



Zhao DU

As you set out for Ithaca, hope your road is a long one, full of adventure, full of discovery.

Education Experience

- 2021–Present **Guest Ph.D**, *Technical University of Denmark, Copenhagen*
Funded by China Scholarship Council (CSC)
- 2018–Present **Ph.D candidate**, *Tongji University, Shanghai, GPA:4.64/5.0*
Major in electronics and information engineering
Research orientation: **crowdsensing-based road surface condition perception**
- 2018–2019 **Nanodegree**, *Udacity, Online*
Self-driving car engineering
- 2015–2018 **ME**, *Tongji University, Shanghai, GPA:3.92/5.0*
Major in traffic engineering(road and airport engineering)
Dissertation: Numerical simulation research on moisture damage of asphalt-aggregate interface(in Chinese)
- 2015–2016 **Masters' Minor**, *UNEP-Tongji Institute of Environment for Sustainable Development, Shanghai*
Major in green transport and sustainability
- 2011–2015 **BE**, *Chang'an University, Xi'an, GPA:3.68/4.0*
Major in material science and engineering(materials in road and airport engineering)

Honours

- Mar. 2022 The 1st International Competition on Intelligent Simulation of Transportation Infrastructure, Second Price Award/Best Poster Award
- Jan. 2022 IACIP Outstanding Graduate Student Award, Second Price
- Nov. 2021 Outstanding Student Award of Tongji University
- Oct. 2021 China National Scholarship
- Oct. 2021 Priority Research Application Contest, Silver Medal (Quantum Computing Channel)
- Oct. 2020 Excellent Application Award of National Supercomputer Center (20/300)
- Oct. 2019 Guanghua Scholarship
- Sep. 2017 China National Scholarship
- Oct. 2016 Shanghai Innovation & Entrepreneurship Competition, Silver Medal
- Oct. 2014 China National Endeavor Scholarship (2012, 2013 and 2014 three times in a row)

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Dec. 2013 China Mathematical Contest in Modeling, second price (Shaanxi division)

Publications

- 2021 **Du,Z.**, Zhu,X., Asmus Skar.(2021). A transfer learning approach to road roughness assessment using calibration-free vehicle dynamic response.(Under review).
- 2021 **Du,Z.**,&Zhu, X..(2021). Surface-roughness-induced control of the interfacial failure mode and bonding strength:an atomistic case study in an asphalt-aggregate system.(Under review).
- 2022 Zhu, X., Zhang, Q., **Du, Z.**, Wu, H., &Sun, Y.(2022). Snow-melting pavement design strategy with electric cable heating system balancing snow melting, energy conservation, and mechanical performance. *Resources, Conservation and Recycling*, 177, 105970.<https://doi.org/10.1016/j.resconrec.2021.105970>
- 2021 Zhu, X., Zhou, X., Ye, F., Wu, H., &**Du, Z.** (2021). Development and evaluation of cement/emulsified-asphalt based piezoelectric sensors for road weigh-in-motion system. *Smart Materials and Structures*.<https://doi.org/10.1088/1361-665X/ac319f>
- 2021 Zhu, X., Li, W., &**Du, Z.**, Zhou, S., Zhang, Y., &Li, F.(2021). Recycling and utilization assessment of steel slag in metakaolin based geopolymer from steel slag by-product to green geopolymer. *Construction and Building Materials*, 305, 124654.<https://doi.org/10.1016/j.conbuildmat.2021.124654>
- 2021 Zhu,X., Zhou,X., Ye,F.,&**Du,Z.**(2021). Prototype design of cement/emulsified asphalt based piezoelectric composites and its potential application in vehicle speed sensing.*Transportation Research Record*,03611981211004580,<https://doi.org/10.1177/03611981211004580>
- 2021 **Du,Z.**, Zhu, X.,&Yuan, Y.(2021). Molecular investigation on the adhesion and deformation behaviors of asphalt binder under nanoindentation. *Construction and Building Material*, 295, 123683. <https://doi.org/10.1016/j.conbuildmat.2021.123683>
- 2020 Zhu,X., Zhang,Q., Chen,L.,&**Du,Z.**(2020). Mechanical response of hydronic asphalt pavement under the temperature-vehicle coupled load: a FE simulation and accelerated pavement testing study.*Construction and Building Material*, 272, 121884. <https://doi.org/10.1016/j.conbuildmat.2020.121884>
- 2020 Zhu, X., **Du,Z.**, Ling, H., Chen, L.,&Wang, Y.(2020). Effect of filler on thermodynamic and mechanical behaviour of asphalt mastic: a MD simulation study.*International Journal of Pavement Engineering*, 21(10), 1248-1262. <https://doi.org/10.1080/10298436.2018.1535120> (ESI 1%)
- 2020 **Du,Z.**, Zhu, X.,&Zhang, Y.(2020). Diffusive dynamics and structural organization of moisture in asphaltic materials based on molecular dynamics simulation. *Journal of Materials in Civil Engineering*, 33(1), 04020403. [https://doi.org/10.1061/\(ASCE\)MT.1943-5533.0003495](https://doi.org/10.1061/(ASCE)MT.1943-5533.0003495)

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- 2020 **Du,Z.**, Zhu,X., Li,F., Zhou,S.,&Dai,Z.(2020). Failure of the asphalt–aggregate interface under tensile stress: insight from molecular dynamics. *Journal of Materials in Civil Engineering*, 33(3), 04021008. [https://doi.org/10.1061/\(ASCE\)MT.1943-5533.0003601](https://doi.org/10.1061/(ASCE)MT.1943-5533.0003601)
- 2019 **Du,Z.**,&Zhu, X.(2019). Molecular dynamics simulation to investigate the adhesion and diffusion of asphalt binder on aggregate surfaces. *Transportation Research Record*, 2673(4), 500-512. <https://doi.org/10.1177/0361198119837223>
- 2017 Zhu, X.,**Du,Z.**, Cai, Y.,&Li, F.(2017). Performance Evaluation and Technical Requirement of Interlayer Stress Absorbing Composite Sticker (ISACS) for Mitigating Reflective Cracking in Asphalt Concrete Overlays. *Journal of Testing and Evaluation*, 45(4), 1289-1300. <https://doi.org/10.1520/JTE20150490>

Proceedings

- Jan. 2022 **Du,Z.**, Zhu,X.*, Asmus Skar.(2022). A transfer learning approach to road roughness assessment using calibration-free vehicle dynamic response. *Transportation Research Board(TRB)*, Washington D.C.(Accepted, poster session).
- Jan. 2021 Zhu,X., Zhou,X., Ye,F.,&**Du,Z.***(2021). Optimal design of cement/emulsified-asphalt based piezoelectric composites and its potential application in vehicle speed sensing. *Transportation Research Board(TRB)*, Washington D.C.(Accepted, poster session).
- Jan. 2021 Zhu,X., Li,W., Li,F., Zhang,Y.,&**Du,Z.***(2021). Recycling and utilization assessment of steel slag waste in metakaolin based geopolymer. *Transportation Research Board(TRB)*, Washington D.C.(Accepted, poster session).
- Jan. 2021 Zhu,X., Zhang,Q.,&**Du,Z.***(2021). Design of snow-melting pavement with electric cable heating system aiming at optimum mechanical and long-term performance. *Transportation Research Board(TRB)*, Washington D.C.(Accepted, poster session).
- Jan. 2019 **Du,Z.**&Zhu, X.*(2019). Molecular Dynamics simulation to investigate the adsorption and diffusion of asphalt binder on aggregate surfaces, *Transportation Research Board(TRB)*, Washington D.C.(Poster session)
- Jan. 2017 Zhu, X.*, **Du,Z.** Cai, Y.,&Li, F. (2017). Laboratory experimental research on the mechanical properties of waterproofing adhesive layer(WAL) for steel bridge deck, *Transportation Research Board(TRB)*, Washington D.C.(Lectern session)

Skills&Language

English	Intermediate(IELTS band 7.0)	L:7.5 R:8.0 W:6.5 S:5.5
Japanese	Basic	Self-teaching
Coding	Intermediate	Matlab, Python, and C++
Modeling	Intermediate	CAD;ArcGIS;FEM:ABAQUS;MD:Lammps,Material Studio

Review Service

- 2017–Present Transportation Research Board (AKP10, AKT10, AKP50, and AKM20)
- 2020–Present Construction and Building Materials, Journal of Materials in Civil Engineering

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Volunteering

- Oct. 2019 The 4th International Symposium on Frontiers of Road and Airport Engineering (iFRAE), Shanghai
- Oct. 2018 World Artificial Intelligence Conference (WAIC), Shanghai
- 2015, 2016 Google Developer Group, Shanghai.

Extracurricular Experience

- Jul–Sep.2017 Shanghai Urban Construction Design&Research General Institute, Shanghai
 - Participated in Songze viaduct west extension project, Taopu technology smart city road engineering project and Chongming jianshe highway project
 - Proficiency of the basic professional work and procedure of designer, especially municipal pavement designer.
- Jul.2015, Guizhou Transportation Planning Survey&Design Academe CO.LTD, Guizhou
- Dec.2016
 - Field research on the pavement construction of the Beipanjiang and Dimuhe Bridge
 - Laboratory research on the performance of materials which was finally adopted in Beipanjiang and Dimuhe Bridge
 - Data analysis and research report writing

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