

STEPHEN TIMOTHY GORDON II

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PROFESSIONAL SUMMARY

Ph.D. in Engineering and Instructor of Record with interdisciplinary expertise in electrical engineering, materials science, and civil engineering. Research focuses on geopolymers, additive manufacturing, and electrical curing methods for sustainable construction. Developed and delivered undergraduate engineering courses across six terms (300+ students). Author of six peer-reviewed journal articles, two conference proceedings, and one book chapter, with a tenth manuscript under review, including two as first author. EIT licensed in Louisiana; proficient in Python, MATLAB, and LLM/RAG pipelines for engineering document analysis.

EDUCATION

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| Louisiana Tech University
<i>Ph.D. in Engineering - Concentration: Materials and Infrastructure Systems</i> | Ruston, LA
2021 – May 2026 |
| <ul style="list-style-type: none">Dissertation: <i>Additive Manufacturing Using Fly-Ash-Based Geopolymer Cement Cured by Ohmic Heating</i>Advisor & Committee Chair: Dr. Shaurav AlamCommittee: Dr. Sven Eklund, Dr. John Matthews, Dr. David Hall, Dr. Joan Lynam | |
| Louisiana Tech University
<i>M.S. in Engineering (MSE): Electrical Engineering</i> | Ruston, LA
2021 – 2025 |
| Louisiana Tech University
<i>B.S. in Electrical Engineering, Minor in Mathematics</i> | Ruston, LA
2017 – 2021 |

CERTIFICATIONS & LICENSURE

- Engineer in Training (EIT), State of Louisiana (2022)
- FCC Technician Class Amateur Radio Operator, KG5RLJ (active)

PROFESSIONAL EXPERIENCE

Instructor of Record

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| ENGR 1222: Engineering Problem Solving III
<i>Louisiana Tech University</i> | Mar 2026 – May 2026
<i>Ruston, LA</i> |
| <ul style="list-style-type: none">Delivered lectures and laboratory instruction in electromechanical systems, engineering design, fabrication techniques, technical communication, and engineering economics | |
| CVEN 3023: Construction and Building Materials
<i>Louisiana Tech University</i> | Mar 2023 – May 2026
<i>Ruston, LA</i> |
| <ul style="list-style-type: none">Six terms (259 students): Spring 2023, Winter 2023–24, Spring 2024, Winter 2024–25, Spring 2025, and Winter 2025–26Developed and delivered undergraduate construction materials course covering concrete mix design, geopolymers, thermal expansion, electromechanical sensors, steel/concrete construction, ASTM testing for wood, plastics, and compositesDesigned and supervised ASTM-standard laboratory activities (C39, C136, C127, C128, D638, D790, D256); prepared assessment data supporting ABET 2026 accreditation for the Civil Engineering (CVEN) and Construction Engineering Technology (CET) programs | |
| Graduate Research Assistant
<i>Louisiana Tech University - College of Engineering & Science</i> | 2021 – 2026
<i>Ruston, LA</i> |
| <ul style="list-style-type: none">Developed a prototype 3D printing system using ohmic heating to cure Class F fly ash geopolymer mixes, expanding the practical curing envelope for cementitious binders | |

- Performed SEM and XRF characterization of Class C and F fly ash; executed ASTM mechanical testing (C39, C78, C496)
- Designed and tested geopolymer alkali battery systems using graphite conductive admixtures for smart self-sensing structural infrastructure
- Performed creep, flexural, and tensile analysis of cured-in-place pipe (CIPP) liner samples for water infrastructure rehabilitation
- Built a Searle's apparatus to evaluate halloysite nanotube (HNT) insulating coatings; demonstrated reduced thermal conductivity and improved thermal energy storage
- Assisted faculty supervisor with preparation and submission of external research proposals; elected Vice President (2025) and Treasurer (2024) of the Graduate Student Council
- Presented research at NASTT No-Dig (2022–2024), World of Coal Ash (2024), and the International Net-Zero Future Conference, Oslo, Norway (2024, sole presenter on self-arranged international travel)

Graduate Teaching Assistant

2021 – 2026

Louisiana Tech University

Ruston, LA

- **ENGT 2202** - Applied Engineering Mechanics (Fall 2021, 2022): lectures, labs, exam proctoring, and student support in engineering mechanics and statics
- **CVEN 3023** - Construction and Building Materials (Winter 2021–22; Spring 2022; Winter 2022–23): laboratory instruction, course material preparation, and student mentoring
- **CVTE 4753** - Soils in Construction (Fall 2023, 2024, 2025): laboratory supervision, grading, and student office hours

3D Printer Technician - Prototyping Laboratory

2019 – 2020

Louisiana Tech University

Ruston, LA

- Maintained and operated FDM and SLA systems (MakerBot, Creality, Anycubic, Kywoo); designed parts in SolidWorks and Fusion 360; prepared print files with Cura, ChituBox, and PrusaSlicer

TECHNICAL SKILLS

Programming & Computing: Python (data analysis, automation, machine vision), MATLAB (signal processing, image processing), VHDL, C, 6502 Assembly

Engineering Software & CAD: SolidWorks (including FEA - static and thermal), Autodesk Fusion 360, LTspice, EAGLE CAD, Arena System Simulation, Mathcad, Inkscape

Laboratory & Materials Testing: Geopolymer synthesis and characterization, ASTM mechanical testing (compression, flexure, tensile, impact), SEM, XRF, rheological analysis, electrical and ohmic characterization, thermal conductivity measurement, PCB design and fabrication

Additive Manufacturing: FDM and SLA system operation, maintenance, and custom development; geopolymer extrusion system design; slicing (Cura, ChituBox, PrusaSlicer, MakerBot Print)

Web & Systems: Linux administration, Docker, Nginx reverse proxy, Cloudflare DNS, SSL/HTTPS, Joomla CMS, HTML/CSS (self-hosted stephentgordonii.com)

Machine Learning & AI: Self-hosted offline LLM deployment (Unraid Linux homelab); retrieval-augmented generation (RAG); text-embedding models; applied inference pipelines for engineering document analysis

RESEARCH & ENGINEERING PROJECTS

Ohmic-Curing 3D Printer for Geopolymer Concrete | 2021–2026

Louisiana Tech

- Designed and built a prototype additive manufacturing system embedding ohmic electrodes in the print head to cure fly-ash-based geopolymer paste in real time, reducing set time from hours to minutes
- Characterized electrical conductivity and mechanical strength vs. curing parameters; submitted to Ain Shams Engineering Journal

Geopolymer Curing Transient Thermal Analysis | 2022–2024 Louisiana Tech

- Performed transient thermal finite element analysis in SolidWorks comparing ohmic and convection curing envelopes of geopolymer cementitious materials, including skin-effect and analytical thermal-power modeling

Electrical Characterization of Cementitious Materials | 2021–2026 Louisiana Tech

- Developed experimental framework for electrical conductivity and resistivity measurement of fresh and cured geopolymer mixes at multiple activation stages; contributed to 4 peer-reviewed publications

Geopolymer Alkali Battery for Smart Infrastructure | 2022–2024 Louisiana Tech

- Demonstrated proof-of-concept geopolymer battery using graphite conductive admixtures, targeting embedded self-sensing and energy harvesting in structural elements

MATLAB Machine Vision for Surface Porosity | 2023–2024 Louisiana Tech

- Developed MATLAB image processing pipeline for non-destructive estimation of surface porosity in hardened concrete specimens, enabling rapid quality assessment without destructive sectioning

Additional Projects | 2019–present Louisiana Tech

- Self-hosted LLMs with RAG inference for engineering document analysis
- Hardware implementation of PID temperature control and microcontroller-based salinity/temperature control systems
- APRS high-altitude weather balloon tracking, chase-and-recovery, and long-range mesh communication network testing

SELECTED PUBLICATIONS

Peer-Reviewed Journal Articles

Paneru, A., Sagar, V., Tarikuzzaman, M., Lynam, J.G., **Gordon II, S.T.**, & Alam, S. (2024). Innovative Pavement Materials: Utilizing Corn Stover and Fly Ash in Geopolymers. *Environments*, 11(192). doi:10.3390/environments11090192

Tarikuzzaman, M., Shank, A.M., Agan, E.G., Sagar, V., Lynam, J.G., **Gordon II, S.T.**, & Alam, S. (2024). Tensile Strength and Porosity of Regolith-Based Cement with Human Hair. *Frontiers in Space Technologies*, 5. doi:10.3389/frspt.2024.1448787

Tarikuzzaman, M., **Gordon, S.T.**, Alam, S., & Lynam, J.G. (2024). Direct Contact Membrane Distillation of Artificial Urine and Its Application in Plasticizing Lunar Regolith. *Recycling*, 9(5), 89. doi:10.3390/recycling9050089

Islam, M.R., Lynam, J.G., Eklund, S.E., Alam, S., Santiago, A.V., II, Nan, N., & **Gordon, S.T.** (2024). Loblolly Pine Needles Processing with Deep Eutectic Solvents to Develop Porous Structure. *Bioinspired, Biomimetic and Nanobiomaterials*, 13(3–4), 69–80. doi:10.1680/jbibn.24.00001

Hashm, H., Alam, S., **Gordon, S.**, et al. (2023). Halloysite Clay Nanotube Composites as Coating Materials with Enhanced Properties. *Construction and Building Materials*, 392. doi:10.1016/j.conbuildmat.2023.131961

Sharma, R., Seetala, N., Clower, W., Alam, S., **Gordon, S.**, et al. (2022). Synergistic Effect of Mill Scale and MoS₂ in Geopolymer Composites for EMI Shielding Application. *Journal of Materials Science: Materials in Electronics*, 33. doi:10.1007/s10854-022-08823-4

Under Review

Gordon, S., Alam, S., Chakma, T., et al. (under review). Investigation of Electrical Conductivity and Mechanical Strength of Geopolymer Paste for 3D Printing via Ohmic Curing. Ain Shams Engineering Journal.

Peer-Reviewed Conference Proceedings

Gordon, S., Chakma, T., Hesser, M., et al. (2024). Styrene Emission Evaluation: An Innovative Controlled Test Setup. NASTT No-Dig Conference, Providence, RI.

Chakma, T., **Gordon, S.**, Alam, S., & Matthews, J. (2024). Exploring Rapid Solidifying Fly Ash Cementitious Materials for Making Structural Components. World of Coal Ash Conference, Grand Rapids, MI.

Book Chapter

Alam, S., **Gordon, S.**, Bassett, B., et al. (2025). Three-Dimensional Printing of Fly Ash-Based Geopolymer Materials. In M. Kioumarsis & B. Shafei (Eds.), Lecture Notes in Civil Engineering (Vol. 237, pp. 13–24). Springer. doi:10.1007/978-3-031-69626-8_2

CONFERENCE PRESENTATIONS & ACADEMIC ENGAGEMENT

- Presenter, NASTT No-Dig Conference (2022, 2023, 2024)
- Presenter, World of Coal Ash Conference, Grand Rapids, MI (2024)
- Presenter, International Net-Zero Future Conference, Oslo, Norway (2024)
- Competitor, Conference of Southern Graduate Schools (CSGS) 3-Minute Thesis Competition (2024)

HONORS AND AWARDS

First Place - Louisiana Tech University 3-Minute Thesis Competition (2023)

First Place (2022), Third Place (2023, 2024) - NASTT Student Poster Competition (2022-2024)

Argent Memorial Scholarship, NASTT; South Central NASTT Student Scholarship (2023)

Third Place - Louisiana Tech Graduate Student Research Symposium Poster Competition (2024)

Dean's List - Louisiana Tech University (2020)

“Shoot for the Moon” Award, Engineering Freshman Design Expo (2017)