ANTO OVID G S

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Education

North Carolina State University, *PhD and MS in Civil Engineering* | Raleigh, NC, USA | GPA: 3.9/4.0 — Jan'22 - Dec'25

- **Coursework:** BIM, CII, Construction Project Management, Risk & Financial Management, Safety Management.

North Carolina State University, *MS in Electrical and Computer Engineering* | Raleigh, NC, USA — Jan'24 – Dec'25

- **Coursework:** Neural Networks, Meta-heuristic Algorithm, Nano-microsensors, Wearable Biosensors

Anna University, *B.Tech in Civil Engineering* | GCT - Coimbatore, TN, India | CGPA: 3.46/4.0 — Jun'15 - May'19

- **Coursework:** Structural Analysis, Design-RCC, Steel, Soil mechanics; Highway Design; CPM and Programming.

Current Research Projects (Manuscripts in Preparation for Journal Publication - Dr. Albert Research Group, NCSU)

OSHA Workplace Injury Data Analysis — Dec'22 – Apr'23

- Conducted a comprehensive statistical analysis of OSHA injury data to uncover correlations among injury sources, event types, and injury characteristics in the construction, mining, and manufacturing sectors.
- Research focusing on Specialty trade workers, Hand injuries in the construction sector, Equipment, and vehicle-related accidents.
- Prepared and submitted analytical reports along with six draft manuscripts for internal review.

Proactive Task Safety Analysis using NLP — Dec'23 – Jun'24

- Developed a Python-based web application utilizing advanced Transformer models to generate task-specific safety insights.
- Currently preparing a draft manuscript for publication.

ConSafeGPT: Finetuning a LLM for Construction Safety — Dec'24 – Present

- In the process of developing an industry-specific large language model by fine-tuning open source LLMs on a corpus of construction safety data.
- Established the overall framework and initiated dataset curation through manual verification for subsequent fine-tuning.

Unreal Worksite Training: A Real-Time MR, BIM & GPT-Based Training System — Jan'25 – Present

- Developing an integrated training framework that combines large language models, mixed reality (MR), and Building Information Modeling (BIM) data within a game engine to enhance worker training, productivity, and on-site safety.

Graduate Research Experience

Applied AI and Robotics for Construction Operations—A Smart Review of the State of the Science — Dec'23 – Mar'24

- Conducted a systematic review of academic articles on AI, robotics, and IoT in the construction industry, analyzing their applications across construction phases.
- Used semi-supervised and unsupervised machine learning to classify and analyze articles for insights on improving construction efficiency and safety.
- Identified barriers, benefits, and the impact of automation on productivity, safety, and job opportunities in the construction sector.

Meet2Mitigate: An LLM-based RAG Application for Construction Meetings — Dec'23 – Mar'24

- Collaborated with the team and developed a Retrieval-Augmented Generation (RAG) framework LLMs to summarize and extract actionable insights from project and safety meetings.
- Experimented with multiple LLMs and evaluated their performance for the construction meeting summarization

Construction Hazard recognition and safety training using ChatGPT.

- Conducted an experimental Study on construction students to assess ChatGPT's impact on hazard recognition skills.
- Assisted in creating pre- and post-intervention evaluations to measure hazard recognition improvements and performed statistical analyses to determine ChatGPT's effectiveness.
- Incorporated ChatGPT into the curriculum, provided guidance on its application for hazard identification, and evaluated its potential as a safety training tool.

Assessment of ChatGPT, as an educational resource for civil engineering students.

- With the team designed and conducted a controlled Study to assess ChatGPT's impact on learning outcomes in Construction Surveying and Geomatics.
- Created pre- and post-intervention questionnaires to evaluate knowledge gains and gather student perceptions of ChatGPT's usability.
- Performed statistical analyses to determine the effectiveness of ChatGPT as an educational tool, resulting in a peer-reviewed publication.

Graduate Teaching Experience

Instructor Fall'23 & Spring'24

- CE 301 - Surveying Laboratory (Fall'23, and Spring'24)

Teaching Assistant Fall'22 - Spring'25

- CE 365 - Construction Equipment Methods (Spring'25)
- CE 464/564 - Legal Aspects of Contracting (Spring'25)
- CE 466 - Building Construction Engineering (Fall'22, Fall'23, Fall'24)
- CE 301 - Surveying Laboratory (Fall'22, Spring'23)

Refereed Publications

Ovid, A., Alsharef, A., Jamil Uddin, S. M., & Albert, A. Applied AI and Robotics for Construction Operations—A Smart Review of the State of the Science. In Construction Research Congress 2024 (pp. 913-923).

Uddin, S. J., Albert, A., **Ovid, A.**, & Alsharef, A. (2023). Leveraging ChatGPT to aid construction hazard recognition and support safety education and training. Sustainability, 15(9), 7121.

Uddin, S. J., Albert, A., Tamanna, M., **Ovid, A.**, & Alsharef, A. (2024). ChatGPT as an educational resource for civil engineering students. Computer Applications in Engineering Education, e22747.

Chen, G., Alsharef, A., **Ovid, A.**, Albert, A., & Jaselskis, E. (2025). Meet2Mitigate: An LLM-powered framework for real-time issue identification and mitigation from construction meeting discourse. Advanced Engineering Informatics, 64, 103068.

Alsharef, A., **Ovid, A.**, Jamil Uddin, S. M., & Albert, A. Biggest Challenges Facing the Construction Industry. In Construction Research Congress 2024 (pp. 652-660).

Jamil Uddin, S. M., Tabassum, N., **Ovid, A.**, Alsharef, A., & Albert, A. Measuring Mental Fatigue in Construction: State of the Science and Future Opportunities. In Construction Research Congress 2024 (pp. 688-698).

Alsharef, A., Jamil Uddin, S. M., Banerjee, S., **Ovid, A.**, & Albert, A. Information Sources and Lessons Learned by Construction Organizations during the Early Months of the COVID-19 Pandemic in the US. In Construction Research Congress 2024 (pp. 671-679).

Jamil Uddin, S. M., Tamanna, M., Alsharef, A., **Ovid, A.**, & Albert, A. Workforce Challenges Posed by the COVID-19 Pandemic: YouTube as a Data Source. In Construction Research Congress 2024 (pp. 170-179).

Professional Experience

DPR Construction, Raleigh-Durham, NC, *BIM/VDC Intern* Sep'22 – Dec'22

- Monitored a pharmaceutical facility's construction, captured progress via Drone deploy and Structionsite.
- Updated tasks daily task using Autodesk Assemble and BIM 360.
- Created interactive dashboards in PowerBI and Unity3D AR apps for project reporting and clash visualization.
- Supported BIM coordination meetings with clash detection in Navisworks, and assisted the on-site team with 4D BIM modeling using Synchro Pro.
- Led the NCSU Project team to assess the effectiveness of using 4D BIM technologies in a life science project.
- Developed immersive BIM meeting tools using Mixed Reality Tool Kit MRTK, Unreal Engine 5, and HoloLens2.

Fresco Structures, India, *Co-Founder/ Project Engineer; BIM,Structural and AI-ML Tutor* Aug'19 – Dec'21

- Co-founded the non-profit organization to aid students in need.
- Designed and constructed multiple residential and commercial projects, leading teams multidisciplinary teams.
- Delivered BIM services for several clients, including structural design, cost estimation, and project visualization using Revit, Navisworks, and Tekla.
- Creating free lecture materials on BIM, Structural analysis & design, Soil mechanics, Vector calculus, Intro to Ai/ML, Python for civil engineers

Cubik CADD, India, *Part time – Civil Software Trainer* Nov'19 – Apr'21

- Taught civil software courses for students, including AutoCAD, Revit, Navisworks, Synchro 4D, and STAAD.Pro.

Swifterz Creative Services, India, *Structural Designer and BIM Modeler* Jan'19 – Jul'19

- Designed projects from Architectural CAD drawings using STAAD.pro and MS Excel.
- Built 3D models in Revit and performed clash detection, quantity, and cost estimations in Navisworks and Synchro.
- Worked on projects including Medical College hospital, hostels, and apartments.
- Assisted the IT team to develop add-ins for Revit using python and Dynamo.

Projects

Constructability Review on NCDOT I-40 Highway | NCDOT Mar'22

- Reviewed constructability issues in the NCDOT I-40 project involving highway extension and upgrades.
- Identified major productivity issues such as utility relocation, traffic control, and land acquisition challenges.
- Performed traffic analysis simulation in Autodesk Infraworks.
- Proposed solutions including pre-construction engineering meetings, improved communication, and the use of GIS to predict utility clashes.
- Analyzed the potential impact of weather, safety problems, and materials wastage on project delays and costs.

Wearable Bio-Sensor for Monitoring Construction Worker Safety Dec'23

- Developed a wearable hand-arm sleeve to monitor worker exposure to vibration and muscle fatigue.
- Incorporated a 3-axis MEMS accelerometer and EMG electrodes for real-time monitoring of Hand-Arm Vibration Syndrome (HAVS) and musculoskeletal disorders (MSDs).
- Designed the device to transmit data via Bluetooth to a companion app for trend analysis and immediate feedback.

Mathematical Programming using Python and MATLAB Apr'21

- Coded Genetic Algorithm, Particle Swarm Optimization, and Firefly Optimization algorithms.
- Programmed and solved Linear Programming transportation problems and Principal Component Analysis (PCA) problems.
- Implemented the fourth-order Runge-Kutta method using a Prey-Predator system as an example.
- Programmed numerical root finding techniques such as Secant, Newton-Raphson, and Bisection methods.
- Solved numerical computations involving Eigenvectors, Eigenvalues, Numerical Integration, and Ordinary Differential Equations (ODEs).

Finite Element Analysis using MATLAB FEM Codes and ANSYS Scripts Apr'21

- Imported ANSYS models into MATLAB's Partial Differential Equation toolbox for structural analysis using FEM.
- Performed static structural analysis on 1D, 2D, and 3D solid elements using ANSYS scripts.
- Compared Finite Element Analysis (FEA) results of Trusses, 2D Plates, and 3D Solid elements between MATLAB FEM Code and ANSYS scripts.

Automation in Construction Design using PyAutoCAD and RevitPythonShell Feb'21

- Coded Python snippets for the design and visualization of concrete footings, beams, and columns.
- Automated beam design in AutoCAD using PyAutoCAD, streamlining the process for engineering teams.
- Developed Python code for reinforced concrete beam analysis, calculating and visualizing shear force, bending moment, and deflection diagrams using Matplotlib.
- Modeled 3D concrete beams and visualized reinforcement detailing with a 3D scatter plot using Python.

Skills & Tools

Analysis & Design:	AutoCAD, Civil 3D, Robot; STAAD.pro; CSI-ETABS, SAP2000, SAFE; Tekla SD, Midas.
FEA - Simulation:	Ansys, Abaqus; Plaxis 3D
Heavy Civil / Infrastructure:	Infraworks, Openroads; QGIS. Csi-Bridge, Leap Bridge (Concrete & Steel); MX-Roads.
BIM/VDC & Management:	Revit, Navisworks, Synchro Pro; MS Office, Primavera P6, Autodesk Assemble, BIM 360.
Data Visualization:	PowerBi, Tableau, Python - Matplotlib; Plotly, MS Excel.
Architectural Visualization [AR, VR]:	Unreal Engine, Unity 3D; Lumion, Twinmotion; Photoshop and Illustrator.
Parametric & Generative Design:	Fusion 360; Dynamo, Grasshopper; PyAutoCAD, PyRevit.
Programming & IoT:	C, C++, Python, Julia, MATLAB, R*, ROS*; Arduino, Raspberry Pi 4.
Languages:	English, Tamil, Spanish*.

Certifications and Associations

Licenses -	Autodesk Certified Professional: AutoCAD, Revit, 3DS Max, Generative Design-Fusion 360.
NPTEL -	RC-Road Bridge, Special Concretes, Repair of Concrete Structures, PSO/GA - Non-Traditional and Traditional Optimization Tools, Project Planning and Control.
Coursera -	3D Printing, Deep Learning and Neural Networks, Math for ML, MATLAB Programming.
LinkedIn Learning -	Algorithmic & Generative Design (Dynamo and Grasshopper), AR/VR-Unreal Engine, Construction Management, Infraworks, Synchro, Power BI, Sustainability (GBS: Energy Analysis).
Associations -	President - Construction Management Association of America (CMAA), Student Chapter at NCSU; Student Member of American Society of Civil Engineers (ASCE); Helping Hand Project (HHP).

Honours

1st Place in Preconstruction Student Competition, *ASC Region 2 South East* Nov'22

Led NCSU's Tuffy construction team to win first place in the Preconstruction Bid Simulation competition at the 2022 ASC Region 2, sponsored by Brasfield & Gorrie.