Mohamed Sabek

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Languages: Fluent in English and Arabic

Professional Summary

PhD Candidate in Construction Management at the University of Alberta, specializing in computer vision, AI, and language model applications for construction safety, monitoring, and resource optimization. Founder of VisioConTech, an AI-driven real-time monitoring system incubated at the University of Alberta. Recipient of multiple awards, scholarships, and certifications (PMP, RMP). Published in leading conferences (CSCE, IGLC, ISARC, ASEE, IEEE ICRA) and journals (Automation in Construction). Experienced in fine-tuning large language models (LLMs) and vision-language models (VLMs) for construction industry applications, including automated grading systems and contract sustainability evaluation. Active in leadership, teaching, and community service, with over 7 years of professional experience as a civil engineer and project manager.

Education

University of Alberta, Canada

PhD in Construction Management and Technology (2023–Present)

- Dissertation: Optimizing Resource Allocation in Construction Projects Through Automated Computer Vision Monitoring Systems

- Scholarships: PhD Graduate Recruitment Scholarship; Alberta Innovates Graduate Student Scholarship

University of South Wales, UK

MBA (2022–2023)

Arizona State University, USA

MSc in Construction Management and Technology (2020–2022) – First Class Honors (GPA 4.0/4.0)

- Thesis: A Performance Study of Different Deep Learning Architectures for Detecting Construction Equipment on Sites

Prince Sattam Bin Abdulaziz University, Saudi Arabia

BSc in Civil Engineering (2011–2016) – Second Class Honors (GPA 4.38/5.00)

Research and Publications

Peer-Reviewed Journal Articles

Salhab, D., Sabek, M., Pourrahimian, E., Gonzalez-Moret, V., & Hamzeh, F. (in press). Bridging perception and decision-making: An integrated computer vision and fuzzy system for construction workspace management. Automation in Construction.

Conference Papers

2025

- Sabek, M., Ammar, B. A., Hammad, A., Hamzeh, F., & Gonzalez, V. (2025). Automated sustainable evaluation for construction contracts using machine learning. CSCE & CRC Conference, Montreal.
- Sabek, M., Ammar, B. A., Hamzeh, F., & Gonzalez, V. (2025). Immersive safety: Revolutionizing construction training with virtual reality and behavioral insights. CSCE & CRC Conference, Montreal.
- Liu, K., Sabek, M., Gonzalez, V., Lee, G., & Kinateder, M. (2025). Digital twin–based construction fire hazard recognition training system. 42nd ISARC, Montreal. http://dx.doi.org/10.22260/ISARC2025/0139
- Sabek, M., Mei, Q., Lee, G., Golabchi, A., & Gonzalez, V. (2025). Construction Industry Vision Alberta Dataset (CIVAD). 42nd ISARC, Montreal. http://dx.doi.org/10.22260/ISARC2025/0124
- Mowafy, A., Talebi-Kalaleh, M., Sabek, M., et al. (2025). Automated grading of engineering statics assignments using large language models and computer vision. ASEE Annual Conference, Montreal. (Under Review)

2024

- Sabek, M., Gonzalez, V., Mei, Q., & Lee, G. (2024). Enhancing Construction Site Safety and Efficiency with YOLO v8-Based Computer Vision Model. CSCE Annual Conference, Niagara Falls. http://dx.doi.org/10.1007/978-3-031-97697-1
- Sabek, M., Gonzalez, V., Mei, Q., & Lee, G. (2024). Improving Tomorrow’s Construction Sites Safety and Efficiency with YOLO v8. Poster, IEEE ICRA, Yokohama.
- Wang, Z., Sabek, M., Wu, Y., Mei, Q., Lee, G., & Gonzalez, V. (2024). Digital Twin-Based Integrated Decision Support System. 32nd IGLC, Auckland. https://doi.org/10.24928/2024/0117

2022

- Ciaglia, F., Zuppichini, F. S., Sabek, M., et al. (2022). Roboflow 100: A Rich, Multi-Domain Object Detection Benchmark. arXiv. https://doi.org/10.48550/arXiv.2211.13523
- Sabek, M. (2022). A Performance Study of Different Deep Learning Architectures for Detecting Construction Equipment on Sites. MSc Dissertation, Arizona State University. https://hdl.handle.net/2286/R.2.N.168625

2015–2014
- Sabek, M. (2015). Monitoring Urban and Land Use Changes Using Remote Sensing and GIS: A Case Study of Al-Kharj Region. 10th GIS Symposium, Saudi Arabia.
- Sabek, M. (2014). A Study of Effective Design for Water Heaters Using Cavitation Fusion. PSAU Scientific Conference, Saudi Arabia.

Research Impact & Societal Contribution

- Safety Improvement: Developed VisioConTech, an AI-driven monitoring system, reducing risks of accidents and improving compliance with safety protocols.
- Economic Savings: Research demonstrates potential cost savings of $350,000 annually per construction site by reducing reliance on manual supervision.
- Sustainability: Co-authored work on machine learning approaches for sustainable contract evaluation, supporting greener construction practices.
- Education Innovation: Applied LLMs, VLMs, and computer vision in automated grading systems, enhancing assessment efficiency in engineering education.
- Open Data Contribution: Led the development of the Construction Industry Vision Alberta Dataset (CIVAD), one of the most extensive construction-specific datasets (120,000+ images).

Academic and Professional Experience

Research Assistant, University of Alberta (2023–Present)
- Conducts advanced research on AI-based monitoring for construction.
- Leads dataset creation (CIVAD, 120k+ images).
- Published in CSCE, IGLC, ISARC, and ICRA.

Teaching Assistant, University of Alberta (2023–Present)
- ENGG 130: Engineering Mechanics (Lab TA).
- CIV E 409: Construction Methods (Marking TA).
- CIV E 270: Mechanics of Deformable Bodies (Help Desk TA).
- CIV E 602: Contract Administration (Head TA).

Project Manager & Civil Engineer, Wadi Serga Est., Saudi Arabia (2016–2023)
- Supervised 12+ projects ($30M+).
- Led infrastructure design and geotechnical investigations.
- Implemented cost and risk management strategies.

Awards and Scholarships

- APIC Energy Hackathon – 1st & 2nd Prize (2025)
- Alberta Innovates Graduate Student Scholarship – CAD 31,000 annually (2024–2027)
- Mitacs Lab2Market Funding for VisioConTech – CAD 15,000 (2024–2025)
- AWS Wildfire Evacuation Hackathon – 1st Place, CAD 200 (2024)
- CIC’s ELEVATE Competition – 2nd Place, CAD 2,000 (2024)
- CSCE People’s Choice Award – Graduate Poster, CAD 200 (2024)

- Pitchfork Changemaker Award, Arizona State University (2024)
- PhD Graduate Recruitment Scholarship – CAD 5,000 (2023)
- Al Ghurair Open Learning Scholarship – USD 35,000 (2020–2022)
- Best Undergraduate Civil Engineer in Training, Alsafi Co. (2016)
- Best Undergraduate Research Paper Awards (2012, 2014, 2015)

Leadership, Service, and Volunteering

- Chief Faculty Steward, GSA Labour Relations Committee (2023–Present)
- GSA Councillor-at-Large, University of Alberta (2023–Present)
- Board Member, OSPF (Edmonton, 2023–Present)
- Volunteer, Canadian Engineering Education Association Conference (2024)
- Co-Founder, Egyptian Sun Devils Club, Arizona State University (2020–2022)
- Conference & Journal Reviewer – ISARC, IGLC, Eureka Journal (2023–Present)
- Committee Member, CSCE Engineering Management Technical Committee (2025–2027)

Certifications and Memberships

- Project Management Professional (PMP)
- Risk Management Professional (RMP)
- Member: CSCE, ASCE
- Licensed Engineer: Egyptian and Saudi Syndicates

Technical Skills

- AI & Computer Vision: YOLO,RFTD, Detectron2 , TensorFlow, PyTorch
- LLMs & VLMs: Fine-tuning and applying large language and vision-language models for automated grading, sustainability assessments, and decision support in construction
- Programming & Data: Python, R, SQL, Power BI, Matplotlib
- GIS & Remote Sensing: Advanced analysis, urban planning, land use change detection
- Software: Revit, AutoCAD, Robot Structural Analysis, Microsoft Office