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**INTERESTS AND EXPERTISE**

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- Material characterization, design and modeling of asphalt pavements
- Pavement design, analysis and modeling
- Applications of 3D (X-ray CT) and 2D imaging techniques to pavement and geotechnical engineering
- Granular mechanics (micromechanical modeling techniques, Dissipative Particle Dynamics (DPD)), modeling saturated and unsaturated fluid flow through geomaterials.

**EDUCATION**

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<b>2005</b>	<b>Ph.D., University of Maryland-College Park, Civil &amp; Environmental Engineering</b>
<b>2002</b>	<b>M.S., University of Maryland-College Park, Civil &amp; Environmental Engineering</b>
<b>2001</b>	<b>B.S., Middle East Technical University, Ankara-Turkey, Civil Engineering</b>

**PROFESSIONAL EXPERIENCE**

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<b>07/2014 - present</b>	<b>Associate Professor, Michigan State University, East Lansing, MI</b> <i>(08/2016 – present: Associate Chair for Graduate Studies)</i>
<b>8/ 2008 – 7/2014</b>	<b>Assistant Professor, Michigan State University, East Lansing, MI</b>
<b>9/ 2006 – 8/2008</b>	<b>Senior Laboratory Manager, SES Group, Turner-Fairbank Highway Research Center, Federal Highway Administration (FHWA), McLean, VA</b>
<b>9/ 2005 – 9/2006</b>	<b>Research Engineer, SES Group, Turner-Fairbank Highway Research Center, Federal Highway Administration (FHWA), McLean, VA</b>
<b>9/ 2003 – 9/ 2005</b>	<b>Eisenhower Graduate Research Fellow, Turner-Fairbank Highway Research Center, Federal Highway Administration (FHWA) , McLean, VA</b>
<b>1/ 2005 – 5/2005</b>	<b>Teaching Assistant / Lecturer, Department of Civil &amp; Environmental Engineering, University of Maryland, College Park, MD</b>
<b>5/ 2003 – 9/2003</b>	<b>Geotechnical Staff Engineer, Soil Consultants Inc., Manassas, VA</b>
<b>9/ 2001 – 9/2003</b>	<b>Graduate Research Assistant, Department of Civil &amp; Environmental Engineering, University of Maryland, College Park, MD</b>
<b>9/2001 – 5/2002</b>	<b>Teaching Assistant, Department of Civil &amp; Environmental Engineering, University of Maryland, College Park, MD</b>

**Summers of 1998, Internship, Geo-Tech C.O., Ankara, Turkey.  
1999 and 2000**

## **PROFESSIONAL LICENSURE**

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*Registered professional engineer (PE): Commonwealth of Virginia*

## **AWARDS AND HONORS**

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- 2015**      **William A. Bradley award for Outstanding Faculty Member** (from ASCE MSU Student Chapter)
- 2009**      **ASCE Arthur M. Wellington Prize**
- 2009**      **Association of Asphalt Paving Technologists (AAPT) Walter J. Emmons Award** for the best paper presented at the April 2008 Annual Meeting held in Philadelphia, PA for the following paper: Kutay, M.E., Gibson, N.H. and Youtcheff, J. (2008) "Conventional and Viscoelastic Continuum Damage (VECD) based Fatigue Analysis of Polymer Modified Asphalt Pavements", *Journal of the Association of Asphalt Paving Technologists*, Vol. 77, pp. 395-434.
- 2008**      **ASCE Collingwood Prize** for the following paper: Kutay, M.E., and Aydilek, A.H. (2007) "Dynamic Effects on Moisture Transport in Asphalt Concrete", *ASCE Journal of Transportation Engineering*, Vol. 133, No. 7, July 2007, pp. 406-414.
- 2007**      **AASHTO National Competition Award** for Transportation Professionalism for representing United States in the World Road Association PIARC Prizes 2007 international competition
- 2003-2005**      **Eisenhower Graduate Research Fellowship** from the U.S. Department of Transportation, Federal Highway Administration

## **RESEARCH FUNDING**

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### **Projects Awarded**

<b>Project Title</b>	<b>Total Award</b>	<b>Effort Credit to Dr. Kutay (PI/Co-PI)</b>	<b>Sponsor</b>	<b>Status **</b>
<i>Use of De-Vulcanized CRM Emulsion In Chip Seal Projects (2016-2017)</i>	\$458,716	\$458,716 (PI)	Michigan Department of Environmental Quality (MDEQ)	A
<i>Evaluation of De-Vulcanized Rubber (DVR) Modified Hot Mix Asphalt (HMA) Pavement (2015-2016)</i>	\$300,000	\$300,000 (PI)	Michigan Department of Environmental Quality (MDEQ)	A

<i>Development of an Acceptance Test for Chip Seal Projects – UTC Project (2014-2016)</i>	\$170,000	\$85,000 (PI)	Michigan Department of Transportation (MDOT)	A
<i>Feasibility of Dry And Treated Crumb Rubber Modified Asphalt Mixture Usage In Michigan (2014-2015)</i>	\$500,000	\$500,000 (PI)	Michigan Department of Environmental Quality (MDEQ)	C
<b>Subtotal (2014 – present):</b>	<b>\$1,428,716</b>	<b>\$1,343,716</b>		
<i>Crumb Rubber Modified Asphalt Pavements with High Reclaimed Asphalt pavement (RAP) Content (2013-2014)</i>	\$585,000	\$585,000 (PI)	Michigan Department of Environmental Quality (MDEQ)	C
<i>A Method to Assess the Use of New and Recycled Materials in Pavements (2013-2015)</i>	\$198,655	\$89,395 (PI)	Michigan Department of Transportation (MDOT)	C
<i>Center for Highway Pavement Preservation (CHP2) (2013 – 2014)</i>	\$1,500,000	\$45,000	U.S. Department of Transportation	C
<i>Preparation for Implementation of the Mechanistic-Empirical Design Guide in Michigan (2011-2014)</i>	\$400,000	\$80,000 (Co-PI)	Michigan Department of Transportation (MDOT)	C
<i>Crumb Rubber Modified Asphalt Sidewalks (2012-2013)</i>	\$300,000	\$240,000 (PI)	Michigan Department of Environmental Quality (MDEQ)	C
<i>Enhanced Analysis of Falling Weight Deflectometer Data for use with Mechanistic-Empirical Flexible Pavement Design and Analysis and Recommendations for Improvements for Falling Weight Deflectometer (2011-2013)</i>	\$338,173	\$135,269 (Co-PI)	Federal Highway Administration (FHWA)	C
<i>A Lattice Boltzmann Based Model for Predicting Unsaturated Flow through Soil Macropores and Capillary Pores (2011-2012)</i>	\$211,645	\$105,823 (Co-PI)	National Science Foundation (NSF)	C
<i>Nondestructive evaluation of nozzle-based foamed asphalt binders (2012-2013) (Usage of 5-BM-C X-ray Microtomography beamline at the Argonne National Laboratory (ANL))</i>	\$50,000*	\$50,000* (PI)	U.S. Department of Energy (DOE)	C

<i>Development of Design Guidelines for Crumb Rubber Modified Asphalt Pavements in Michigan (2010-2012)</i>	\$703,299	\$562,639 (PI)	Michigan Department of Environmental Quality (MDEQ)	C
<i>Relationships Between Laboratory-Measured and Field-Derived Properties of Pavement Layers (2009-2011)</i>	\$500,000	\$71,387 (Co-PI)	FHWA (subcontract from Cornell University)	C
<i>Reducing Noise Pollution from Roadways through Improved Pavement Material Properties (2008-2010)</i>	\$40,000	\$40,000 (PI)	Michigan State University-Intramural Research Grants Program	C
<i>Technical Support on Image Analysis and Numerical Modeling Tools for Advanced Characterization of Asphalt Mixtures (2009-2010)</i>	\$69,166	\$69,166 (PI)	FHWA (subcontract from SES Group & Associates)	C
<i>Nondestructive evaluation of emulsification and foaming processes of warm mix asphalt technologies (2010-2011)</i> (Usage of 5-BM-C X-ray Microtomography beamline at the Argonne National Laboratory (ANL))	\$50,000*	\$50,000* (PI)	U.S. Department of Energy (DOE)	C
<i>Pavement Materials Testing (2010)</i>	\$6,095	\$6,095 (PI)	University of Massachusetts	C
<i>Pavement Materials Testing (2009)</i>	\$4,439	\$4,439 (PI)	University of Massachusetts	C
<i>Development of Image Analysis Tools for Internal Structure Characterization of Warm Mix Asphalt Pavements (2009-2010)</i>	\$25,000	\$25,000 (PI)	FHWA (subcontract from University of Wisconsin)	C
<i>Moisture Consumption during Gas Production in Landfills: Implications to Permitting ET Caps (2008-2009)</i>	\$20,000	\$10,000	Environmental Research and Education Foundation (EREF)	C
<i>Sensing; Analyzing; and Forecasting evaluation (SAFE) System for Bioreactor Landfills (2008-2009)</i>	\$5,000	\$1,700	National Science Foundation (NSF)	C
<b>Total (2008 – present):</b>		<b>\$6,410,188</b>	<b>\$3,402,929</b>	

Notes: \*This amount is based on estimated usage costs of typical commercial X-ray Microtomography system. We were granted (through competitive proposal process) seven days (24hrs per day) free usage of the 5-BM-C beamline at the ANL, which would cost ~ \$50,000 if we did the scanning at a commercial lab. This proposal did not go through the cga since no funds were directly requested.

\*\* (A=Active, C=Completed)

## PATENTS FILED

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- *Title: Asphalt Foam Collapse Test Methods and Related Apparatus.* U.S. Provisional Application No. 61/833,232, which was filed with the U.S. Patent and Trademark Office on June 10, 2013.

## PUBLICATIONS

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### Articles in Refereed Journals

*Under review / accepted / in-press*

1. **Kutay, M. E.** and M. Lanotte (2016) "Viscoelastic Continuum Damage (VECD) Models for Cracking Problems in Asphalt Mixtures", *International Journal of Pavement Engineering (IJPE)*, *accepted*.

*Published*

2. Varma, S., and **Kutay, M. E.**, (2016) "Viscoelastic Nonlinear Multilayered Model for Asphalt Pavements." *Journal of Engineering Mechanics*, 04016044.
3. Krcmarik, M., Varma, S., **Kutay, M. E.**, & Jamrah, A. (2016). Development of Predictive Models for Low-Temperature Indirect Tensile Strength of Asphalt Mixtures. *Journal of Materials in Civil Engineering*, 04016139.
4. Kocak, S., and **Kutay, M. E.**, (2016) "Use of crumb rubber in lieu of binder grade bumping for mixtures with high percentage of reclaimed asphalt pavement." *Road Materials and Pavement Design*, 1-14. DOI: 10.1080/14680629.2016.1142466.
5. Jamrah, A., and **Kutay, M.E.** (2015) "Investigation of Different Methods for Obtaining Asphalt Mixture Creep Compliance for Use in Pavement Mechanistic–Empirical Design Software", *Transportation Research Record: Journal of the Transportation Research Board*, No. 2524 on pp. 100–109, DOI: 10.3141/2524-10.
6. Jamrah, A., **Kutay, M.E.** and Varma, S. (2015) "Backcalculation of swollen crumb rubber modulus in asphalt rubber binder and its relation to performance", *Transportation Research Record: Journal of the Transportation Research Board*, No. 2505, pp. 99–107, DOI: 10.3141/2505-13
7. **Kutay, M. E.**, Varma, S. and Jamrah, A. (2015) "A Micromechanical Model to Create Digital Microstructures of Asphalt Mastics and Crumb Rubber Modified Binders", *International Journal of Pavement Engineering (IJPE)*, DOI: 10.1080/10298436.2015.1057139
8. Ozturk, H.I. and **Kutay, M.E.** (2014) "Sensitivity of Nozzle–Based Foamed Asphalt Binder Characteristics to Foaming Parameters" *Transportation Research Record: Journal of the Transportation Research Board. Volume 2444 / Asphalt Materials and Mixtures, Vol. 1*, pp. 120-129, DOI: 10.3141/2444-14.

9. Varma, S. and **Kutay, M. E.** (2014) "Backcalculation of Viscoelastic and Nonlinear Flexible Pavement Layer Properties from Falling Weight Deflections", *International Journal of Pavement Engineering*. Taylor & Francis, DOI: 10.1080/10298436.2014.993196
10. Saravanathiiban, D., **Kutay, M. E.**, Khire, M. (2014) "Effect of Macropore Morphology on Preferential Flow through Saturated Soil: A Lattice Boltzmann Study", *Computers and Geotechnics*, Volume 59, Pages 44–53.
11. Buttlar, W., Hill, B., Kim, R., **Kutay, M.E.**, Millen, A., Montepara, A., Paulino, G., Petit, C., Pop, I., Romeo, E., Roncella, R., Safavizadeh, S., Tebaldi, G., Wargo, A. (2014) "Digital image correlation techniques to investigate strain fields and cracking phenomena in asphalt materials" *Materials and Structures*. 47:1373–1390
12. Ozturk, H.I., **Kutay, M.E.** and Littrup, G. (2014) "A Novel Testing Procedure for Foamed Warm Mix Asphalt Binders" *ASCE Journal of Materials in Civil Engineering*, Vol. 26(8), 04014042, (DOI: 10.1061/(ASCE)MT.1943-5533.0000924).
13. Ozturk, H.I. and **Kutay, M.E.** (2014) "An Artificial Neural Network Model for Virtual Superpave Asphalt Mixture Design", *International Journal of Pavement Engineering*, Volume 15, Issue 2, 2014, pages 151- 162 (DOI: 10.1080/10298436.2013.808341).

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14. Varma,S., **Kutay, M. E.** and Levenberg, E. (2013) "A Viscoelastic Genetic Algorithm for Inverse Analysis of Asphalt Layer Properties from Falling Weight Deflections" *Transportation Research Record: Journal of the Transportation Research Board*, Vol. 2369, No. 4, pp. 38-46 (DOI: 10.3141/2369-05).
15. Mogawer, W., Austerman, A., Mohammed, L., and **Kutay, M. E.** (2013) "Evaluation of High RAP-WMA Asphalt Rubber Mixtures", *Road Materials and Pavement Design*, Special Issue: Papers from the 88th Association of Asphalt Paving Technologists' Annual Meeting, Vol. 14, Supl. 2, pp. 129-147.
16. **Kutay, M.E.** and Ozturk, H. (2012) "Investigation of Moisture Dissipation in Foam-based Warm Mix Asphalt Using Synchrotron-Based X-Ray Microtomography", *ASCE Journal of Materials in Civil Engineering*, Vol. 24, No 6, pp. 674-683.
17. Mbarki, R., **Kutay, M.E.**, Gibson, N. and Abbas, A. (2012) "Comparison between Fatigue Performances of Horizontal Cores from Different Asphalt Pavement Depths and Laboratory Specimens", *Road Materials and Pavement Design*, Vol. 13, No 2, pp. 422-432.
18. Kocak, S. and **Kutay, M.E.** (2012) "Relationship between Material Characteristics of Asphalt Mixtures and Highway Noise", *Transportation Research Record: Journal of the Transportation Research Board*, Vol. 2295, pp. 35-43.
19. Coenen, A. R., **Kutay, M. E.**, Sefidmazgi, N. R. and Bahia, H. U. (2012) "Aggregate structure characterisation of asphalt mixtures using two-dimensional image analysis", *Road Materials and Pavement Design*, Vol. 13, No 3, pp. 433-454
20. **Kutay, M.E.**, Chatti, K. and Lei, L. (2011) "Backcalculation of Dynamic Modulus from FWD Deflection Data", *Transportation Research Record: Journal of the Transportation Research Board*, TRR 2227, Vol. 3, pp. 87-96.

21. Li, X., Gibson, N., Clyne, T., Johnson, E., **Kutay, M.E.** (2011) "Laboratory Evaluation of Asphalt Binders and Mixtures Containing Polyphosphoric Acid", *Transportation Research Record: Journal of the Transportation Research Board, TRR 2210, Vol. 4, pp. 47-56.*
22. Wen, H., **Kutay, M.E.** and Shen, S. (2011) "Evaluation of the Effects of Asphalt Binder on the Properties of Hot Mix Asphalt at Intermediate Temperatures", *ASTM Journal of Testing and Evaluation, Vol. 39, Issue 3.*
23. **Kutay, M.E.**, Ozturk, H., Abbas, A. and Hu, C (2011) "Comparison of 2D and 3D Image-Based Aggregate Morphological Indices", *International Journal of Pavement Engineering, Vol. 12, Issue 4, pp. 421-431.*
24. Mogawer, W. S., Austerman, A. J., **Kutay, M. E.** and Zhou, F. (2011) "Evaluation of Binder Elastic Recovery on HMA Fatigue Cracking using Continuum Damage and Overlay Test Based Analyses", *Road Materials and Pavement Design, Vol. 12, No. 2, pp. 345-376.*

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25. **Kutay, M.E.**, Arambula, E., Gibson, N.H. and Youtcheff, J. (2010) "Three-Dimensional Image Processing Methods to Identify and Characterize Aggregates in Compacted Asphalt Mixtures", *International Journal of Pavement Engineering, Vol. 11, Issue 6, pp. 511-528.*
26. Gibson, N., Li, X., **Kutay, M.E.** (2010) "Rutting Resistance of Laboratory Prepared and Field Compacted Asphalt Mixtures", *Transportation Research Record: Journal of the Transportation Research Board, Vol. 2181, pp109-116.*
27. Korkmaz, K. A. and **Kutay, M. E.** (2010) "Automated Hazard Assessment Techniques Using Satellite Images Following the 2008 Sichuan China Earthquake", *Human and Ecological Risk Assessment: An International Journal, 16: 3, 463 — 477*
28. **Kutay, M.E.**, Gibson, N.H., Youtcheff, J. and Dongre, R. (2009) "Use of Small Samples to Predict Fatigue Lives of Field Cores: Newly Developed Formulation Based on Viscoelastic Continuum Damage Theory", *Transportation Research Record: Journal of the Transportation Research Board, Vol. 2127, pp. 90-97.*
29. Gibson, N.H., **Kutay, M.E.**, Keramat, D. and Youtcheff, J. (2009) "Multiaxial Strain Response of Asphalt Concrete Measured During Flow Number Simple Performance Test", *Journal of the Association of Asphalt Paving Technologists, Vol. 78.*
30. **Kutay, M.E.** and Aydilek, A.H. (2009) "Pore Pressure and Viscous Shear Stress Distribution due to Water Flow within Asphalt Pore Structure", *Computer Aided Civil and Infrastructure Engineering, Vol. 24, 212–224.*
31. You, Z., Adhikari, S. and **Kutay, M. E.** (2009) "Dynamic modulus simulation of the asphalt concrete using the X-ray computed tomography images", *Materials and Structures, Vol. 42, No. 5, 617-630.*
32. Arambula, E. and **Kutay, M. E.** (2009) "Tension-Compression Fatigue Test Evaluation Using Fracture Mechanics and Field Data", *Road Materials and Pavement Design, Vol. 10/1 pp. 83-108.*
33. **Kutay, M.E.**, Gibson, N.H. and Youtcheff, J. (2008) "Conventional and Viscoelastic Continuum Damage (VECD) based Fatigue Analysis of Polymer Modified Asphalt Pavements", *Journal of the Association of Asphalt Paving Technologists, Vol. 77, pp. 395-434.*

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34. **Kutay, M.E.**, Aydilek, A.H., Masad, E., and Harman, T. (2007) "Computational and Experimental Evaluation of Hydraulic Conductivity Anisotropy in Hot Mix Asphalt", *International Journal of Pavement Engineering*. Vol. 8, Issue 1, pp. 29-43.
35. **Kutay, M.E.**, Aydilek, A.H., and Masad, E. (2007) "Estimation of Directional Permeability of HMA Based on Numerical Simulation of Micro-scale Water Flow", *Transportation Research Record: Journal of the Transportation Research Board*, No. 2001, TRB, National Research Council, Washington, D.C., pp. 29-36.
36. **Kutay, M.E.**, Weaver, E., and Wisner, L. (2007) "Development of Correction Functions for Spectral Compatibility of Inertial Profilers Used in the LTPP Program", *Transportation Research Record: Journal of the Transportation Research Board*, No. 2005, TRB, National Research Council, Washington, D.C., 2007, pp. 145-152.
37. Tanesi, J., **Kutay, M.E.**, Abbas, A., and Meininger, R. (2007) "Effect of Coefficient of Thermal Expansion Variability on Concrete Pavement Performance as Predicted Using Mechanistic-Empirical Pavement Design Guide", *Transportation Research Record: Journal of the Transportation Research Board*, No. 2020, TRB, National Research Council, Washington, D.C., 2007, pp. 40-44.
38. **Kutay, M.E.**, and Aydilek, A.H. (2007) "Dynamic Effects on Moisture Transport in Asphalt Concrete", *ASCE Journal of Transportation Engineering*, Vol. 133, No. 7, pp. 406-414.
39. Abbas, A.R., **Kutay, M.E.**, Azari, H. and Rasmussen, R. (2007) "Three-Dimensional Surface Characterization of Portland Cement Concrete Pavements", *Computer Aided Civil and Infrastructure Engineering*. Vol. 22, No 3, pp. 197-209.
40. **Kutay, M.E.**, Aydilek, A.H. and Masad, E. (2006). "Laboratory Validation of Lattice Boltzmann Method for Modeling Pore-Scale Flow in Granular Materials", *Computers and Geotechnics*, Vol. 33, pp 381-395.
41. **Kutay, M.E.**, Guler, M., and Aydilek, A.H. (2006) "Analysis of Factors Affecting Strain Distribution in Geosynthetics", *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, Vol. 132, No. 1, pp. 1-11
42. **Kutay, M.E.** and Aydilek, A.H. (2005) "Filtration Performance of Two-Layer Geotextile Systems", *Geotechnical Testing Journal*, ASTM, Vol. 28, No. 1.
43. **Kutay, M.E.** and Aydilek, A.H. (2004) "Retention Performance of Geotextile Containers Confining Geomaterials", *Geosynthetics International*, IGS, Thomas Telford Publishers, Vol. 11, No. 2, pp. 100-113.
44. Aydilek, A.H. and **Kutay, M.E.** (2004) "Development of an Innovative Computer Controlled Water Deairing System for Hydraulic Testing of Geosynthetics", *Journal of Testing and Evaluation*, ASTM, Vol. 32, No. 2, pp. 161-166.

**Articles in Refereed Special Publications, Reports / Other Peer-reviewed Publications**

1. **Kutay, M. E.**, Buch, N., Haider, S., Korkmaz, A., Jamrah, A., Varma, S. (2015) "A Method to Assess the Use of New and Recycled Materials in Pavements", Final Report RC-1624. Project Research No. OR14-008, Michigan Department of Transportation, 100p.



2. Chatti, K., **Kutay, M. E.**, Lajnef, N., Zaabar, I., Varma, S. and Lee, H.S. (2014) "Enhanced Analysis of Falling Weight Deflectometer Data for use with Mechanistic-Empirical Flexible Pavement Design and Analysis and Recommendations for Improvements to Falling Weight Deflectometer", FHWA Report, Grant No. DTFH61-11-C-00026.

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3. Martin, A. E., Arambula, E., **Kutay, M. E.**, Lawrence, J., Luo, X., and Lytton, R. (2013) "Comparison of Fatigue Analysis Approaches for Hot Mix Asphalt to ensure a State of Good Repair", U.S. DOT University Transportation Centers (UTC) Program, Southwest Region UTC, Report No: SWUTC/13/600451-00012-1.
4. **Kutay, M. E.** and Jamrah, A. (2013) "Preparation for Implementation of the Mechanistic-Empirical Pavement Design Guide in Michigan, Part 1: HMA Mixture Characterization", Michigan Department of Transportation (MDOT) Research Report, ORBP OR10-022, REPORT NO RC-1593, 120 p.
5. Bhasin, A., Masad, E., **Kutay, M. E.**, Buttlar, W., Kim, Y.R., Marasteanu, M., Kim, Y.R., Schwartz, C., Carvalho, R. (2012) "Applications of Advanced Models to Understand Behavior and Performance of Asphalt Mixtures", Transportation Research Circular E-C161, 86 p.
6. **Kutay, M.E.** (2012) "High speed stereo vision system (HS-SVS) for measuring displacements and strains during laboratory testing of infrastructure materials". A state-of-the-art report on advanced measurement systems, prepared for the RILEM TG3.
7. Gibson, N., Qi, X., Shenoy, A., Al-Khateeb, G., **Kutay, M. E.**, Andriescu, A., Stuart, K., Youtcheff, J., Harman T. (2012) Full-Scale Accelerated Performance Testing for Superpave and Structural Validation, Transportation Pooled Fund Study TPF-5(019) and SPR-2(174) Accelerated Pavement Testing of Crumb Rubber Modified Asphalt Pavements. FHWA-HRT-11-045. 297 p.

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8. **Kutay, M.E.**, Ozturk, H.I. and Gibson, N. (2010) "3D Micromechanical Simulation of Compaction of Hot Mix Asphalt Using Real Aggregate Shapes Obtained from X-ray CT", *ASCE Engineering Mechanics Institute's Special Publication: Pavements and Materials: Testing and Modeling in Multiple Length Scales*. Reston, VA.

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9. Guler M., **Kutay, M. E.**, Aydilek A. H. and Dafla, H. (2005). "Evaluation of Strain Distribution in Geotextiles Using Image Analysis" *Geotechnical Special Publications*, ASCE, No. 130-142, pp. 3941-3948.
10. **Kutay, M.E.** and Aydilek A. H. (2005) "Modeling Moisture Transport in Asphalt Pavements", Environmental Geotechnics Report 05-1, University of Maryland, College Park, MD, 294 p.
11. **Kutay, M.E.** and Aydilek A. H. (2003) "Hydraulic Compatibility of Geotextile Containers Confining Geomaterials", Environmental Geotechnics Report 03-2, University of Maryland, College Park, MD, 130 p.

#### Articles in Refereed Conference Proceedings

1. Ozdemir, U., Hibner, D., Kutay, M. E., and Lanotte, M. (2017-accepted) "Image Processing Techniques For Determination Of Aggregate Embedment Depth In Chip Seals", 96th Transportation Research Board Annual Meeting, January 8-12, 2017, Washington, D.C.
2. Kocak, S., & **Kutay, M. E.** (2016). Combined Effect of SBS and Devulcanized Rubber (DVR) Modification on Performance Grade and Fatigue Cracking Resistance of Asphalt Binders. In 8th RILEM International Conference on Mechanisms of Cracking and Debonding in Pavements (pp. 269-274). Springer Netherlands.
3. Jamrah, A. and **Kutay, M.E.** (2015) "A Method for Quantifying the Extent of Crumb Rubber Pre-treatment", IRF Europe & Central Asia Regional Congress, September 15-18, 2015 – Istanbul, Turkey.
4. Kocak, S. and **Kutay, M.E.** (2015) "A Hybrid Terminally Blend - Dry Crumb Rubber Modified Asphalt Mixture – CRHY", Rubberized Asphalt Rubber Conference, October 4-7, 2015, Las Vegas, NV.
5. Kocak, S. and **Kutay, M.E.** (2015) "Feasibility of using crumb rubber modifier in lieu of grade bumping for high percent reclaimed asphalt pavement (RAP) mixtures in Michigan" *94<sup>th</sup> Annual Transportation Research Board Conference, Washington, D.C., January 11-15, 2015.*
6. Ozturk, H.I. and **Kutay, M.E.** (2014) "Effect of Foamed Binder Characteristics on Warm Mix Asphalt (WMA) Performance", *Proceedings of 93<sup>rd</sup> Annual Transportation Research Board Conference, Washington, D.C., January 12-16, 2014.*
7. Jamrah, A., **Kutay, M.E.**, and Ozturk, H.I. (2014) "Characterization of Asphalt Materials Common to Michigan in Support of the Implementation of the Mechanistic-Empirical Pavement Design Guide" *Proceedings of 93<sup>rd</sup> Annual Transportation Research Board Conference, Washington, D.C., January 12-16, 2014.*

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8. Ozturk, H.I. and **Kutay, M.E.** (2013) (in Turkish) "Püskürtme Tekniğiyle Üretilen Köpük Bitümlü İlik Karışım Asfalt Üretimi (Characterization of Nozzle-Based Foamed Warm Mix Asphalt)" 6. Ulusal Asfalt Sempozyumu (6<sup>th</sup> National Asphalt Symposium), 26-27 November 2013, Ankara, Turkey.
9. Ozturk, H.I. and **Kutay, M.E.** (2013) (in Turkish) "Lastik Modifiyeli Bitümlerin Sıcak Karışımlarda Kullanım Potansiyelleri (Potential Use of Crumb Rubber Modified Bitumens in Hot Mix Asphalt)" 6. Ulusal Asfalt Sempozyumu (6<sup>th</sup> National Asphalt Symposium), 26-27 November 2013, Ankara, Turkey.
10. **Kutay, M. E.**, Gibson, N.H. and Li, X. (2013) "A 3D Image Correlation Algorithm for Tracking Movement of Aggregates in X-Ray CT Images of Asphalt Mixtures Captured During Compaction", *Proceedings of RILEM2013 Symposium on Multi Scale Modeling and Characterization of Infrastructure Materials*, 10-12 June 2013 in Stockholm, Sweden.
11. Varma, S., **Kutay, M. E.** and Chatti, K. (2013) "Data Requirements from Falling Weight Deflectometer Tests for Accurate Backcalculation of Dynamic Modulus Master curve of Asphalt Pavements" *Proceedings of 2013 Airfield & Highway Pavement Conference*, Los Angeles, CA June 9-12, 2013.

12. Harsini, I., Brink, W.C., Haider, S. W., Chatti, K., Buch, N., Baladi, G. Y. and **Kutay, M. E.** (2013) "Sensitivity of Input Variables for Flexible Pavement Rehabilitation Strategies in the M-E PDG", Proceedings of 2013 Airfield & Highway Pavement Conference, Los Angeles, CA June 9-12, 2013.
13. Brink, W.C., Harsini, I., Haider, S. W., Chatti, K., Buch, N., Baladi, G. Y. and **Kutay, M. E.** (2013) "Sensitivity of Input Variables for Rigid Pavement Rehabilitation Strategies in the MEPDG", Proceedings of 2013 Airfield & Highway Pavement Conference, Los Angeles, CA June 9-12, 2013.
14. **Kutay, M. E.**, Ozturk, H., (2012) "Internal structure characteristics of crumb rubber modified asphalt binders: An analysis using 3D X-ray Microtomography Imaging", *Asphalt Rubber 2012 Conference, 23-25 October 2012, Munich, Germany.*
15. Ozturk, H. and **Kutay, M. E.** (2012) "Improving Efficiency of Asphalt Mix Design using Artificial Neural Networks" 10<sup>th</sup> International Congress on Advances in Civil Engineering, 17-19 October 2012, Ankara, Turkey.
16. Ozturk, H., Tascioglu, B., **Kutay, M. E.** and Littrup, G. (2012) "Impact of Crumb Rubber Modified Binder Preparation Process on Hot Mix Asphalt Performance", *5th Eurasphalt & Eurobitume Congress, 2012, Istanbul, Turkey.*

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17. **Kutay, M. E.** and Khire, M. (2010) "Numerical Modeling of Multiphase Flow Through Micro- And Macro- Pores of Clay Landfill Caps Using Lattice Boltzmann Method", *7<sup>th</sup> International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics, 19-21 July 2010, Antalya, Turkey.*
18. **Kutay, M.E.**, Petros, K., and Kocak, S. (2010) "A New Numerical Modeling Approach for Sound Propagation and Generation: the Lattice Boltzmann Method", *Proceedings of 2010 Transportation Research Board Conference, January 10-14, 2010, Washington, D.C.*
19. Wen, H., **Kutay, M.E.** and Shen, S. (2010) "Evaluation of the Effects of Asphalt Binder on the Properties of Hot Mix Asphalt at Intermediate Temperatures", *Proceedings of 2010 Transportation Research Board Conference, January 10-14, 2010, Washington, D.C.*
20. **Kutay, M.E.** (2010) "Computation of aggregate contact points, orientation and segregation in asphalt specimens using their X-ray CT images", *3<sup>rd</sup> International Workshop on X-ray CT for Geomaterials, March 1-3, 2010, New Orleans, LA.*
21. **Kutay, M.E.**, Gibson, N.H. and Youtcheff, J. (2008) "Three-Dimensional Image Processing Methods for Analysis of Characteristics of Aggregates in Asphalt Mixtures", *4<sup>th</sup> International Conference on Advances in Mechanical Engineering and Mechanics, 16-18 December, 2008, Sousse, Tunisia.*
22. **Kutay, M.E.**, Arambula, E., Gibson, N., Youtcheff, J. and Petros, K. (2008) "Use of Artificial Neural Networks to Detect Aggregates in Poor-Quality X-ray CT Images of Asphalt Concrete", *ASCE T&DI Pavements Conference, October 2008, Seattle, Washington.*
23. **Kutay, M.E.**, Gibson, N.H. and Youtcheff, J. (2008) "Use of pseudostress and pseudostrain concepts for characterization of asphalt fatigue tests", *Proceedings of the 6<sup>th</sup> RILEM International Conference on Cracking in Pavements, Chicago, USA, June 16-18, 2008.*

24. Qi, X., Shenoy, A., **Kutay, M.E.**, Gibson, N.H., Youtcheff, J. and Harman, T. (2008) "Update on FHWA ALF Tests of Modified Binder Pavements", *3<sup>rd</sup> International Conference on Accelerated Pavement Testing*.
25. **Kutay, M.E.** and Aydilek, A. H. (2008) "Numerical Modeling of Suspensions using the Lattice Boltzmann Method", *ASCE GeoCongress 2008*, March 9-12, 2008, New Orleans, LA.
26. Adhikari, S., You, Z., and **Kutay, M. E.** (2008) "Prediction of Dynamic Modulus of Asphalt Concrete using Two-Dimensional and Three-Dimensional Discrete Element Modeling Approach", *ASCE GeoCongress 2008*, March 9-12, 2008, New Orleans, LA.

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27. **Kutay, M. E.** (2007) "Spectral Analysis of Factors Affecting Roughness in Flexible Pavements", *PIARC Paper Contest, 23<sup>rd</sup> World Road Congress*. September 17-21, 2007, Paris, France. Paper selected as the USA entrant for the international contest.
28. Aydilek A.H., **Kutay, M.E.**, Sparacino, R., and Dafla, H. (2007) "Image Analysis for QC/QA of Geosynthetic Deformation during Wide Width Tensile Testing", *Proceedings of Geosynthetics 2007 Conference*, January 16-19, 2007, Washington, D.C.
29. **Kutay, M.E.** and Aydilek A.H. (2006) "Accuracy of the Two Common Semi-Analytical Equations in Predicting Asphalt Permeability", *GeoX 2006, 2nd International Workshop on X-Ray CT for Geomaterials*. October 4-7, 2006 - Grenoble & Aussois, France.
30. **Kutay, M.E.** Aydilek, A.H. and Harman, T. (2006) "Dynamic Hydraulic Conductivity (Permeability) of Asphalt Pavements", *ASCE GeoCongress 2006*. February 26-March 1, 2006, Atlanta, Georgia.
31. **Kutay, M.E.** Aydilek, A.H., and Hussein, S. (2005). "Dewatering Fly Ash Slurries Using Geotextile Containers", *Proceedings of Geo-Frontiers 2005*, January 2005, Austin, Texas.
32. **Kutay, M.E.** and Aydilek A.H. (2005) "Hydraulic Compatibility of Geotextile Containers Confining Dredged Sediments", *Proceedings of the Sixteenth International Conference on Soil Mechanics and Geotechnical Engineering*, September 2005, Osaka, Japan.
33. **Kutay, M.E.** and Aydilek, A.H. (2003) "Hydraulic Compatibility of Geotextile Drains with Fly Ash in Pavement Structures", *Proceedings of the 82<sup>nd</sup> Annual Meeting of the Transportation Research Board*, January 2003, Washington, D.C (CD-Rom), 15 p.

## PRESENTATIONS

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1. Kumbarger Y., Ozdemir, U., Hibner, D., Lanotte, M. **Kutay, M.E.** "An Acceptance Test Protocol for Chip Seal Projects using Image Analysis Techniques" National Pavement Preservation Conference, Nashville, TN, 10/10-10/14, 2016.
2. **Kutay, M.E.** (2015) "Applications of image processing techniques in pavement and geotechnical engineering", 11-12-2015, Middle East Technical University, Ankara, Turkey.
3. **Kutay, M.E.** (2015) "Applications of image processing techniques in pavement and geotechnical engineering", 12-18-2015, Meliksah University, Kayseri, Turkey.

4. **Kutay, M.E.** (2015) "ABD'de Ilık Karışım Asfalt (IKA) Uygulamaları (Applications of Warm Mix Asphalt (WMA) Technologies in the U.S.)", Ilık Karisim Asfalt Teknoloji ve Uygulamaları Calistayi (Warm Mix Asphalt Technologies and their Applications Workshop), Ankara, Turkey, September 2, 2015. (Invited speaker).
5. **Kutay, M.E.** and Jamrah, A. (2015) "A Method for Quantifying the Extent of Crumb Rubber Pre-treatment", IRF Europe & Central Asia Regional Congress September 15-18, 2015 – Istanbul, Turkey.
6. **Kutay, M.E.** (2015) "American Society of Engineering Education (ASEE), National Effective Teaching Seminar (NETI) Notes", Society of Turkish American Scholars (STAS) Training Program on Effective Teaching, March 15, 2015, Columbus, OH. (Invited speaker).
7. **Kutay, M.E.** (2014) "Preparation For Implementation of the Mechanistic-Empirical Pavement Design Guide in Michigan, Part -1 HMA Characterization", MDOT Technology Transfer Presentation, Lansing, MI, November 20, 2014.
8. **Kutay, M.E.**, and Jamrah, A. (2014) "DSR testing of GTR, Particle size effects", Asphalt Binder Expert Task Group Meeting, Baton Rouge, LA, September 16, 2014. (Invited speaker).
9. **Kutay, M.E.**, and Varma, S. (2014) "On the evolution of |E\*| master curve in the field, Analyses using layered viscoelastic models and inverse analysis methods using FWD data", ISAP 2014 conference workshop "Building the Road Connecting Models to Practices: Challenges and Opportunities", Raleigh, NC, June 2, 2014.
10. **Kutay, M.E.**, (2014) "Michigan Experience on Crumb Rubber Modified Asphalt, Comparative Evaluation of Terminally Blend, Wet and Dry Processes and X-Ray Microtomography – Based Analyses" Asphalt Mixture Expert Task Group Meeting, San Antonio, TX, April 1, 2014. (Invited speaker).
11. **Kutay, M.E.**, (2014) "DSR testing of GTR: Particle size and mixing temperature effects", Asphalt Binder Expert Task Group Meeting, San Antonio, TX, April 3, 2014. (Invited speaker).
12. Varma, S., **Kutay, M.E.** (2014) "Backcalculation of Viscoelastic and Nonlinear Flexible Pavement Layer Properties from Falling Weight Deflections", *93<sup>rd</sup> Annual Transportation Research Board Conference, Washington, D.C., January 12-16, 2014.*
13. **Kutay, M.E.**, (2013) "2D and 3D Image Analysis Methods for Characterization of Asphalt Mixtures and Aggregates", University of Michigan – Ann Arbor, Geotechnical Engineering Seminars, November 6, 2013 (Invited speaker).
14. **Kutay, M.E.**, (2013) "Michigan Experience on Crumb Rubber Modified Asphalt: Comparative Evaluation of Terminally Blend, Wet and Dry Processes and X-Ray Microtomography – Based Analyses", 6<sup>th</sup> Rubber Modified Asphalt Conference, Tempe, AZ, Oct 16, 2013 (Invited speaker).
15. **Kutay, M.E.**, (2013) "A 3D Image Correlation Algorithm for Tracking Movement of Aggregates In X-Ray CT Images of Asphalt Mixtures Captured During Compaction", International RILEM Conference on Multi-Scale Modeling and Characterization of Infrastructure Materials, 10-12 June 2013, Stockholm, Sweden.
16. **Kutay, M.E.**, (2013) "Applications of Traditional and Non-traditional Optical Flow Techniques in Asphalt Mixture Testing" Pre-Conference Workshop on Digital Image Correlation Techniques to Investigate Strain Fields and Cracking Phenomena in Asphalt Materials, April 7, 2013, Denver, CO.

17. **Kutay, M.E.**, (2012) "Recent Research on Crumb Rubber Modified Binder Preparation Process on HMA Performance in Michigan", Crumb Rubber Modified Asphalt (CRMA) 101 Workshop, Michigan State University, February 27, 2012 East Lansing, MI.
18. **Kutay, M.E.** (2012) "Backcalculation of Dynamic Modulus Mastercurve of Asphalt Pavements: Data Requirements from FWD", Presentation made at the Transportation Research Board AFD 80 Committee Meeting, January 25, 2012, Washington, DC.
19. **Kutay, M.E.**, (2011) "FHWA Project Task 2: Conduct theoretical analyses to identify suitable data requirements from FWD in light of current FWD technology and feasible equipment enhancements", FWD User's Group Meeting, October 16-18, 2011, Champaign, Illinois.
20. **Kutay, M.E.**, (2011) "Practical Fatigue Characterization of Asphalt Mixtures using PP\_VECD (Push-Pull test based Viscoelastic Continuum Damage analysis) Software" Transportation Research Board (TRB) Webinar on Applications of Advanced Models on Asphalt Pavements, October 11, 2011.
21. **Kutay, M.E.**, (2011) "Investigation of Moisture Dissipation in Foamed Asphalt Using Synchrotron-Based X-Ray Micro-tomography", ASCE Engineering Mechanics Institute Conference, Northeastern University, June 2, 2011, Boston, MA.
22. **Kutay, M.E.**, (2011) "Back-calculation of Dynamic Modulus ( $|E^*|$ ) Mastercurve from FWD Surface Deflections" Presented at the TRB Annual Meeting, January 23, 2011, Washington, DC.
23. **Kutay, M.E.**, (2010) "Internal Structure Characterization of Asphalt Mixtures: Image-Based Methods", Transportation Research Board (TRB) Webinar on Applications of Advanced Models on Asphalt Pavements, October 7, 2010.
24. **Kutay, M.E.**, (2010) "VECD (Visco-Elastic Continuum Damage): State-of-the-art technique to evaluate fatigue damage in asphalt pavements", RILEM WG7 Workshop on Asphalt Binders and Mastics, September 17, 2010, Madison, WI.
25. **Kutay, M.E.**, (2010) "Numerical Modeling of Multiphase flow through Micro- and Macro- Pores of Clay Landfill Caps using Lattice Boltzmann Method", HEFAT2010, 7th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics, 19-21 July 2010, Antalya, Turkey.
26. **Kutay, M.E.**, (2010) "Comparison between Fatigue Performances of Horizontal Cores from Different Asphalt Pavement Depths and Laboratory Specimens". 1<sup>st</sup> International Conference of Middle East Society of Asphalt Pavements (MESAT), July 4th, 2010, Beirut, Lebanon.
27. **Kutay, M.E.** (2010) "Computation of aggregate contact points, orientation and segregation in asphalt specimens using their X-ray CT images", 3<sup>rd</sup> International Workshop on X-ray CT on Geomaterials, Feb 28- Mar 3, 2010, New Orleans, LA.
28. **Kutay, M.E.**, "Towards a New Micromechanical Model for Asphalt Compaction", Invited speaker at the AFK-50(1) Advanced Models to Understand Behavior and Performance of Asphalt Mixtures Subcommittee meeting, January 11, 2010.
29. **Kutay, M.E.**, "Practical 2D image analysis software and standardization", Presented at the RILEM TG2 meeting at Washington, DC. January 12, 2010.
30. **Kutay, M.E.**, "Image - based analysis of aggregate packing at different compaction levels", Presented at the Pre-conference Workshop on Compaction of Asphalt Pavements at Advanced

- Characterization and Testing of Bituminous Materials (ACTBM) conference, Rhodes-Greece, May 26, 2009.
31. **Kutay, M.E.**, “Quantification of Aggregate Packing in Asphalt Mixtures using 3D Image Processing and Artificial Neural Networks”, Invited seminar at the Middle East Technical University (METU), Ankara-Turkey, June 9, 2009.
  32. **Kutay, M.E.**, “Development of a standard image analysis software for determination of aggregate characteristics in HMA”, Presented at the RILEM TG2 meeting at Washington, DC. January 14, 2009.
  33. **Kutay, M. E.**, “Effect of sample size and type on the asphalt fatigue life based on viscoelastic continuum damage theory”, Presented at the TRB Annual Meeting, Washington, DC, January 15, 2009.
  34. **Kutay, M.E.** “3D image processing methods for analysis of characteristics of aggregates in asphalt mixtures”, Invited seminar at the University of Wisconsin-Madison, November 6<sup>th</sup>, 2008.
  35. **Kutay, M.E.** “Use of Artificial Neural Networks to Detect Aggregates in Poor-Quality X-ray CT Images of Asphalt Concrete”, ASCE T&DI Pavements Conference, October 18, 2008, Seattle, Washington.
  36. **Kutay, M.E.** “Practical Utilization of VECD theory in [M-e] Pavement Design”, 2008 Peterson Asphalt Research Conference and P3 Symposium, Laramie, WY, July 2008
  37. **Kutay, M.E.** “Conventional and Viscoelastic Continuum Damage (VECD) based Fatigue Analysis of Polymer Modified Asphalt Pavements”, Association of Asphalt Paving Technologists annual meeting, April 2008.
  38. **Kutay, M.E.** “Measurement & Modeling of Aggregate Packing for Asphalt Mixture Design”, Presented at the TRB Annual Meeting Workshop 108: Recent Developments in Characterization of Aggregate Shape, Angularity, and Texture, Washington, D.C., January 2008.
  39. **Kutay, M.E.** “Determining Aggregate Characteristics of HMA: 3D Processing of X-ray CT Images”, Presented at the RILEM WG07 meeting, Washington, DC, January 2008.
  40. **Kutay, M.E.**, Swanlund, M. and Petros, K. “Spectral Analysis of Development of Roughness in Flexible Pavements”, Presented at the Road Profilers User Group (RPUG) Annual Meeting, Williamsburg, VA, October 2007.
  41. **Kutay, M.E.**, Gibson, N. and Youtcheff, J. “HMA Durability Study: Effect of Aggregate Packing on HMA Performance”, Presented at the FHWA Asphalt Mixture ETG Meeting, Denver, CO, June 2008.
  42. **Kutay, M.E.**, Weaver, E. and Wiser, L. “Measurement Development of Transfer Functions for Spectral Compatibility of Inertial Profilers Used in the LTPP Program”, Presented at the TRB Annual Meeting, Washington, DC, January 2007.
  43. **Kutay, M.E.**, Aydilek, A. and Masad, E. “Estimation of Directional Permeability of HMA Based on Numerical Simulation of Micro-scale Water Flow”, Presented at the TRB Annual Meeting poster session, Washington, DC, January 2007.
  44. **Kutay, M.E.**, Aydilek, A. and Harman, T. “Dynamic Hydraulic Conductivity (Permeability) of Asphalt Pavements”, Presented at the ASCE GeoCongress06, Atlanta GA, March 2006.

45. **Kutay, M.E.** "Microstructural Modeling of HMA using Lattice Boltzmann Method", International Workshop: Microstructure and Micromechanics of Stone Based Infrastructure Materials, Blacksburg, VA, October 2006.
46. **Kutay, M.E.** "Spectral Analysis of Development of Roughness in Flexible Pavements", Invited seminar at Texas A&M University, College Station, TX, December 2005.

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## SERVICES AND MEMBERSHIPS

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### Institutional Service

- MSU – Associate Chair for Graduate Studies (Aug 2016 – present)
- MSU – Chair of Graduate Studies Committee (GSC) (Aug 2014 – May 2015).
- MSU – Member of Graduate Studies Committee (GSC) (Aug 2013 – May 2014). I was the secretary of the committee and take the minutes of the meetings, which are held every two weeks.
- Made a presentation at the NSF PIRE project boot camp on science and technology in Turkey (PI: Vlad Tarabara - MSU).
- MSU – AASHTO accreditation of MSU-Advanced Asphalt Characterization Laboratory (AACL). As of October 2009, AACL is officially within the list of labs accredited by AASHTO (see web site <http://www.amrl.net/>). Some of the major tasks included the preparation of Quality Systems Manual, calibrating and validating the laboratory equipment, training students, and preparation for the on-site assessment by AASHTO Materials Reference Laboratory (AMRL).
- MSU – Leader of Engineering Study Abroad in Turkey Program (Aug 2010 – present): I have been serving as the leader of the Engineering Study Abroad in Turkey program since August 2010. As part of this duty, I have been actively organizing events, preparing flyers, presentations, posters to recruit undergraduate students to the program. The events included information sessions where I made presentations about the program. I have also been attending the university level study abroad fairs. I also maintain a web site for the program.
- MSU – Member of Undergraduate Curriculum Committee (UGCC) (Aug 2011 – May 2013): I was the secretary of the committee and took the minutes of the meetings, which are held every two weeks. I also participated all its events.
- MSU – Served as a Connector Faculty (Fall 2011)
- MSU – Prepared an exhibit presentation and items for the MSU Museum: As part of the 3D imaging exhibit in MSU Museum, our work on application of 3D image-based strain measurement techniques has been featured. I've met with the MSU Museum staff several times and prepared a touch-screen exhibit presentation (using the software of [www.Prezi.com](http://www.Prezi.com)).
- MSU – Lab tours at COE Preview Day events (September 17, 2011 and September 25<sup>th</sup>, 2012): I gave a tour of Advanced Asphalt Characterization Laboratory (AACL) to several groups as part of the Preview Day event in Falls 2011 and 2012.
- College Of Engineering DEIP Position Search Committee Membership: Served on the College of Engineering's Search Committee for the Director of Engineering International Programs (DEIP) position. Reviewed 21 applicants and provided comments.
- MSU's Research Experiences for Students (RES) program: In summer 2010, I participated in the MSU's Research Experiences for Students (RES) program. The RES program included all-day hands-on experiences by high school students in our lab (AACL). The program lasted 4 weeks and the high school students spent one whole day at AACL each week. Total 20 students were involved in this program and each week approximately 5 students spent time in the lab. During each day, students were separated into different groups and a competition was set up where each group would



come up with the best asphalt mixture design. The winner of the competition was determined based on the least amount of total strain (at a given number of loading cycles) measured using image correlation method. Most of the students attended this program were either women or minority students and they seemed to have enjoyed this experience.

- MSU – 2010 "Engineering Connect" activity. EGR100 lab tour. 2 hr tour of lab to three groups with 20- students each and presentation of research.

### Public Service

- Editorial Board Member of the International Journal of Pavement Engineering (IJPE) (2014-present)
- Vice chair of ASCE Transportation & Development Institute (T&DI)-Highway Pavement Committee. (2015 – present)
- Member of TRB AFK50 Characteristics of Asphalt Paving Mixtures to Meet Structural Requirements. (2011 – present)
- Member of TRB AFS50 Modeling Techniques in Geomechanics Committee (2008-present)
- Serving in the scientific committee of the 6th Conference of the European Asphalt Technology Association (EATA2015), to be held in Stockholm 15-17 June 2015.
- Co-organized the second in the series of "Hands-on Workshops on Modeling of Asphalt Materials and Pavements" as part of my membership to TRB AFK50-1. The workshop title is "#2 Viscoelastic Continuum Damage Modeling of Asphalt Mixtures" held in Turner Fairbank Highway Research Center in McLean, VA, between Oct 23 and 24<sup>th</sup>, 2014.
- Co-organized the first in the series of "Hands-on Workshops on Modeling of Asphalt Materials and Pavements" as part of my membership to TRB AFK50-1. The workshop title is "#1 Modeling Plasticity in Asphalt Mixtures and Pavements" held in Turner Fairbank Highway Research Center in McLean, VA, between Oct 23 and 24<sup>th</sup>, 2013.
- Served in the scientific committee of the 12<sup>th</sup> ISAP (International Society for Asphalt Pavements) conference on asphalt pavements to be held in June 1–5, 2014 at Raleigh, North Carolina. (May – September 2013)
- Served in the scientific committee of the ASCE T&DI Congress held on June 8-11, 2014 in Orlando, FL. (May – September 2013)
- Scientific committee of the 10<sup>th</sup> International Congress on Advances in Civil Engineering, 17-19 October 2012, Ankara, Turkey. (August – December 2012)
- Organized the Crumb Rubber Modified Asphalt (CRMA) 101 Workshop, which was held at the MSU campus in February 2012.
- Served as National Science Foundation (NSF) Panel Member, Geomechanics and Geotechnical Systems (GSS), May 2010.
- Served as external technical reviewer, National Science Foundation (NSF), CAREER Awards, November 2009.
- Organized two different TRB webinars; one in September 2010 ("Applications of Advanced Models to Characterize Asphalt Pavements") and another in October 2011 ("Advanced Models to Characterize and Design Asphalt Pavements: Implementation and Application Examples")
- Served as session organizer for GeoFlorida2010 conference. (August 2009 – March 2010)
- Served as session chair in ASCE IFCEE09 conference, track: Pavement & Subgrade, Sub-base Issues. (September 2008 – March 2009)
- Member of ASCE Transportation & Development Institute (T&DI)-Highway Pavement Committee. (2006 – present)
- Associate Member of American Society of Civil Engineers (ASCE). (2003 – present)

- Member of the RILEM TG 2 Laboratory Characterization Techniques for Bituminous Mastic and Mixtures. (2009 – present)
- Friend of TRB AFD90 Surface Properties-Vehicle Interaction (2005 – present)
- Former Member of ASTM Committee E-17, Vehicle-Pavement Interactions.
- Former Member of ASTM Committee D-04, Road and Paving Materials.

**Reviewer for the following peer-reviewed journals:**

International Journal of Pavement Engineering  
ASCE Journal of Materials in Civil Engineering  
ASCE Journal of Transportation Engineering  
ASCE Journal of Engineering Mechanics  
Road Materials and Pavement Design  
International Journal of Pavement Research and Technology  
Journal of the Transportation Research Board  
Materials and Structures  
Construction and Building Materials  
Canadian Journal of Civil Engineering  
Computer Aided Civil and Infrastructure Engineering  
Journal of Geotechnical and Geoenvironmental Engineering  
International Journal of Computational Fluid Mechanics

- ASCE Geo-Institute Geotechnical Special Publications

**Reviewer for the following conferences:**

- Nags 2005 Conference, December 14-16, 2005, Las Vegas, Nevada
- 16th International Conference on Soil Mechanics and Geotechnical Engineering, Osaka, Japan, September 12-16, 2005
- 17th International Conference on Soil Mechanics and Geotechnical Engineering-Alexandria, Egypt, 5-9 October 2009
- 9th International Conference on Concrete Pavements, Haikou, Hainan, China, Dec 2-4, 2009
- GeoShanghai 2010, Shanghai, China June 3-5, 2010

**Other editorial services**

- Technical reviewer - FHWA contract reports (August 2011)
- Drafted a proposed ASTM standard: "Standard Method for Determining Aggregate Structure in Asphalt Mixes by Means of Planar Imaging". (January 2011)

**ACADEMIC ADVISING**

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*Graduate Students – Ph.D.*

1. Aksel Seitllari: Ph.D. Student, Michigan State University (7/2016 – present).
2. Yogesh Kubargeri: Ph.D. Student, Michigan State University (8/2015 – present).
3. Anas Jamrah: Ph.D. Student, Michigan State University (8/2013 – present).
4. Sudhir Varma: Ph.D. Student, Michigan State University (8/2011 – 06/2015).
5. Salih Kocak: Ph.D. Student, Michigan State University (1/2013 – 08/2016).
6. Hande Ozturk: Ph.D. Student, Michigan State University (8/2009 – 8/2013).
7. Ligang Lei: Ph.D. Student, Michigan State University (9/2008 – 6/2011). (Co-advised with Dr. Karim Chatti).
8. Duraisamy Saravanathiiban: Ph.D. Student, Michigan State University (8/2011 – 8/2014). (Co-advised with Dr. Milind Khire).

*Graduate Students – M.S.*

1. Ugurcan Ozdemir: M.S. Student, Michigan State University (8/2014 – present).
2. Sepehr Soleimani: M.S. Student, Michigan State University (8/2014 – 08/2016).
3. Jeremy Wahlstrom: M.S. Student, Michigan State University (1/2014 – present).
4. Mike Krcmarik: M.S. Student, Michigan State University (1/2013 – 12/2013).
5. Anas Jamrah: M.S. Student, Michigan State University (8/2011 – 8/2013).
6. Berkay Tascioglu: M.S. Student, Michigan State University (8/2010 – 8/2013).
7. Salih Kocak: M.S., Michigan State University (1/2009 – 8/2011).
8. Hande Ozturk: M.S., Michigan State University (8/2009 – 8/2011).
9. Raouf Mbarki: M.S., Michigan State University (9/2008 – 7/2010).

#### *Undergraduate Research Assistants*

1. Derek Hibner, B.S. Student, Michigan State University (5/2015 – present)
2. Adam Chludzinski, B.S. Student, Michigan State University (5/2014 – 8/2014)
3. Jonathon Nichols, B.S. Student, Michigan State University (9/2013 – 12/2013)
4. Laura Anderson, B.S. Student, Michigan State University (9/2013 – 12/2013)
5. Yerbol Zhakupov: B.S. Student, Michigan State University (1/2013 – 4/2013)
6. Ziwei Zhong: B.S. Student, Michigan State University (9/2012 – 12/2012)
7. Ross Simons: B.S. Student, Michigan State University (8/2012 – 12/2012)
8. Mike Krcmarik: B.S. Student, Michigan State University (9/2011 – 12/2012)
9. Ernest Schenk: B.S. Student, Michigan State University (9/2011 – 12/2012)
10. Jacob Armor: B.S. Student, Michigan State University (9/2011 – 6/2012)
11. Ronell Eisma: B.S. Student, Michigan State University (3/2011 – 6/2011)
12. Gerrit Littrup: B.S. Student, Michigan State University (6/2010 – 9/2012)
13. Adam Beach: B.S. Student, Michigan State University (6/2010 – 9/2011)
14. David Metz: B.S. Student, Michigan State University (6/2009 – 9/2009)

#### *Visiting Scholars*

1. Lin Lin, M.S. Student, National Taiwan University, (11/2012 – 5/2013)
2. Ali Ozvan, Assistant Professor, Yüzüncü Yıl University, Van, Turkey. (11/2012 – 2/2013)
3. Michele Lanotte, Visiting Scholar – Post Doc (01/2016 – present)

#### *Ph.D. Committee Memberships*

1. Pegah Rajaei (Comprehensive exam – 2015)
2. Amir Alavi (Qualifying exam – 2015)
3. Pegah Rajaei (Qualifying exam – 2014)
4. Tryambak Kaushik (Dissertation defense – 2013)
5. Hyung Suk Lee (Dissertation defense – 2013)
6. Hyung Suk Lee (Comprehensive exam – 2012)
7. Wouter Brink (Qualifying exam – 2012)
8. Tryambak Kaushik (Comprehensive exam – 2012)
9. Purushotham Pakala (Qualifying exam – 2010)
10. Baoulin Yu (Qualifying exam – 2010)
11. Imen Zabaar (Dissertation Defense – 2010)
12. Nick Brake (Qualifying exam – 2009)

#### **ADDITIONAL TRAINING**

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- An Intensive Course on Visco-Elasto-Plastic Continuum Damage Modeling of Asphalt Materials (October 2006)

- Sixth Annual Pavement/Materials and Testing Workshop for FHWA Engineers (December 2005)
- Reflective Crack Relief Workshop (September, 2005)
- An Intensive Course on Advanced Constitutive Modeling of Asphaltic Materials (January, 2005)
- Fluid Dynamics Reviews (Seminar series at the University of Maryland, October-December 2004)
- Inaugural Symposium of the Burgers Program for Fluid Dynamics (November, 2004)
- NHI Course No. 131023, Highway Materials Engineering, Module VI, Portland Cement and Concrete (July, 2004)
- 15<sup>th</sup> ACBM/NIST Computer Modeling Workshop (June, 2004)

## **COMPUTATIONAL SKILLS**

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### *Programming Languages*

- Advanced programming experience using *Matlab*. Developed numerous algorithms and softwares. Examples of major softwares are:
  - XCAT: 3D X-ray CT Analysis tool for processing of 3D X-ray CT images
  - iPas: 2D Image analysis software designed for analyzing asphalt mixture specimens.
  - 2D and 3D Lattice Boltzmann Fluid flow modeling algorithms.
  - 3D Dissipative Particle Dynamics algorithm for suspension flow.
  - 3D micromechanical compaction model for asphalt and granular materials.
  - 2D image correlation and 3D Stereo vision algorithms for determination of full-field displacement/strain distribution.
- Advanced programming experience in *LabView*
- Advanced programming experience in *Visual Basic*.

### *Software Experience*

Advanced image processing using the softwares *Image-Pro Plus*, *ImageJ* and *Amira*. Experienced with finite element modeling using *ABAQUS* and *Comsol multiphysics*.