

**SUSHOBHAN SEN**

3216 Newmark Lab, 205 N Matthews Ave, Urbana, IL 61801

+1-(502)-641-2388 ◦ [sen6@illinois.edu](mailto:sen6@illinois.edu)[sushobhansen.github.io](https://sushobhansen.github.io) ◦ [linkedin.com/in/sushobhansen](https://linkedin.com/in/sushobhansen)**EDUCATION****University of Illinois at Urbana-Champaign***Doctor of Philosophy in Civil Engineering*

Program: Transportation Engineering

Urbana, IL

2018 (expected)

*GPA: 4.0/4.0***University of Illinois at Urbana-Champaign***Master of Science in Civil Engineering*

Program: Transportation Engineering

Urbana, IL

August, 2015

*GPA: 4.0/4.0***Indian Institute of Technology Roorkee***Bachelor of Technology*

Major: Civil Engineering

Roorkee, India

May, 2013

*GPA: 9.5/10.0**Institute Silver Medal***COMPUTER SKILLS****Software**

AASHTO Pavement ME, OpenFOAM, AutoCAD Civil

3D, ANSYS FLUENT, Mathematica, MATLAB

**Languages**

C/C++/C#, Python, Excel VBA, HTML/CSS/JS

**RESEARCH AND EXPERIENCE***University of Illinois at Urbana-Champaign***CEE Transportation Instructional Fellow**

January, 2017 - May, 2017

Instructor for CEE 415: Geometric Design of Roads, a class of 55 graduate and undergraduate students. Delivered lectures, made and graded homework, exams, and project reports, taught AutoCAD Civil 3D, and held regular office hours. Rated 4.1 out of 5 in anonymous student feedback.

**Graduate Teaching Assistant**

January, 2016 - May, 2016

TA for CEE 415: Geometric Design of Roads, a class of 68 graduate and undergraduate students. Made and graded homework, exams, and project reports, while also holding regular office hours and teaching AutoCAD Civil 3D. Delivered lectures in the instructors absence. Rated 4.3 out of 5 in anonymous student feedback.

**Role of Pavements in Urban Energetics**

August, 2015 - Present

Doctoral dissertation on the assessment of the local microclimatic impact of pavements on urban areas for improved sustainability. Research included the thermal and optical characterization of pavement materials and the study of wind flow within cities using Computational Fluid Dynamics (CFD).

**Impact of Concrete Pavements on Urban Heat Island**

August, 2013 - August, 2015

Master's thesis on the determination of the impact of pavement surface and sub-surface structure and materials on the urban heat island. Research included the development of a 1D pavement heat transfer program and the assessment of albedo of concrete using both field and lab techniques.

*Technical University Munich, Germany*

**Image-Assisted Total Station**

May, 2012 - July, 2012

Summer research internship on integrating the subsystems of an Image-Assisted Total Station (IATS) and calibrating it using image processing algorithms and least squares fitting. Included development of a C++ program to control the IATS subsystems and calibration from laboratory tests.

**REPORTS AND PUBLICATIONS***Peer-Reviewed Journal Articles*

- (J1) **Sen, S.**, and Roesler, J. (2017) *Albedo estimation of finite-sized concrete specimens*. ASTM Journal of Testing and Evaluation, *In Press*
- (J2) **Sen, S.**, and Roesler, J. (2017) *Microscale Heat Island Characterization of Rigid Pavements*. Transportation Research Record: Journal of the Transportation Research Board, No. 2639, pp. 73-83, doi: [10.3141/2639-10](https://doi.org/10.3141/2639-10)
- (J3) **Sen, S.**, and Roesler, J. (2016) *Aging albedo model for asphalt pavements*. Journal of Cleaner Production, Vol. 117, pp. 169-175, doi: [10.1016/j.jclepro.2016.01.019](https://doi.org/10.1016/j.jclepro.2016.01.019)
- (J4) **Sen, S.**, and Roesler, J. (2016) *Contextual Heat Island Assessment for Pavement Preservation*. International Journal of Pavement Engineering, *In Press*, doi: [10.1080/10298436.2016.1213842](https://doi.org/10.1080/10298436.2016.1213842)

*Peer-Reviewed Conference Papers*

- (C1) **Sen, S.**, and Roesler, J. (2017) *Pavement Geometry in Microscale Urban Heat Islands*. Conference of the Transportation Association of Canada, St. Johns, NL, Canada ([link](#))
- (C2) **Sen, S.**, Baral, A., and Roesler, J. (2017) *Use-phase sustainability through preservation*. 10<sup>th</sup> International Conference on Road and Airfield Pavement Technology, Hong Kong

- (C3) **Sen, S.**, and Roesler, J. (2017) *An uncoupled pavement-urban canyon model for heat islands*. International Symposium on Pavement Life Cycle Assessment, Champaign, IL, ISBN 978-1-315-15932-4, pp. 111-120, doi: [10.1201/9781315159324-13](https://doi.org/10.1201/9781315159324-13)
- (C4) **Sen, S.**, and Roesler, J. (2016) *Albedo as an engineering property of concrete pavements*. 11<sup>th</sup> International Conference on Concrete Pavements, San Antonio, TX, ISBN 978-0-9860291-2-7, pp. 59-71
- (C5) King, D., Roesler, J., and **Sen, S.** (2016) Emissions reducing benefits of multi-functional photocatalytic concrete inlays. 11<sup>th</sup> International Conference on Concrete Pavements, San Antonio, TX, ISBN 978-0-9860291-2-7, pp. 72-81
- (C6) **Sen, S.**, King, D., and Roesler, J. (2015) Structural and Environmental Benefits of Concrete Inlays for Pavement Preservation. Airfield and Highway Pavements 2015, Miami, FL, pp. 697-707, doi: [10.1061/9780784479216.062](https://doi.org/10.1061/9780784479216.062)
- (C7) **Sen, S.**, and Roesler, J. (2014) *Assessment of Concrete Pavement Structure on Urban Heat Island*. International Symposium on Pavement Life Cycle Assessment, Davis, CA, pp. 191-200 ([link](#))

### Reports

- (R1) **Sen, S.** (2015) *Impact of concrete pavements on the Urban Heat Island*. University of Illinois at Urbana-Champaign, Urbana, IL. Masters Thesis
- (R2) Méndez-Ruiz, J.P., Roesler, J., and **Sen, S.** (2015) *Determining the albedo of small cement mortar specimens using view factors*. Report for the Research Experiences for Undergraduates (REU) Program, University of Illinois at Urbana-Champaign, Urbana, IL
- (R3) Méndez-Ruiz, J.P., Roesler, J., and **Sen, S.** (2015) *Temporal and spatial distribution of albedo in UIUC parking lots*. Report for the Research Experiences for Undergraduates (REU) Program, University of Illinois at Urbana-Champaign, Urbana, IL

### Proposals

- (P1) *Multi-Functional Concrete Inlays* (2014) Proposal to the University Transportation Center for Highway Pavement Preservation. PI: Roesler, J. Approved
- (P2) *Fatigue and Fracture of Fiber Reinforced Cementitious Bonded Overlay for Asphalt Pavement Preservation* (2015) Proposal to BASF GmbH. PI: Roesler, J. RFP withdrawn

## CONFERENCE PARTICIPATION

- (1) 6<sup>th</sup> International Transportation PhD Student Symposium, October 20-21, 2017, Urbana, IL
- (2) Conference of the Transportation Association of Canada, September 24-27, 2017, St. Johns, NL, Canada

- (3) 10<sup>th</sup> International Conference on Road and Airfield Pavement Technology, August 8-10, 2017, Hong Kong
- (4) 4<sup>th</sup> Joint Laboratory for Extreme-Scale Computing (JLESC) Summer School, July 20-21, 2017, Urbana, IL
- (5) International Symposium on Pavement Life Cycle Assessment, April 12-13, 2017, Champaign, IL
- (6) 103<sup>rd</sup> Illinois Transportation and Highway Engineering Conference, February 28-March 1, 2017, Urbana, IL
- (7) 96<sup>th</sup> Annual Meeting of the Transportation Research Board, January 8-12, 2017, Washington, DC
- (8) 11<sup>th</sup> International Conference on Concrete Pavements, August 28-31, 2016, San Antonio, TX
- (9) International Concrete Sustainability Conference, May 15-18, 2016, Washington, DC
- (10) 102<sup>nd</sup> Illinois Transportation and Highway Engineering Conference, February 23-24, 2016, Urbana, IL
- (11) 95<sup>th</sup> Annual Meeting of the Transportation Research Board, January 10-14, 2016, Washington, DC
- (12) Center for Highway Pavement Preservation Symposium, July 22, 2015, East Lansing, MI
- (13) Advanced Materials Characterization Workshop, June 2-3, 2015, Urbana, IL
- (14) 101<sup>st</sup> Illinois Transportation and Highway Engineering Conference, February 24-25, 2015, Urbana, IL
- (15) 94<sup>th</sup> Annual Meeting of the Transportation Research Board, January 11-15, 2015, Washington, DC
- (16) International Symposium on Pavement Life Cycle Assessment, October 14-16, 2014, Davis, CA

## PRESENTATIONS

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### *Seminars*

- (1) **Sen, S.** (2016) *Challenges in Measuring Pavement Albedo*. The Kent Seminar Series, Advanced Transportation Research and Engineering Laboratory (ATREL), University of Illinois at Urbana-Champaign, October 6, 2016, Rantoul, IL
- (2) **Sen, S.** (2015) *Albedo for Pavement Engineers*. The Kent Seminar Series, Advanced Transportation Research and Engineering Laboratory (ATREL), University of Illinois at Urbana-Champaign, December 3, 2015, Rantoul, IL

- (3) **Sen, S.** (2014) *A Bottom-Up Approach to Urban Heat Islands: Background and Challenges*. The Kent Seminar Series, Advanced Transportation Research and Engineering Laboratory (ATREL), University of Illinois at Urbana-Champaign, October 23, 2014, Rantoul, IL

#### *Conference Presentations*

- (1) **Sen, S.** (2017) *Pavement Albedo Distribution and its Impact on Microscale Heat Island Characterization*. TRB Subcommittee AFD00(2) meeting, 96<sup>th</sup> Annual Meeting of the Transportation Research Board, January 9, 2017, Washington, DC
- (2) **Sen, S.** (2016) *Multi-Functional Concrete Inlays for Pavement Preservation and Sustainability*. International Concrete Sustainability Conference, May 15, 2016, Washington, DC
- (3) **Sen, S.** (2016) *Contextual Life Cycle Assessment Framework for Pavement Preservation*. TRB Subcommittee AFD00(2) meeting, 95<sup>th</sup> Annual Meeting of the Transportation Research Board, January 14, 2016, Washington, DC

#### *Poster Presentations*

- (1) **Sen, S.** (2017) *Assessment of the Urban Microclimatic Impact of Pavements*. 6<sup>th</sup> International Transportation PhD Student Symposium, October 21, 2017, Urbana, IL
- (2) **Sen, S.** (2017) *Pavement Albedo Distribution and its Impact on Microscale Heat Island Characterization*. 96<sup>th</sup> Annual Meeting of the Transportation Research Board, January 10, 2017, Washington, DC
- (3) **Sen, S.** (2017) *Analyzing the Role of Concrete Pavements in Urban Energetics*. 11<sup>th</sup> International Conference on Concrete Pavements, August 28, 2016, San Antonio, TX
- (4) **Sen, S.** (2015) *Multi-Functional Concrete Inlays*. Center for Highway Pavement Preservation Symposium, July 22, 2015, East Lansing, MI
- (5) **Sen, S.** (2015) *Impact of Thermal Inertia in Pavements and the Urban Heat Island*. 94<sup>th</sup> Annual Meeting of the Transportation Research Board, January 13, 2015, Washington, DC
- (6) **Sen, S.** (2014) *Assessment of Concrete Pavement Structure on Urban Heat Island*. International Symposium on Pavement Life Cycle Assessment, October 14, 2014, Davis, CA

## **HONORS AND AWARDS**

#### *Illinois Center for Transportation*

#### **PhD Student Symposium Award (2<sup>nd</sup> place)**

October, 2017

Awarded second place for poster and presentation on *Assessment of the Urban Microclimatic Impact of Pavements* at the 6<sup>th</sup> International Transportation PhD Student Symposium, Urbana, IL.

*International Society for Concrete Pavements*

**Bengt F. Friberg Award for Best Paper by a Young Author** August, 2016  
Awarded for the paper on *Albedo as an Engineering Property of Concrete Pavements* at the 11<sup>th</sup> International Conference on Concrete Pavements, San Antonio, TX.

*University of Illinois at Urbana-Champaign*

**Mavis Future Faculty Fellowship** August, 2017 - July, 2018  
Awarded a competitive fellowship in the College of Engineering to train top graduate students for a future career in academia.

**CEE Transportation Instructional Fellowship** January, 2017 - May, 2017  
Awarded an instructional fellowship to teach CEE 415 Geometric Design of Roads in the Spring 2017 semester.

**Ravindar K and Kavita Kinra Fellowship** August, 2013 - July, 2014  
Awarded a fellowship in the Department of Civil and Environmental Engineering to explore a new area of research.

*Indian Institute of Technology Roorkee*

**Institute Silver Medal and Other Honors** October, 2013  
Awarded the Institute Silver Medal and other honors for graduating with the highest GPA in the B.Tech (Civil Engineering) Class of 2013.

*The OP Jindal Group, India*

**OP Jindal Engineering and Management Scholarship** December, 2012  
Awarded a competitive national scholarship for excellence in engineering education and community service.

*German Academic Exchange Service (DAAD), Germany*

**WISE Scholarship** May, 2012 - July, 2012  
Awarded a competitive Working Internships in Science and Engineering (WISE) scholarship to pursue summer research at Technical University Munich.

*National Council of Educational Research and Training (NCERT), India*

**NTSE Scholarship** May 2007, - May, 2013  
Awarded a competitive National Talent Search Exam (NTSE) Scholarship from the Government of India for high school and undergraduate studies.

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**LEADERSHIP AND SERVICE**

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*International Society for Concrete Pavements***Webmaster and student member**

July, 2015 - Present

Assisted in the preparation of conference proceedings and flash drive for the 11<sup>th</sup> International Conference on Concrete Pavements, San Antonio, TX organized by ISCP. Regularly assist in the maintenance of the [ISCP website](#).

*University of Illinois at Urbana-Champaign***ITE UIUC Student Chapter**

August, 2015 - August, 2017

Secretary of the Institute of Transportation Engineers (ITE) Student Chapter. Responsibilities included overhauling and regularly updating the [website](#), sending emails, maintaining the mailing list, and taking pictures at events.

**IGSA at UIUC**

August, 2013 - Present

Elected President of the Indian Graduate Students Association (IGSA) at UIUC from August, 2014 - August, 2015 and webmaster from August, 2015 - Present. Responsibilities included overhauling and regularly updating the [website](#), chairing board meetings, handling external relations, and supervising the organization of various events on campus.

**ASCE T&DI UIUC Student Chapter**

August, 2016 - August, 2017

Outreach Chair at the ASCE Transportation & Development Institute (T&DI) UIUC Student Chapter. Responsibilities included organizing a successful field trip to a local readymix concrete plant.

**ACI UIUC Student Chapter**

August, 2013 - Present

Student member of the American Concrete Institute (ACI) UIUC Student Chapter. Participate annually in the Chapter's Engineering Open House booth.

*Japan International Cooperation Agency***The Kizuna Project**

February 13-19, 2013

Participated in a two-week exchange program to visit and assess tsunami-affected areas in northeastern Japan, specifically the village of Minamisanriku. Presented findings and recommendations on behalf of my teammates to JICA and local representatives.

*Indian Institute of Technology Roorkee***The Literary Section**

July, 2012 - May, 2013

Additional Secretary in-charge of the English Debating Society. Responsibilities included holding weekly debates, liaising with faculty adviser, the training new members, leading the university contingent at inter-university tournaments, and organizing IIT Roorkee's

debating tournament, *Vox Populi*.

**Kshitij: The Official Student Literary Magazine**

August, 2011 - May, 2012

Executive Editor on the English Editorial Desk. Responsibilities included training new writers, editing submissions, writing literature, and assisting with typesetting.