. Divya Darsini (Current)
4. M. K. Aravind (Current)

Master of Technology Students

1. R. Gupta (2015)
2. A. Mathruswamy (2015)
3. A. Paul (2018)

Bachelor of Technology Students

1. A. Dande (2016)
2. B. G. V. Puneeth (2016)
3. V. Arjun (2017)

COURSES INSTRUCTED

Undergraduate level

1. ME1120 - Engineering Drawing
2. CE2080 - Surveying
3. CE3010/CE3015 - Transportation Engineering I / Highway Engineering
4. CE3410 - Construction Materials Laboratory

Postgraduate level

1. CE5800 - Pavement Analysis and Design
2. CE5831 - Transportation Engineering Design Studio
3. CE5850 - Pavement Materials and Evaluation Laboratory
4. CE7620 - Rheology of Civil Engineering Materials

Continuing Education

1. AICTE STTP/QIP course on "Rutting and Fatigue Cracking of Bituminous Pavements", 2016, Coordinated along with Prof. J. Murali Krishnan

PROFESSIONAL SERVICE

Editorial Board Member

1. International Journal of Pavement Engineering

Journal Reviewer

1. International Journal of Pavement Engineering
2. ASCE Journal of Materials in Civil Engineering
3. Acta Mechanica
4. Road Materials and Pavement Design
5. Journal of the Institute of Engineers (India): Series A
6. Transportation in Developing Economies
7. Sadhana