Roy Uzoma Lan, Ph.D., PMP
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My research interest spans AI in construction, construction safety, emerging technologies in construction, with a focus on field-ready decision support. My work has been presented at prominent academic and industry conferences and has been recognized with awards from leading organizations, including the American Society of Civil Engineers (ASCE) and the Associated Schools of Construction (ASC), and highlighted in media outlets such as UTSA News.

EDUCATION

Doctor of Philosophy, Civil Engineering (4.00/4.00) August 2025
The University of Texas at San Antonio, Texas
Dissertation: Advancing Workplace Safety Through Intelligent Monitoring: Applications of Artificial Intelligence and Computer Vision in High-Risk Industrial Environments
Area of Concentration: Artificial intelligence in Construction, Safety Applications
Advisor: Ibukun Gabriel Awolusi, Ph.D.

Relevant Course Work: Computer Vision: **A+,** Artificial Intelligence **A+,** Geographic Information Systems (GIS): **A+,** Building Information Modelling (BIM): **A**, Cost Estimating: **A**, Project Scheduling **(P6, MS Project**): **A,** Project Risk Management**: A**

Master of Science, Construction Management (Distinction) Nov 2021
University of Lagos, Akoka, **CGPA:** 4.79/5.00; Best Graduating Student.
Advisor: Olumide Adenuga, Ph.D. FNIOB, R.BLDR
Dean, Faculty of Environmental Science
Area of Concentration: Construction Management
Thesis: Empirical modeling of causal interactions and stakeholder influence in construction project outcomes.

Bachelor of Science, Civil Engineering June 2015
Covenant University, Ogun State, Nigeria
Area of Concentration: Civil Engineering and Construction Management

ACADEMIC EXPERIENCE

Graduate Research Assistant 2022 - Present
Safety Innovation and Sustainable Infrastructure $(SI)^2$ Group
School of Civil & Environmental Engineering, and Construction Management.
The University of Texas at San Antonio

Graduate Teaching Assistant	2022- 2025
CSM 2143 Construction Materials and Testing (Class size ~ 45)	Fall 2022
CSM 2143 Construction Materials and Testing (Class size ~ 45)	Spring 2023
CE 2103 & CSM 3113; Surveying (Class size ~ 50)	Summer 2023
CSM 2143 Construction Materials and Testing (Class size ~ 45)	Fall 2023
CSM 2143 Construction Materials and Testing Construction Safety (Guest Lectures) (Class size ~ 70)	Spring 2024
CE 4543 Project design and construction management (Class size ~ 30)	Summer 2024
CSM 2143 Construction Materials and Testing (Class size ~ 45)	Fall 2024
CSM 2143 Construction Materials and Testing (Class size ~ 45)	Spring 2024

PROFESSIONAL EXPERIENCE

Graduate Research & Teaching Assistant (Ph.D.) — UTSA, **2022–2025**

- **Research**: Led Artificial Intelligence/Computer Vision safety projects (ECERI, SOFIS); built Python/PyTorch/OpenCV pipelines with pose estimation and fuzzy inference for context-aware, uncertainty-informed traditional scoring.
- **Data & Validation**: Planned UAV mission workflows (risk assessment, checklists, flight logs), ran human-in-the-loop labeling, and benchmarked model outputs against expert REBA ratings and field observations.
- Publications & Visibility: Published/presented across AIST, ASC, ASCE, ASEE, UESI; presented at CIB World Building Congress; work featured by UTSA News.
- **Teaching (GTA):** Supported/led labs and recitations in Construction Materials & Testing, Surveying, Estimating, and Safety; created rubrics and problem sets; mentored student teams; managed grading via Canvas LMS.
- **Industry & Service**: Liaised with partner sites for pilots, ran safety/toolbox briefings (JSA/JHA, PTW), organized workshops, and coached peers on CV code, dataset curation, and UAV ops.

Project Manager (Engineering Team Lead) 2019 - 2022

Jagsul Nigeria Limited, Lagos

- Led 5 engineers and 20+ craft across three capital projects; stayed within ~5% of plan using 15-min daily stand-ups, three-week look-ahead schedules in Microsoft Project (MSP), and a live constraint log in SharePoint/Excel with tracked Key Performance Indicators (KPIs).
- NISER Renovation (Government renovation project): Full scope/schedule/cost/quality. Instituted stop-work authority and a same-day resolution Kanban with Service Level Agreements (SLAs) and Power Automate alerts; issues tracked in Microsoft Planner; digitized safety observations via QR forms and Job Safety Analyses (JSAs) to maintain zero major incidents.
- **Multi-Story Residential Building**: Pulled approvals forward with a permit/submittal register in Excel + Power Query, pre-app meetings, and front-loaded shop drawings reviewed in Bluebeam Revu to prevent downstream delays.
- Planning & logistics: Synced materials to the look-ahead using Bills of Quantities (BOQs), a 3-quote vendor policy in SharePoint Lists, and Just-in-Time (JIT) deliveries; site laydown plans derived from AutoCAD to cut re-handling.
- Quality & technical control: Enforced Inspection & Test Plans (ITPs) with hold points; structured RFIs/redlines in BIM 360/Procore; weekly punchlists in Bluebeam Studio; field checks via Trimble total-station workflows; all driving lower rework and tighter QA/QC
- Commercials & stakeholders: Resolved client–contractor cost disputes through change-order entitlement analysis (baseline Scope of Work (SOW) vs. as-built, Time Impact Analysis (TIA) logs) and value-engineering (VE) workshops; maintained alignment with a one-page progress/cashflow dashboard in Power BI.

Selected tools: MSP, AutoCAD, Bluebeam Revu/Studio, BIM 360 or Procore, SharePoint/Lists, Power BI, Power Automate, Excel + Power Query, Trimble total-station workflows, QR-based field forms.

Structural Engineer /Project Engineer / Safety Engineer 2016 - 2019

Marine Platforms Limited (Oil and Gas infrastructural Services)

- Structural design & analysis: Drafted offshore details (suction piles, shackles) in AutoCAD; performed structural checks in Orion/STAAD.Pro with load cases for lift/transport/in-place; validated against API RP 2A and relevant DNVGL offshore standards; issued calculational notes and redlines for fabrication.
- Fabrication QA/QC: Reviewed shop drawings; enforced Inspection & Test Plans (ITPs); coordinated Nondestructive Testing (NDT) (UT/MPI) and dimensional control; closed Non-Conformance Reports (NCRs) via root-cause and corrective actions to keep rework low.
- HSE management: Ran Hazard Identification (HAZID) / Hazard and Operability (HAZOP) sessions; authored Job Safety Analyses (JSAs/JHAs); implemented Permit-to-Work (PTW) and SIMultaneous

OPerations (SIMOPS) controls; tracked leading QHSE indicators (audits, near-misses) to strengthen field discipline.

- Procedures & documentation: Wrote/approved method statements for deploying Christmas Trees (XT), jumpers, manifolds, and suction piles; produced lift plans and rigging studies; prepared Bills of Quantities (BOQs)/Material Take-Offs (MTOs); maintained revision control and transmittals.
- Pipeline project engineering: Project Engineer on Southern Swamp Sales Gas Evacuation Pipeline (SSSGEP); 34 km installation from Tunu Central Processing Facility (CPF) to EA Riser Platform; executed sea-fastening checks and in-place analyses; coordinated marine spreads, vendors, and offshore readiness.
- Site supervision: Oversaw vessel and yard activities; used punchlists and hold-point releases to ensure spec/tolerance compliance; verified as-builts and handed over test packs.

HONORS AND AWARDS

2025

- **Best Paper Award, CIB World Building Congress 2025, Purdue University, USA**
  Paper: "UAV-DL-Based Computer Vision Framework for Construction Worker Pose Estimation." The CIB WBC conference includes a global, peer-reviewed process screening multiple papers across few sessions in 2025, making category wins highly competitive.
- **American Society of Civil Engineers (ASCE), UESI Student Scholarship Award**
  Competitive scholarship from ASCE's Utility Engineering and Surveying Institute supporting student leaders to attend the UESI Pipelines Conference with funding and full admission. **Two-time recipient**
- **Graduate Student Research and Travel Support Award, The University of Texas at San Antonio**
  The University of Texas at San Antonio Competitive UTSA funding that recognizes impactful research presentations at major venues. **Three-time recipient**.

2024

- **Best Poster Award – 60th Annual Associated Schools of Construction (ASC) International Conference**
  Awarded first place at the poster presentation among international submissions.
- **Certificate of Presentation, First ASC Doctoral Forum**
  Awarded for presenting "Harnessing Computer Vision for Enhancing Safety Management in Construction and Other High-Risk Work Environments" at the flagship global platform for construction research.
- **Graduate Student Research and Travel Support Award**, The University of Texas at San Antonio
  Awarded to support travel and presentation at leading academic conferences, recognizing high-impact research contributions.
- **Association For Iron & Steel Technology (AIST), Certificate of Recognition**
  AIST is a 16,600-member global nonprofit advancing iron and steel technology.

2023

- **North American Society for Trenchless Technology (NASTT), Student Scholarship Award**
  Recognized for academic excellence and promising contributions to trenchless technology research.
- **American Society of Civil Engineers (ASCE), UESI Student Scholarship Award**
  Awarded for exceptional academic and professional promise in civil engineering and utility engineering.
- **Association For Iron & Steel Technology (AIST), Certificate of Recognition**
  Received for the paper "Digital Computer Vision for Safety Management in Steel Manufacturing," emphasizing automation and safety in industrial environments.
- **Graduate Student Research and Travel Support Award**, The University of Texas at San Antonio
  Supported travel to share research findings at top academic venues, underlining impactful

contributions.

2022

- **Graduate Teaching Assistantship and Research Award**, The University of Texas at San Antonio Recognized for academic merit and exceptional contributions to teaching and research excellence.
- **Best Graduating Student**, M.Sc. in Construction Management, University of Lagos

PEER-REVIEWED JOURNAL PUBLICATIONS

Graduated with distinction as top student in program cohort consisting of 40+ graduate students.

1. **Lan, R.,** Awolusi, I., and Cai, J. (2024). "Computer Vision for Safety Management in the Steel Industry." *AI*, 5(3), 1192-1215.
2. **Lan, R.,** Awolusi, I., and Cai, J. (2023). "Digital Computer Vision Technologies for Safety Management Applications in the Steel Manufacturing Industry." *Digital Transformations, Iron & Steel Technology.*
3. **Lan. R.,** Adenuga, O., and Awolusi, I. (2025). "Professionals' Perspectives on the Factors Causing Construction Project Failures in Developing Countries: A Case Study of Lagos Metropolis." *International Journal of Construction Management (IJCM).*
4. **Lan. R.,** Adenuga, O., and Awolusi, I. (2025). "Impact of Construction Project Failure on Key Project Stakeholders: Assessing the Perspectives of Professionals in Lagos Metropolis." *Construction, Economics, and Building.*

Journal Articles Under Review

5. **Lan, R**. and Awolusi, I. (2025). "The Elevated Construction Ergonomic Risk Index (ECERI): Contextualizing REBA for Height-Exposed Tasks" *Journal of Safety Research.*
6. **Lan, R**. and Awolusi, I. (2025). "Self-Organizing Fuzzy Inference for Uncertainty-Aware Ergonomic Risk Assessment." *Engineering Application of Artificial Intelligence.*
7. Esfahani, M., **Lan, R**., Awolusi, I., Taah, S., (2026). "Physiological Effects of Structured Heat Stress Prevention Interventions in Construction Workers Using Wearable Technology." *Building and Environment.*
8. **Lan, R**., Oyeyipo, T., Langar, S., and Awolusi, I. (2025). "BIM and Digital Twin for Construction Safety: A Review." *Automation in Construction.*

Peer-Reviewed Book Chapter

Lan, R., & Sulbaran, T. (2023). A review of computer vision-based progress monitoring for effective decision making. Proceedings of the 23rd International Conference on Construction Applications of Virtual Reality (CONVR 2023) (pp. 856–864). https://doi.org/10.36253/979-12-215-0289-3.85

Peer-Reviewed Conference Publications

1. **Lan, R.** and Awolusi, I., (2024). Integrating Wearable Sensing Devices and Computer Vision for Safety Management in Steel Mills. *Proc. Iron & Steel Technol. Conf.* 2024. **(AIST Certificate of Recognition**)
2. **Lan, R.,** Awolusi, I., and Cai, J. (2023). Computer Vision for Pipeline Monitoring Using UAVs and Deep Learning. *Pipelines* 2023, 181-191.
3. **Lan, R.,** Awolusi, I., and Cai, J. (2023). Digital computer vision for safety management in Steel manufacturing. Proc. Iron & Steel Technol. Conf. 2023, 31-42 **(AIST Certificate of Recognition**)
4. **Lan, R.** and Sulbaran, T. (2023). A Review of Computer Vision-Based Progress Monitoring for Effective Decision Making. *Proc. of the 23rd Intl. Conf. on Constr. App. of VR*, 856–864**.**
5. **Lan, R**., Awolusi, I. (2025). "UAV-DL-Based Computer Vision Framework for Construction Worker Pose Estimation." CIB World Building Congress, WBC2025 In *CIB Conferences* (Vol. 1, No. 1, p. 244).

(Awarded Best Paper at CIBWBC 2025 International Conference)

6. Okonkwo, C., **Lan R.,** Awolusi, I., Cai, J. (2025) "Integrating Artificial Intelligence Knowledge into Construction Education: A Case Study Application for Predicting Concrete Properties" *American Society for Engineering Education (ASEE) Gulf Southwest Conference.*
7. **Lan R.,** Okonkwo, C., Awolusi, I., Cai, J. (2025) "Incorporating Sustainability Knowledge into Construction Education Curriculum: A Case Study of Earthen Masonry" *American Society for Engineering Education (ASEE) Gulf Southwest Conference.*
8. Esfahani, M., **Lan, R**., and Awolusi, I. (2025). "Worker Perception and Physiological Responses to Heat Stress Prevention and Control Interventions in Construction" *ASCE International Conference on Computing in Civil Engineering.*

Conference Papers Under Review

9. **Lan, R**. and Awolusi, I. (2026). "Contextual Ergonomic Risk Amplification (CERA) Framework: A Novel Approach for Height-Exposed Construction Tasks" *Construction Research Congress*
10. **Lan, R**. and Awolusi, I. (2026). Weather-Integrated Computer Vision Framework for Real-Time Construction Safety Risk Assessment. *Construction Research Congress*
11. Esfahani, M., **Lan, R**., Awolusi, I., Taah, S., (2026). "Enhancing Real-Time Decision Making for Heat Stress Prevention in Construction using Wearable Sensing Devices." *Construction Research Congress*
12. Oyeyipo, T., **Lan, R.,** Awolusi, I., Schultz, A., Laefer, L., Al-Sabah, S. (2026). Pose Estimation for Ergonomic Risk Assessment in Steel Connection Tasks. *Construction Research Congress*
13. Falomo, O., **Lan, R**., Awolusi, I., Schultz, A., Cai, J., Du, A. (2026). Framework for Managing and Sharing UAS-Acquired Data in Transportation Infrastructure Monitoring. *Construction Research Congress.*

Manuscripts In Progress

1. **Lan, R**. and Awolusi, I. (2025). "Computer Vision Adoption and Implementation for Safety and Health in the Construction Industry." *Technology in Society.*
2. **Lan, R.** and Awolusi, I. (2025). **"**UAV Path Optimization for Maximum Safety Coverage". *Automation in Construction.*
3. **Lan, R**. and Awolusi, I. (2025). "Worker Protection or Worker Surveillance? The Privacy-Performance Paradox in Construction Safety." *International Journal of Information Management*
4. **Lan, R**. and Awolusi, I. (2025). "Strategic Pathways: Mapping the Future Evolution and Implementation of Computer Vision in Construction Safety." *Journal of Strategic Information Systems.*

INVITED SPEAKING PRESENTATIONS

1. "Harnessing Computer Vision for Enhanced Safety Management in Construction and other High-Risk Work Environments." 60th Annual Associated Schools of Construction International Conference, April 3 – 5, 2024, Auburn, Alabama. USA
2. "Integrating Wearable Sensing Devices and Computer Vision for Safety Management in Steel Mills ". The Association for Iron & Steel Technology (AISTech) Conference and Exposition, Columbus, OH, May 6-9, 2024.
3. "Digital computer vision for safety management in Steel manufacturing." Association for Iron & Steel Technology AISTech 2023 Conference May 8 – 11, 2023, Detroit, Michigan. USA
4. "Computer Vision for Pipeline Monitoring Using UAVs and Deep Learning" American Society of Civil Engineers Utility Engineering & Surveying Institute, Pipelines 2023 Conference August 12 – 16, 2023, San

Antonio, Texas, USA

5. Guest Lecture at The University of Texas at San Antonio; Topic on Construction Safety – Focus Four Hazards to Construction Science and Management (CSM) Graduate and undergraduate students
6. "A Review of Computer Vision-Based Progress Monitoring for Effective Decision Making" The 23rd International Conference on Construction Applications of Virtual Reality (CONVR2023) November 13 – 16, 2023, Florence, Italy.

RESEARCH POSTER PRESENTATIONS

1. UAV and DL-Based Computer Vision for Pose Estimation of Construction Workers, 60th Annual Associated Schools of Construction International Conference, Auburn, AL, USA 3-5 April 2024. **(Awarded Best Poster)**
2. Integrating Wearable Sensing Devices with Computer Vision for Hazard Identification in Steel Mills, AISTech 2023, Detroit, MI, USA 8-11 May 2023.
3. Context Matters: ECERI Extends REBA for Elevated Construction Work. Graduate School Appreciation Week (GSAW), UTSA, Texas. 14 April 2025.

GUEST LECTURE/PRESENTATION

Lan, R. (2023). "OSHA Focus Four Hazards – Caught-In-Between." Invited lecture at CSM 4623: Construction Safety, Instructor: Dr. Ibukun Awolusi, The University of Texas at San Antonio, February 16, 2023.

TECHNICAL REPORTS

Awolusi, I., Jiannan, C., and **Lan, R.,** (2023). "Digital Computer Vision Technologies for Safety Management in Steel Manufacturing." Final Report, Digital Technologies for Steel Manufacturing Grant, Association for Iron & Steel Technology (AIST) Foundation.

RESEARCH GRANTS

Digital Computer Vision Technologies for Productivity and Safety Management in Steel Manufacturing.
(2022-2023)
Sponsor: Association for Iron & Steel Technology (AIST) Foundation
Role: Lead Graduate Research Assistant

- Conducted extensive literature reviews to identify critical gaps in computer vision applications for safety and productivity in steel manufacturing.
- Designed, developed, and tested a computer vision application for detecting safety helmets and characterizing steel-related hazards in a minimill environment, enabling automated hazard identification and improved safety protocols.
- Compiled findings and presented results at a major industry conference, with outcomes later published in a peer-reviewed journal article.

Gaze-directed UAV-UGV Coordination Framework for On-site Quality Inspection of Precast Bridge Construction
(2024-2025)
Sponsor: Transportation Infrastructure Precast Innovation Center (TRANS-IPIC)
Role: Graduate Research Assistant

- Assisted in UAV flight operations to capture high-resolution imagery for bridge quality inspection.
- Contributed to data collection and analysis to assess the alignment and integrity of precast components.

- Supported planning and execution of UAV–UGV coordination, including equipment setup and workflow optimization for efficient data capture.
- Helped advance methodologies integrating UAVs and UGVs for automated, accurate on-site quality inspection

JOURNAL REVIEWER INVITATIONS

1. Journal of Manufacturing Process
2. Journal of Building Engineering
3. Frontiers in Built Environment Journal
4. Automation in Construction
5. Journal of Construction Economics and Building.

SERVICE AND LEADERSHIP EXPERIENCE

- **Klesse College of Engineering Emerging Student Leader (2024 – 2025):** distinguished as one of the top 10 students selected from a college of over 4,000+ students for a prestigious, year-long program, intended to provide intensive training and direct mentorship with senior faculty and industry executives to cultivate the next generation of engineering leaders.
- **Student Volunteer, Meals on Wheels, San Antonio, Texas (2023 – 2025):** Regularly deliver meals and provide support to senior citizens and individuals in need, demonstrating a strong commitment to community service and care for vulnerable populations.
- **Student Volunteer, Acts of Hope, San Antonio (2023 – 2024):** Engaged in various community outreach efforts, including organizing donation drives and assisting in programs aimed at supporting underserved communities.
- **Volunteer, Goodwill Foundation, San Antonio, Texas (December 2023):** Participated in initiatives to support individuals in need by providing essential resources and job training opportunities through the Goodwill Foundation.
- **Session Monitor, AISTech 2023 Conference, Detroit, Michigan (May 2023):** Played a key role in ensuring the smooth operation of sessions at the AISTech conference, showcasing organizational and leadership skills in an international professional setting.
- **General Secretary, International Student Association (ISA) (February 2023 – 2024**): As General Secretary, contributed to organizing events, promoting cultural exchange, and providing a support system for international students at the University of Texas at San Antonio, further developing my leadership and administrative abilities.
- **Author of "My Nigerian Dream"**: Authored and published a book in collaboration with non-governmental organizations (NGOs), distributing copies to high school and college students to promote the values of hard work, grit, and excellence. This initiative showcases my commitment to mentorship and inspiring the next generation of leaders.

MEDIA

- Klesse College of Engineering & Integrated Design, UTSA News Feature:
  CIB Best Paper Award – UTSA Research Recognition (July 2025)

STUDENT MENTORSHIP

- Mentored three high school graduates from minority and diverse groups, introducing them to emerging technologies such as artificial intelligence in construction and computer vision algorithm debugging. (2024)
- Speaker and Judge at Klesse engineering student progams; providing free knowledge of emerging technologies to Fresh men in SI group (2025)

PROFESSIONAL CERTIFICATIONS

- Project Management Professional (PMP) 2025
- 30-hour OSHA Construction Safety and Health Course 2023
- Basic Offshore Safety Induction and Emergency Training 2022
- Supply Chain & Logistics Management 2018
- Entrepreneurship and Innovation – City and Guilds of London Institute 2018

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- American Society of Civil Engineers (ASCE)
- American Society of Engineering Education (ASEE)
- American Society of Safety Professionals (ASSP)
- National Society of Black Engineers (NSBE)
- Association for Iron & Steel Technology (AIST)

TECHNICAL SKILLS

- Productivity Tools: Microsoft Office Suite (Word, Excel, PowerPoint, Outlook), Jira,
- Construction Tech Revit, AutoCAD, BIM 360, Primavera P6, MS Project
- Computer-Aided Design & BIM: AutoCAD, Revit, AutoCAD Civil 3D, SolidWorks (taught and certified)
- Project Management: Agile, Scrum, PMP-certified, Jira, risk management
- Programming : Python, MATLAB, SQL
- Structural Analysis & Design: STAAD.Pro, Tekla Structures, ORION
- Cost Estimating & Management: On-Screen Takeoff, Quick Bid
- Data Science: NumPy, Pandas, Matplotlib, data preprocessing, feature engineering