

# Geng Niu

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Carbon Capture Utilization and Storage, 3D Printed Concrete

## EDUCATION

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### Duke University

- Ph.D. Student in Civil and Environmental Engineering 2024 - present  
(Advisor: Prof. Laura Elizabeth Dalton)

### Southeast University, China

- M.S. in Material Science and Engineering 2021 - 2024
- B.S. in Material Science and Engineering 2017 - 2021

## RESEARCH EXPERIENCES

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### Dalton's Lab, Duke University

2024 - present

Advisor: Prof. Laura E. Dalton

Research Topics: Carbon Capture Utilization and Storage, 4D Imaging

### Jiangsu Key Laboratory of Construction Materials, Southeast University

2018 - 2024

Advisor: Prof. Yamei Zhang

Research Topics: 3D printed concrete, Low-density concrete

## PUBLICATIONS

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**Journal Articles** († indicates co-first author, \* indicates correspondent author)

1. Lutao Jia, Enlai Dong, Kailun Xia, **Geng Niu**, Zijian Jia, Hanquan Yuan, Yueyi Gao, Yamei Zhang\*. (2025). Initial plastic shrinkage of 3D-printed concrete incorporating recycled brick fine aggregates: Insights from water transport and structural evolution. *Journal of Building Engineering*, 106, 112665. [[doi](#)]
2. Lutao Jia, **Geng Niu**, Enlai Dong, Yifan Jiang, Xianggang Wang, Zijian Jia, Wei Wang, Yueyi Gao, Yamei Zhang\*. (2024). Optimization strategy for incorporating recycled brick powder in 3D-printed concrete by balancing low carbon footprint and enhanced performance. *Construction and Building Materials*, 443, 137801. [[doi](#)]
3. **Geng Niu**, Chao Liu, Lutao Jia, Lei Ma, Yifan Shi, Yifan Jiang, Zijian Jia, Yu Chen, Nemkumar Banthia, Yamei Zhang\*. (2024). Preparation and Performance Analysis of 3D Printed Lightweight EPS Concrete: Insights from the Excess Paste Theory. *Cement and Concrete Composites*, 149, 105509. [[doi](#)]
4. Lei Ma, Qing Zhang, Hélène Lombois-Burger, Zijian Jia, Zedi Zhang, **Geng Niu**, Yamei Zhang\*. (2022). Pore Structure, Internal Relative Humidity, and Fiber Orientation of 3D Printed Concrete with Polypropylene Fiber and Their Relation with Shrinkage. *Journal of Building Engineering*, 61, 105250. [[doi](#)]
5. Chao Liu, Yuning Chen, Zedi Zhang, **Geng Niu**, Yuanliang Xiong, Lei Ma, Qi Fu, Chun Chen, Nemkumar Banthia, Yamei Zhang\*. (2022). Study of the Influence of Sand on Rheological Properties, Bubble Features and Buildability of Fresh Foamed Concrete for 3D Printing. *Construction and Building Materials*, 356, 129292. [[doi](#)]

**Manuscripts Drafted and Under Preparation**

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6. **Geng Niu**, Manolis Veveakis, Laura Elizabeth Dalton\*. (in prep). Mechanical Performance of Accelerated Carbonated.

### **Contributed Conference Presentations** (underline: presenter)

7. **Geng Niu**, Laura Elizabeth Dalton\*. (2025). Exploration of carbon capture in mortar. InterPore2025, 19-22 May, Albuquerque, New Mexico, USA.
8. **Geng Niu**, Laura Elizabeth Dalton\*. (2025). Exploration of carbon capture in mortar. 2025 SympoCEEum, 4-5 April, Durham, North Carolina, USA.

## **HONORS & AWARDS**

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- |  |             |
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| • Chunmei Zhang Scholarship, Southeast University            | 2024        |
| • First-Class Postgraduate Scholarship, Southeast University | 2021        |
| • Changwen Miao Scholarship, Southeast University            | 2019 - 2020 |

## **PROFESSIONAL EXPERIENCES**

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### **Teaching Assistant**

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| • Cement Chemistry, Southeast University | 2022 |
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### **Equipment Operator & Data Analyst**

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|---|----------------|
| • Anton Paar XRDynamic 500, X-Ray Diffractometer, Duke University   | 2025 - present |
| • SDT 650, Simultaneous thermal analyzer, Duke University           | 2025 - present |
| • TESCAN UniTOM XL, X-ray tomography scanner, Duke University       | 2025 - present |
| • Y.CT precision, X-ray tomography scanner, Southeast University    | 2022 - 2024    |
| • Zeiss Xradia 510 Versa, 3D X-ray microscope, Southeast University | 2022 - 2024    |

### **Memberships**

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| • American Society of Civil Engineers (ASCE) | 2024 - present |
| • American Concrete Institute (ACI)          | 2024 - present |
| • The American Ceramics Society (ACerS)      | 2024 - present |

**Invited Talk**

**Book Chapters**

**Software Development**