AI in Asphalt Technology - An Introductory Workshop

Dates: Monday August 24 - Wednesday August 26, 2026 (2.5 day workshop)

Format: Virtual

Instructor: Dr. Raj Dongre; Organized by Western Research Institute

Tentative Agenda*

*(*subject to some modifications based on request/communication from attendees regarding any particular technical aspects they want to be covered)*

Day 1: AI Fundamentals and Data for Asphalt Technology

Focus: Establishing a common language, understanding how AI works, and preparing asphalt data for modeling.

Module Title	**Key Learning Goals Addressed**
AI Fundamentals	
Module 1: AI Demystified	Introduction to AI, ML, and Deep Learning; **Understanding how AI functions** and analyzes data.
Break	
Module 2: The Role of Data in AI for Asphalt	Data requirements for robust models; **Incorporating science** and domain knowledge into AI models; Data cleaning and feature engineering specific to asphalt properties.
Model Design	
Module 3: Foundational AI Model Types	Overview of Supervised vs. Unsupervised Learning; Introduction to Regression (Predictive Models) and Classification (Categorization) relevant to asphalt testing.
Break	
Module 4: Model Training and Evaluation	**How to design AI** models; Introduction to training, testing, and validation sets; Understanding key performance metrics and **knowing when to question AI** results.
Q&A and Day 1 Wrap-up	

Day 2: Core Applications and Case Studies

Focus: Deep dive into the top three requested application areas and practical examples.

Module Title	Key Learning Goals Addressed
Material & Mix Design	
Module 5: AI for Material Characterization	Using AI for **physical & compositional properties of asphalt** and modifiers; Enhancing binder rheology evaluation and distress classification.
Break	
Module 6: Optimized Asphalt Mix Design	Hands-on examples of using AI to **design and optimize asphalt mixtures**; Improving mixture design efficiency (a high-priority topic).
Break	
Pavement Performance & Efficiency	
Module 7: Pavement Performance Prediction	Using ML for **pavement performance prediction**; **Real-time pavement evaluation** using AI; Case studies in failure prediction.
Break	
Module 8: Efficiency and Workflow Case Studies	Practical examples for **efficiency in DOT workflows, research, or lab testing environments**; Examples for field operations and decision-making in public infrastructure.
Q&A and Day 2 Wrap-up	

Day 3 (Half Day): Tools, Strategy, and Future Outlook

Focus: Practical tools, organizational strategy, and industry trends.

Module Title	Key Learning Goals Addressed
Implementation & Strategy	
Module 9: AI Tools for Asphalt Engineers	Introduction to specific **commercially available applications** and coding-free tools (e.g., specialized platforms, AutoML) **other than ChatGPT**; Tools for efficient processes.
Break	
Module 10: AI Adoption and Future Trends	**Organizational Assessment: Finding out what others are considering when implementing AI tools**; Current status, trends, and the 1-to-5-year outlook for AI in the road industry; Practical steps to **adopt AI for R&D**.
Closing Remarks & Workshop Conclusion	